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The Economic and Psychosocial Effects of COVID-19 on Alcohol Use in Grenada during Lockdown: A Discussion on Policy Solutions to Prevent Harmful Alcohol Consumption



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ABSTRACT: In Latin America and the Caribbean (LAC) region, there has been an increase in alcohol consumption during the COVID-19 pandemic period. The institution of lockdowns and consequent alcohol misuse has been associated with economic challenges and worsening psychosocial conditions. Stress-inducing changes in interpersonal, financial, and broader social dynamics have resulted in increased reports of depression, interpersonal abuse, aggressive behaviours, anxiety, and even suicidality, leading those affected to more frequent and more heavy alcohol use as a coping mechanism. This review focused on trends of alcohol use during the pandemic in Grenada, and it also explored the economic and psychosocial factors that contributed to adverse outcomes of alcohol use. In response to the destructive coping strategies associated with deteriorating mental health, the paper also proposed vigorous policy changes to mitigate the ongoing misuse of alcohol, particularly during future crises. Library databases, webpages of various governments and international agencies, and peer-reviewed journal sources were searched for data on global alcohol consumption during the 2020-2021 COVID-19 lockdown periods, focusing on Grenada. A total of 64 sources published between 1979-2021 were included based on their relevance. The COVID-19 pandemic has highlighted the importance of building resilient public health systems and addressing public health concerns such as excessive alcohol consumption.

KEYWORDS: Alcohol use, alcohol consumption, Grenada COVID-19 lockdown, healthcare resources, economic issues, psychosocial concerns, health policy, policy implications

INTRODUCTION

Alcohol is associated with significant mortality, and morbidity secondary to its higher-than-average consumption levels in the Americas compared to the rest of the world (Pan American Health Organisation [PAHO], 2020). Alcohol is also implicated in weakening the immune system, diminishing quality of life, and lowering life expectancy. Indeed, heavy alcohol consumption increases susceptibility to various infections and complications, as with COVID-19 and the associated acute respiratory distress syndrome (PAHO, 2020). Alcohol consumption also contributes to intensified risky behaviour and disease states that worsen the quality of life, including obesity, diabetes, and hypertension. An increase in drinking also exacerbates health spending, reduces employment, lowers educational outcomes, and decreases overall productivity (Organisation for Economic Co-operation and Development [OECD], 2021). More broadly, alcohol abuse has been associated with behaviour leading to increased injury, including motor vehicle accidents and various forms of violence (OECD, 2021).

There is a sequela of alcohol misuse that has always existed globally. As the pandemic has evolved, however, there has been an increase in domestic abuse, aggressive behaviour, and child abuse and neglect, of which heavy drinking is a predisposing risk factor (OECD, 2021). These findings were evidenced by a study that identified a rise in domestic violence and an increased risk of harm to children or self that were associated with increased alcohol consumption (Ramalho, 2020). As a result of lockdowns and social distancing measures and a subsequent shift of drinking behaviours from social settings to inside the home, there was also an increase in drinking in the presence of children (Garcia-Cerde et al., 2021). Frequent parental alcohol consumption may undermine the negative consequences of its use while enhancing its positive aspects, leading to the early initiation of alcohol consumption in teenage children (Garcia-Cerde et al., 2021).

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Regarding accessing health care resources and rehabilitation, these data make alcohol a considerable risk factor for worsening the burden of any health care system. Despite alcohol's use as a relaxation method to counter the pandemic's stressors, alcohol consumption increases the risk of contracting SARS-CoV-2. Those living with a mental illness are particularly vulnerable to psychological decline, especially in the context of social distancing and, in some cases, isolation (Calina et al., 2021). Therefore, governments must implement programs and policies to effectively monitor and manage alcohol consumption and related complications, particularly during crises. This literature review explores the economic and psychosocial factors that contribute to alcohol consumption during the COVID-19 pandemic, and it also examines various established policies worldwide and in Grenada aimed at regulating alcohol use.

ALCOHOL USE IN LATIN AMERICA AND THE CARIBBEAN

The injection of the COVID-19 pandemic into the world has dismantled life on social, cultural, and personal levels. Around the globe, people have been grappling with fear, panic, and uncertainty as they struggle to adjust to the effects of imposed social distancing and isolation associated with lockdowns. A common thread throughout the literature shows that the ramifications of lockdown imposition continue to have the most notable impact. Restrictive environments create a bubble for many, which may be detrimental to their personal and social lives (Ramalho, 2020). These measures can affect individuals' well-being in a variety of ways and can lead to extreme stress. Such stress and isolation can be a breeding ground for substance abuse of many forms, including alcohol, a substance that is easily accessible (Ramalho, 2020).

Several studies have shed light on multiple risk factors for increased alcohol use. In the region of Latin America and the Caribbean (LAC), research has shown that being both male and wealthy has been associated with a higher frequency of drinking behaviours. Being quarantined was positively associated with a higher frequency of online social drinking and drinking in the presence of children (Garcia-Cerde, 2021). Male gender, higher income, and a higher level of quarantine practices increased the risk for more frequent episodes of heavy episodic drinking (HED) (Valente et al., 2021). Research illustrates that the management of non-communicable diseases (NCDs) during the COVID-19 pandemic has been impacted, as many experienced a decrease in available resources. In turn, there was an increase in behavioural risk factors that exacerbate NCDs, such as increased alcohol use, with the Americas (including LAC) demonstrating the highest rates of alcohol misuse (WHO, 2020). Since the onset of the COVID-19 pandemic, economic and social living conditions have changed in many ways – from the national, state, county and parish level to personal changes limited to the family unit or individual community member. Implementation of several measures by governments to mitigate the spread of infection included lockdowns of varying degrees. It is common knowledge that lockdown orders necessitated the disruption and even closing of many non-essential businesses, leading to a spectrum of economic crises. Some individuals lost their jobs, some worked reduced hours, while a section worked, studied, or stayed at home for the duration of the lockdown.

According to the Organisation for Economic Co-operation and Development (2021), Australia, Austria, Brazil, France, Germany, Ireland, the Netherlands, New Zealand, Switzerland, the United Kingdom, and the United States reported increased consumption of alcohol between May and June 2020 in 36% of study participants. In Non-Latin Caribbean areas, respondents reported an increase in wine and spirits consumption from March to June 2020 of the pandemic (PAHO, 2020). These outcomes may be related to multiple government-led lockdowns and stringent measures to contain the virus (OECD, 2021). McPhee et al. (2020) determined a comparable increase in alcohol consumption during the pandemic's social distancing phase compared to its pre-pandemic counterpart. Other research revealed a 477% increase in online alcohol sales by the end of April 2020, although this statistic may be inflated due to the concomitant closure of bars and decreased frequenting of restaurants in general (Calina et al., 2021). Other data, however, demonstrated an overall decrease in the prevalence of drinking from March through June of 2020 (PAHO, 2020). In Non-Latin Caribbean areas, this statistic was consistent with decreased beer consumption and homemade alcoholic drinks. Although the overwhelming majority in this region reported no change in frequency of HED from 2019 to 2020, a more significant percentage reported decreased (17.2%) rather than increased (9.7%) frequency of such drinking behaviours (PAHO, 2020). Still, of the respondents who reported engaging in HED, there was a 3.5% decrease in help-seeking behaviour from 2019 to 2020 (PAHO, 2020).

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Historically, research has illustrated an association between pandemic stressors and increased prevalence of alcohol use disorder (AUD) and alcohol-related harms. This relationship was manifested during Beijing's 2003 SARS outbreak: hospital employees reported increased alcohol abuse and dependence symptoms (Ramalho, 2020). In a cross-sectional study conducted in the United States, participants who reported extreme stress due to the COVID-19 pandemic also disclosed higher alcohol consumption (Grossman, Benjamin-Neelon & Sonnenschein, 2020). Participants reported increased alcohol consumption at home in parallel studies across countries like China, the UK, Germany, and Brazil (Garcia & Sanchez, 2020). Overall, those "reporting economic worries, those quarantined and those studying or working at home" were more likely to report hazardous drinking behaviour (Garcia & Sanchez, 2020; Alpers et al., 2021, p. 5).

Beyond public health crises, increased alcohol use is a trend that has been noted amidst natural disasters as well. An association between exposure to stressful aspects of a natural disaster and self-perceived changes in alcohol consumption was found in a study conducted among repatriated Norwegians who resided in Southeast Asia during the 2004 tsunami (Nordløyken et al., 2016). Similarly, in the United States, those diagnosed with post-traumatic stress disorder after Hurricane Sandy (2015) were more likely to engage in binge drinking (Locke et al., 2020). In addition to excessive alcohol consumption, natural disasters' resulting economic and physical strain often leads to other increased harmful behaviours such as violence (Charveriat, 2000).

TIMES OF CRISIS: ALCOHOL CONSUMPTION IN GRENADA

Previous yet limited studies in the Caribbean have demonstrated a negative correlation between alcohol use and mental health in times of crisis. Per the patterns in Southeast Asia and the United States mentioned above, there has been an increase in alcohol-related problems in Caribbean countries following natural disasters such as hurricanes, especially those living in shelters (Gordon Stair & Pottinger, 2005). There is evidence that 29% of people who live in LAC are affected yearly by natural disasters. According to a Grenadian sociologist, Hurricane Ivan was recorded as the worst natural disaster to strike Grenada, resulting in thirty-nine casualties (Douglas, 2006). While limited research has evaluated alcohol use during natural disasters, empirical evidence has shown a positive relationship between exposure to natural disasters and alcohol use.

Like other Caribbean territories, alcohol consumption in Grenada is deeply rooted in the country's social and cultural norms (Japal & Benoit, 2017), with an average daily intake of pure alcohol at 40.4 grams exceeding the world's average of 33 grams (Campbell, 2018). According to the 2018 Global Status Report on Alcohol and Health, trends in recorded Grenadian alcohol per capita consumption trend have favourably seen a decline from 12.5 litres in 2014 to 9.3 litres in 2018. However, per capita consumption of unrecorded alcohol increased from 0.7% in 2014 to 1.4% in 2018 (Campbell, 2018). Despite the decline of recorded alcohol consumption, HED has increased among drinkers, with the majority consuming spirits and beer (Campbell, 2018). HED has been shown to become even more concerning during pandemic lockdowns, a reason why it is pertinent to continually monitor the rate of alcohol consumption. Like other countries, Grenada took proactive measures to reduce the spread of COVID-19 by instituting curfews and restricting movement. While these efforts aided in curbing the sale and consumption of alcohol, the established infrastructure was not equipped to manage such measures' psychosocial repercussions effectively.

Despite the alarming baseline rate of alcohol consumption in the country, Grenada's sole rehabilitation facility, Carlton House Treatment Center, has been operating on a significantly reduced workforce since 2006 (GBN, 2020). As a result of the limited capacity, there remains a lack of support services available for individuals who struggle with substance abuse. Consistent with global trends, it can be deduced that Grenada's demand for these services has been exacerbated during the COVID-19 period. As Grenada grapples with the impact of the COVID-19 pandemic, especially during lockdown periods, it is imperative to evaluate how economic and psychosocial factors impact alcohol consumption. Of equal importance is enabling access to support services that aim to minimise the overall impact of alcohol consumption on one's social, emotional, and mental health. In total, findings from this review paper will address the gaps in the literature regarding the impact of COVID-19 on the fibre of Grenadian society. They will also form the foundation for new policy interventions that address alcohol use for the remainder of the COVID-19 pandemic and beyond, as the extent of the psychological impact of this pandemic is only beginning to be elucidated.

METHODOLOGY

A literature review was conducted to identify sources discussing alcohol use globally during the 2020-2021 COVID-19 lockdown period, concentrating on the Caribbean region and Grenada. The literature search focused on the following themes: (i.) economic factors that contributed to alcohol use during the lockdown period; (ii.) the psychological impact of alcohol use on physical, emotional and mental health; (iii.) existing and proposed measures (policies and programs) that can be taken to address excessive

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alcohol consumption. Analysis of peer-reviewed articles and reports from regional and international public health agencies, including but not limited to the World Health Organization and the Pan-American Health Organization, were included in this literature review. Additionally, webpages of the Government of Grenada, Government of the United Kingdom, the Governor's Highway Safety Association, the World Bank, the International Monetary Fund, the Organisation for Economic Co-operation Development, and the United States National Bureau of Economic Research were used to access fact sheets and reports. The primary tools used for the literature search were PubMed, Google Scholar, ScienceDirect, Embase, Scopus, ProQuest, and Web of Science.

The databases were searched using the keywords "alcohol use" and "alcohol consumption" cross-referenced with "attitudes," "knowledge," "practices," "health care resources," "Caribbean," "Grenada," "natural disasters," "hurricane," "economic factors," "socioeconomic factors," "psychological factors," "psychosocial factors," "social factors," "mental illness," "domestic violence," "suicide," "policy," "COVID-19," "2019-nCoV," and "pandemic." The relevance of articles of the themes under study was assessed using their titles, abstracts, and conclusions. The literature inclusion criteria were based on publications in English within the previous twenty years and based on full-text availability. Data sources were excluded if they were conferences, publications addressing alcohol consumption but not during times of disaster, substance abuse evaluation of substances other than alcohol, or addressed other extraneous factors impacting and contributing to alcohol consumption. A total of 64 data sources were used in this literature review. Of these sources, 22 were related to economic factors that contributed to alcohol use during the lockdown period; 14 were related to the psychological impact of alcohol use on physical; and 30 were related to emotional and mental health, as well as measures that can be taken to address excessive alcohol consumption. A total of 58 sources included were published within the last twenty years. Six sources beyond this period were included due to the relevance of their content to the subject matter. Unfortunately, the search produced limited studies conducted in the Caribbean region and Grenada on COVID-19 and alcohol use.

ECONOMIC FACTORS

In April 2020, during the initial stages of the COVID-19 pandemic, the International Monetary Fund (IMF) reported a global economic contraction of 3%, akin to the contraction experienced in the worldwide recession of 2008-09. In an attempt to protect lives and allow health care systems to manage the sudden increase in demand for emergency and intensive services, various countries employed stay-in-place orders. Regulations included lockdowns, home isolations, the closure of state borders, and the halting of activity from several sectors, especially where physical interaction was inevitable. As a result, economic activity substantially slowed, and the full extent of the fallout has yet to be determined (International Monetary Fund, 2020).

Economic crises or contractions within a country may usher in the loss of jobs, income, promotion, and wealth (Ruhm, 1995; Amadeo, 2021). These consequences, in turn, have been associated with intensified mental health complications and a myriad of other health conditions, including high rates of cirrhosis and cardiovascular disease (Brenner, 1979). The COVID-19 pandemic has caused an economic downturn, which is considered one of the most severe experienced in the last 100 years (Alcohol Change U.K., 2020). The OECD has anticipated that these economic effects "will cast a long shadow over the world" (Walker, 2020, para 3), indicating the geographical and temporal immensity of the situation.

Grenada experienced a period of economic contraction during its lockdown due to COVID19 (World Bank, 2020). As with other Small Island Developing States (SIDS), Grenada's primary financial industry is tourism. As policies were established to curb the spread of COVID-19, there was a consequent suspension of tourism activities and other profitable industries, causing a reduction in economic growth by about 12-15 per cent (World Bank, 2020). This economic downturn experienced by Grenada is not unlike those faced by other countries over the years. For example, the United States of America has endured several economic crises, most notably during the Great Depression of the 1930s and, more recently, the Great Recession in 2008 (Amadeo, 2021).

Similar to Grenada's economic contraction, the economies of more developed countries have also been negatively impacted by COVID-19. The National Bureau of Economic Research (2021) informed that the U.S. economy saw a halt in its economic growth in February 2020 – its first downturn since 2009. During the subsequent year, the U.S. experienced a contraction in its economy due to a series of outcomes from the pandemic and policies to protect the public (Bauer et al., 2020). Some of these outcomes included increased unemployment, worsening food insecurity, and the inability of some families to make monthly rent payments (Bauer et al., 2020). Countries in East and Central Asia, The Pacific, and Europe experienced comparable economic consequences of the pandemic (World Bank, 2020).

There is an abundance of conflicting evidence on whether economic downturns and contractions decrease or increase alcohol consumption (Alcohol Change U.K., 2020, Goeij et al., 2015). According to Ruhm (1995), health is an economic good such that changes in incomes and earnings are related to differences in health outcomes. For example, loss of income can lead to loss

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of health insurance, resulting in adverse health outcomes. According to Skog (1986) and Wagenaar and Streff (1989), income is positively correlated with consumer goods such as alcohol, implying that as income increases, alcohol consumption increases and vice versa. Dziadkiewicz et al. (2015) agreed that the demand for goods and services would change depending on an individual's income because of Income Effect Theory. Therefore, if alcohol is classified as a normal good, as income decreases during an economic contraction due to unemployment, alcohol consumption should also reduce (Popovici and French, 2013). It is proposed that this reduction in consumption occurs secondary to an imperative(necessary) focus on more essential items such as food, clothing, and bills during these periods.

Catalano and Bellows (2005) favour policies that encourage economic contractions because an inhibition effect during a recession purportedly results in workers demonstrating safer behaviours and public health practices such as a reduction in cigarette use and alcohol intake, as well as an increase in exercise. Catalano et al. (1997) described the inhibition effect as one where a person may become the ideal employee out of fear of losing their job, which translates to better health outcomes. With job insecurities relatively high during a recession, people are inclined to drink less alcohol to avoid attracting attention and risking their jobs (Alcohol Change U.K., 2020).

In the U.K., it has been found that 43% of employees believe that they have experienced peer pressure to consume alcohol during work social events (Webber, 2019). Amidst the pandemic, this statistic could imply reduced alcohol consumption among individuals who have lost their jobs and those still employed, but in the absence of peer pressure (Alcohol Change U.K., 2020). However, during economic downturns, it has been observed and documented that, despite this reasoning as to why alcohol consumption might decline, there is also evidence of its increase (Goeij et al., 2015). Goeij et al. (2015) found that persons who experience a reduction in income due to an economic recession turn to cheaper alcohol forms or even home distilling. Doran and Digiustio (2011) and Karlsson et al. (2010) observed that during crises in Finland and Australia, the consumption of distilled spirits declined, but there was an uptick of beer, wine, and cider. Likewise, in Russia, persons switched from purchasing alcoholic beverages to making and consuming their own (Perlman, 2010).

Furthermore, it has been found that people substitute drinking at bars, which entails an appreciable product markup, to drinking at home (Munne, 2005). An example of this shift was documented during an economic crisis in Argentina. The evidence revealed that 75% of the study population knew individuals who stopped visiting bars but instead consumed alcohol at a friend's or their own home (Munne, 2005). These debates on the surge versus reduction of alcohol consumption secondary to economic circumstances should not be analysed in isolation, as various factors influence a person's decision to partake in increased or decreased alcohol use.

PSYCHOSOCIAL FACTORS

Several patterns emerge upon reviewing the recent literature investigating alcohol use and individual and societal health during lockdown periods throughout the COVID-19 pandemic. There have been numerous repercussions on mental and emotional health. Overall, the social distancing and isolation resulting from mandated lockdowns are associated with increased reported depressive symptoms (McPhee et al., 2020; Alpers et al., 2021; Killgore, Cloonan, Taylor, Lucas, & Dailey, 2021). As social creatures, humans thrive when allowed to assemble and engage in social interactions. During lockdown times, however, residents are limited with such exchanges and are at increased risk of psychological decline (Bell et al., 2021; Alpers et al., 2021). Concerns other than restricted social interactions also contribute to increased psychological distress (Bell et al., 2021; Tsai et al., 2021). These sources of stress include economic uncertainty and employment insecurity; housing instability; anxiety surrounding SARS-CoV-2 infection of self or others; strained interpersonal relationships, and reduced access to mental health services (Killgore et al., 2021). Collectively, these changes in social, financial, and psychological functioning are associated with a greater tendency to drink alcohol as a coping mechanism, which is a predictor of increased alcohol consumption both in frequency and quantity (McPhee et al., 2020; Valente et al., 2021; Alpers et al., 2021).

In general, stress or trauma can cause disruptive usage of alcohol. In a cross-sectional study conducted in the United States, participants who reported extreme stress due to the COVID19 pandemic also reported higher alcohol consumption (Grossman, Benjamin-Neelon & Sonnenschein, 2020). On a global scale, during the COVID-19 pandemic, women, parents of young children, people with higher income, and those with previously diagnosed anxiety and depression reported the most significant increase in alcohol consumption (OECD, 2021). In their study on alcohol dependence, Killgore et al. (2021) concluded that alcohol consumption is most notable among persons who lost their jobs during the pandemic. In the U.S., greater alcohol consumption was associated with younger age, male sex, and direct job loss due to the pandemic (Killgore, 2021). Douglas (2019) suggested that alcohol acts as a "magic potion or solution" to cope with stressful situations and is a means to manage personal problems among young people. Therefore, one can deduce that alcohol becomes a coping mechanism to manage stressful situations.

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Consistent with the behavioural and self-medication theories, more glaring social and environmental constraints and increased psychological distress during COVID-19 can result in increases in depression and drinking to cope with negative affect (McPhee et al., 2020). Tsai et al. (2021) found that a total of 35.3% of people in the U.S. screened positive for current AUD. The number of close friends, history of AUD, anxiety disorder, and younger age was significantly associated with screening positive for AUD (Tsai et al., 2021). Conversely, in a Thailand survey, the Government banned alcohol purchases at the beginning of the pandemic. As a result, prepandemic drinkers either abstained from alcohol or consumed fewer drinks than usual during the prohibition of alcohol sales (Wichaidit, 2021). These findings reveal how government policy can have a direct effect on alcohol consumption and resulting behaviours.

Indicative of the bidirectionality of these relationships, increased alcohol consumption is negatively associated with psychological well-being. Persons who use alcohol as a coping strategy for pandemic stressors report higher depression, anxiety, and stress (Stanton et al., 2020; Chodkiewicz et al., 2020). Increased alcohol consumption during lockdown has also exposed incidences of increased domestic violence and increased depression and anxiety in those not previously diagnosed (OECD, 2021). Further, persons who have been diagnosed with a mental illness before the start of the COVID-19 pandemic demonstrate an increased risk of deterioration of mental well-being during lockdown periods. In particular, a previous psychiatric diagnosis is a risk factor for increased anxiety, depression, suicidality, and, in turn, increased alcohol use (Bell et al., 2021; Tsai et al., 2021; PAHO, 2020). Notably, reported psychological distress in conjunction with AUD is associated with an increased risk of suicidality (Tsai et al., 2021). This distress is further supported by Bell et al. (2021), who found that increased alcohol use was associated with increased thoughts of suicide among persons with mental health issues.

Moreover, the World Health Organisation (WHO) warns that alcohol consumption can increase during self-isolation, and combined elements can increase the risk of suicide (WHO, 2020). Even more concerning, persons who report HED, or the consumption of about five alcoholic drinks on one occasion, demonstrate a decrease in help-seeking behaviour during the COVID-19 pandemic compared to prior (PAHO, 2020). These outcomes highlight the importance of enhancing access to mental health resources during distressing events.

As evidenced by the literature, the COVID-19 pandemic has dramatically changed people's lives and livelihoods. To manage stressors – loss of a job, loss of free movement, fear of contracting the virus, uncertainties relating to the COVID-19 pandemic, and changes to everyday living – persons used alcohol as a coping mechanism. Although research illustrates that alcohol is consumed primarily in social settings, the COVID-19 pandemic changed this dynamic. Alcohol was more frequently and more heavily consumed in the home, which aggravated many psychosocial issues outlined in the research: interpersonal violence, depression, loneliness, anxiety, and increased suicidal ideation – all of which have emerged as significant issues within the COVID-19 context.

POLICY AND PROGRAM RECOMMENDATIONS

As highlighted in this paper, excessive alcohol consumption is a significant concern, and it is imperative to implement public health policies and programs to mitigate its harmful effects. There are common policy interventions that have been implemented in OECD countries, such as taxes on alcoholic beverages, blood alcohol concentration limits for drivers, and age restrictions for purchase and consumption (OECD, 2021). While these evidence-based policies are not directly adaptable to Grenada without exploring the historical and socio-cultural practices underlying common drinking behaviours, valuable lessons can be drawn from the efforts undertaken by other countries, particularly those that emphasise policies focused on promoting public health.

POLICY LESSONS FROM THE OECD COUNTRIES

The age requirement for the purchase of alcohol in Grenada is a minimum of 16 years of age (Liquor Dealers' Licence Act, 1988), lower than most countries, including the United States (Center for Disease Control and Prevention, 2020), the United Kingdom (Government of the United Kingdom, n.d.), Australia (Australian Government Department of Health, 2020) and Bermuda (Liquor License Act, 1974). In 1997, The United Nations Children's Fund (UNICEF) reported that Grenada's provisions regarding the sale, supply, and delivery of alcohol to minors do not adequately ensure that those under 16 refrain from using or purchasing alcohol. It is noteworthy that Grenada's Liquor Dealers' Licences Act was last amended in 1988 (Liquor Dealers' Licences Act, 1988). To ensure public safety and reduce the early initiation of early alcohol exposure, policymakers in Grenada should consider reviewing the existing legislation. Two key areas that can be enhanced within that legislation include increasing the legal age limit for the purchase of alcohol from 16 to 18, equivalent to other Caribbean islands such as Barbados (Barbados Today, 2021), and strengthening the enforcement of existing legislation following the feedback from UNICEF. These adjustments will reduce the early initiation of alcohol and ensure that the legislation adequately protects those under the legal drinking age.

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Another policy solution is alcohol excise taxes. Alcohol is typically taxed in three different ways: the volume of the alcoholic beverage, the ethanol content, or the value of the alcoholic beverage (OECD, 2021). In Grenada, alcoholic beverages are taxed at a flat rate, either XCD 1.10 per litre for wines or XCD 4.40 per litre for all other alcoholic beverages (Government of Grenada, 2021)). To encourage manufacturers to reduce the alcohol content of beverages, taxes based on the volume of alcohol content tend to be favourable. In South Africa, a beer-excise tax based on ethanol content was implemented, leading manufacturers to produce and market lower-content alcohol products more aggressively (Chaloupka et al., 2019). Correspondingly, in Grenada, the alcohol manufacturing industry and other key stakeholders should be engaged in discussions to adjust the existing excise tax structure to discourage excessive alcohol consumption. As previously highlighted, alcohol is a normal good, suggesting that demand decreases as price increases. Hence it is worth exploring altering the existing tax structure to reduce the demand for high alcohol content beverages.

PROGRAMS IN PRIMARY CARE SETTINGS

Many countries have taken steps to address the adverse impacts of excessive alcohol consumption by introducing screening and prevention programs in the primary care setting (Kaner et al., 2018; Angus et al., 2014; O'Donnell et al., 2014). Several European and North American studies have investigated the knowledge, attitudes, and practices concerning health care resources for alcohol use. Nonetheless, establishing the necessary alcohol screening and intervention programs has been slow (O'Donnell & Kaner, 2017; Brown et al., 2016; Nilsen et al., 2011). Many/Most health care professionals remain optimistic that this issue can be addressed with adequate training (Mcmanus et al., 2003). Due to several factors, however, some maintain a more pessimistic outlook, thus hindering the widespread implementation of alcohol screening and prevention programs. These factors are multifaceted: a lack of knowledge and skillset to detect alcohol problems; the belief that healthcare professionals cannot indeed generate behavioural changes in patients with alcohol use issues; fear of offending patients due to the delicate subject matter; difficulty stimulating dialogue with patients who are not actively seeking assistance for alcohol-related problems; and perceived lack of time as health care professionals already feel overworked (Mcmanus et al., 2003; Johansson et al., 2005; Nilsen et al., 2011).

The literature presents some contradicting data: it indicates that patients widely support integrating alcohol screening and prevention programs into routine primary care. Multiple European and North American studies have reported that patients essentially welcome regular alcohol screening and are comfortable discussing the issue of personal alcohol use with health care professionals (O'Donnell et al., 2018; Aalto et al., 2003; Field et al., 2013; Hutchings et al., 2006; Miller et al., 2006; Broyles et al., 2012). While there is no related study in Grenada, it may be prudent to engage physicians, other healthcare providers, and patients in the possibility of instituting screening and prevention programs within the primary care setting. While execution may seem like a daunting task, this can be done in a phased manner, starting with the Public Medical Stations and Health Centers. The realisation of alcohol prevention and screening programs will require extensive training for all health care professionals within the system to ensure that they are sufficiently equipped to engage, assess, and refer patients to the relevant professionals.

FUTURE DIRECTION FOR GRENADA

Undoubtedly Grenada has generated efforts to address excessive alcohol consumption. In 2019, the Royal Grenada Police Force announced the use of breathalyser tests by police officers to assess the blood alcohol level of drivers (Grenada Broadcasting Network, 2019). In this report from Grenada's Broadcasting Network Newsroom, it was reported to the nation that the legal limit would be 160 milligrams of alcohol in 100 millilitres of blood. This measure is key to addressing drunk driving proactively and potentially reducing road accidents due to driving under the influence of alcohol. While this is a step in the right direction, this limit is double the rate in other countries, such as the United Kingdom (Drinkaware UK, 2021) and the United States (Governor's Highway Safety Association, 2021). While the socio-cultural norms of Grenada were considered when implementing this policy, it is essential to reevaluate the effectiveness of these regulations toward protecting the public's health.

Additionally, there have been several enhancements to Grenada's National School's Policy on Drugs for the period of 2018-2023. In 2019, the then Minister of Education announced that the sale of alcoholic beverages would be prohibited at school functions (Now Grenada, 2019). This pronouncement was a critical juncture in reducing the exposure of alcohol consumption to children. Within that policy, it was also highlighted that any drunk teacher while on duty would be guilty of misconduct (National School Policy on Drugs, 2018). These policy changes were wellreceived public health initiatives designed to protect children and reduce exposure to alcoholic beverages. However, it is important to explore how these policies might be strengthened, such as prohibiting any amount of alcohol consumption by teachers during school activities. It is also imperative to consider psychosocial

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support for students exposed to excessive alcohol consumption by their teachers or parents, who in turn may be at risk for early initiation of alcohol consumption themselves.

There are a variety of policies and programs that can be explored to reduce excessive alcohol consumption in Grenada. As Catalano and Bellows (2005) suggest, it may not be feasible to rely on an economic recession since numerous challenges accompany an economic decline. However, other policy solutions that will otherwise have a minor impact on society can be explored. These endeavours should be a synergistic effort between the Government of Grenada, Non-Governmental Organisations (NGOs), Faith-Based Institutions, Professional Bodies, Community Groups and other sectors within the society. This collaborative approach can yield policies that are well-received by the community. In a study conducted in East Africa, it was observed that NGOs played a crucial role in alcohol prevention and policy development; however, there is a need for broader and more substantial support to facilitate effective campaigns (Kasirye, R. & Swahn, M., 2015). To avoid duplication of efforts and maximise resources effectively, various stakeholder groups should be engaged regularly to discuss policy solutions, implementation strategies, and minimisation of complications related to excessive alcohol consumption. While this may be a challenge for the leadership of the Government of Grenada to undertake independently, Non-Governmental Organisations and Interest Groups can play a pivotal role with the necessary support, leadership and resources from the Government.

CONCLUSION

The ongoing COVID-19 pandemic has exposed the vulnerabilities of public health systems worldwide (Benjamin, 2020) and highlighted the urgency to build resilient health systems. As with many Small Island Developing State (SIDS), Grenada has been grappling with existing economic, social, and environmental hardships (OECD, 2015), and the response to the pandemic placed an even more pronounced burden on the society.

Excessive alcohol consumption is an ongoing concern in Grenada, with the average daily intake of pure alcohol higher than the world's average. It is paramount to evaluate existing economic and psychosocial factors contributing to excessive alcohol consumption among Grenada's population, especially in the wake of the pandemic's increased stressors. This exploration will provide a deeper understanding of the social determinants that inadvertently contribute to excessive alcohol consumption, which will aid policymakers in assessing existing policies and proposing amendments to meet the population's needs.

Policy adjustments will require active engagement with the community and key stakeholder groups (NGOs, Community Organizations, and Businesses) to ensure that updated policies reflect society's values. This approach fosters trust and encourages public participation in policymaking (Alemanno, 2015). The COVID-19 pandemic has highlighted the importance of working collaboratively to address a public health crisis. Grenada continues to forge ahead amidst the pandemic, engaging various stakeholder groups to address the existing and worsening problem of excessive alcohol consumption. The proposed solutions should be rooted within the context of the current global pandemic while looking forward and taking proactive measures to address the problem beyond the current situation. This approach will require ongoing evaluations to determine the effectiveness of existing policies and appropriate modifications to achieve the desired public health goal.

The literature has demonstrated the timeliness and gravity of investigating excessive alcohol consumption in Grenada, particularly during a crisis such as the COVID-19 pandemic. There is limited information on alcohol consumption in Grenada during this period, making it a challenge to evaluate the extent of the problem thoroughly and accurately. This review will be followed by a research study exploring the scope of alcohol use during the lockdown period and its impact on the people of Grenada. The findings will provide policymakers and public health professionals with a foundation to create policies and programs to address excessive alcohol consumption during a crisis and beyond.

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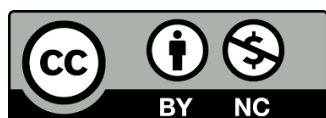
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Impact Evaluation of The Internal Control System on The Sales Function Performance Within Moroccan Companies' Context



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ABSTRACT : Moroccan business leaders are increasingly concerned about the phenomenon of declining commercial activity, confirmed by the economic barometers published by the General Confederation of Moroccan Enterprises (CGEM) during the last four years (2015-2018), and the direct causes that might be linked to unfair competition, payment delays problem, unpaid debts and finally the widespread of a heavy informal sector. Through this article, we are going to focus on the relationship that may exist between the components of an internal control system setup in a sales function and its performance. In other words, we are looking to explain the decreasing performance of the sales function using the evaluation of the internal control system deployed there. To do this, we will present in the first part, the theoretical foundations of the internal control system and socio-economic performance. Then, we will analyze the points of connection and influence to finally develop some hypotheses, which will be the subject of an empirical study based on of one hundred and sixty-one Moroccan companies. The results of our work provide an answer on the degree of influence of internal control system components of the commercial function on its socio-economic performance and more precisely on its commercial performance.

KEYWORDS: Internal control system, socio-economic performance, commercial performance COSO standard.

1. INTRODUCTION

In a context of economic openness, and on the basis of studies carried out by the CGEM [1] and more precisely in its reports published under the name 'economic barometer', a large number of Moroccan business leaders expressed, during the four in recent years, a poor perception mainly due to the non-performance of their companies observed in particular at the level of their commercial functions. The causes put forward by the business leaders interviewed during the studies carried out can be summed up in the decline in economic activity, unfair competition, the problem of payment delays, unpaid debts and finally the existence of a heavy informal sector.

The problem of the non-performance of the commercial functions of Moroccan companies, manifested by the causes cited below, aroused our curiosity as a researcher and led us to look into the reasons that could possibly explain the contribution of an internal control implemented within a sales function to improve its performance. To do this, we will first ask ourselves the following questions:

Are Moroccan companies concerned about the concern of controlling activities at the level of their commercial functions?

Do Moroccan companies ensure that their commercial functions are endowed with an internal control system which is specific to them and which participates in the control of all activities?

To our knowledge and on the basis of the research carried out, there is no scientific work explaining the performance of the commercial function of Moroccan companies by the effectiveness of the internal control system established there.

According to an institutionalist approach, and in a rapidly changing open economy, the poor performance of the commercial function within Moroccan companies could then be explained by the absence of an effective internal control system or the existence of an irrelevant internal control.

This article aims to answer the following question:

To what extent the internal control system influences the performance of the sales function within companies that have recorded a decline in activity and operate in a context of unfair competition, the problem of payment deadlines and unpaid debts and a heavy informal sector?

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Based on our research problem and under the economic conditions mentioned above, our main objective, through this contribution, is to understand the impact of the implementation of an internal control system at the level of the commercial function on its performance.

To do this, we will try to organize the work as follows:

First of all, in the first part, we will present the theoretical foundations of the internal control system and that of organizational performance by referring to works to give general definitions.

Also, we will try to mobilize a theory to develop a conceptual definition that will help us easily extract the hypotheses to finally conclude with a theoretical model of this research work.

Then, in a second part, we will try to identify the different variables of an internal control system, and this by using the empirical work of previous research to finally design our conceptual model.

Then, in a third part, we will examine the influence of the different components of an internal control system of a commercial function by a quantitative study on a sample of 161 Moroccan companies.

Finally, we will present the results obtained with a detailed discussion of the answer to our problem.

2. THE INTERNAL CONTROL SYSTEM: HISTORY OF THE MAIN DEFINITIONS AND NEW ROLE

Several definitions, developed by different bodies and committees, have been reported in the majority of scientific research work on the subject of internal control. In the present work, we have tried to select the most widely answered definitions and we have classified them in chronological order to highlight a history that traces the evolution of this concept since its appearance.

The first definition of internal control having been a real success due to the fact that it underlined a real overstepping of the usual accounting framework which was based solely on financial verification is the work of the French Order of Chartered Accountants in 1977. The latter shared a broader vision of internal control by defining it as follows: "Internal control is the set of securities contributing to the control of the company. It aims on the one hand to ensure the protection and safeguard of the heritage and the quality of the information, on the other to apply the instructions of the management and to promote the improvement of performances. It manifests itself in the organization, methods and procedures of each of the company's activities, to maintain its sustainability." (Renard, 2012) [2]

The second famous definition, dating from 1992, is established by The Committee Of Sponsoring Organizations of the Treadway Commission. In fact, it is a non-profit commission that has established a standard definition of internal control and created a framework to assess its effectiveness. By extension, this standard is also called COSO. For this commission "internal control is a process implemented by the board of directors, managers and staff of an organization intended to provide reasonable assurance as to the achievement of objectives".

In fact, the particular contribution of this definition is that it involves all the resources of the company from the base of the organization to its top. Each employee, from his hierarchical level, has his own internal control to monitor and respect in order to converge on the control of activities and the achievement of the objectives set.

The third definition was devised in 1995 by the Canadian Institute of Chartered Accountants. This institute describes control as "elements of the organization (including resources, systems, processes, culture and tasks) which, taken together, help to achieve objectives". It should be noted that the particularity of this definition is that it has placed the emphasis on the medium component and therefore it complements that of the COSO.

In addition to the three definitions cited above, we add the definition reported in the internal control guide (report published in 1999), known under the name "the Turnbull guidance" which takes up most of the COSO and COCO definitions in them. Supplementing with objectives. According to this guide, internal control as a system that encompasses policies, processes, tasks, behaviors and other aspects that are combined together in order to:

- Facilitate the effectiveness and efficiency of operations;
- Help ensure the quality of internal and external reporting;
- And help ensure compliance with laws and regulations.

In 2006, the French markets authority challenged internal control by using basic definitions as "a company device, defined and implemented under its responsibility. It includes a set of means, behaviors, procedures and actions adapted to the specific characteristics of each company which

Contributes to the control of its activities, the efficiency of its operations and the efficient use of its resources;

Must allow it to appropriately take into account significant risks, whether operational, financial or compliance. » (Renard, 2012, P5). [2]

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After reviewing the main definitions of internal control, it seems important to us to focus on the details of the mechanisms that constitute the pillars of an internal control system. To do this, we will use the work carried out by (Renard, 2012) to try to see the impact of each device (including the influencing factors) on the performance of the commercial function of companies, in order to be able to answer our problem. According to Renard, 2012. P128), [2] an internal control system is grouped into six families of devices, namely:

- Goals ;
- The means ;
- Information systems;
- The organization;
- The procedures ;
- The cheking process.

3. PERFORMANCE SOCIO-ECONOMIC AND COMMERCIAL PERFORMANCE

(Salgado, 2013) tried to shed light on the concept of performance and concluded that it is a "suitcase" word in the sense that all of its definitions remain fuzzy and multidimensional. [3]

In this work, we will limit ourselves to the literature review relating to a single dimension of performance. Namely the socio-economic performance. The latter in turn includes four categories, which are organizational performance, social performance, economic, and financial performance and finally commercial performance that we seek to explain via the families of devices mentioned above.

First, organizational performance tells us about how a business is organized to achieve its goals. (Bocco, 2010). [4]

Second, social performance, as its name suggests, provides information on the nature of social links and relationships within the company and provides information on the company's interest in the social aspect. In this sense, social performance can be measured by the quality of social links between entities, managers and employees. (Marmuse, 1997, cited Bocco, 2010). [4]

Thirdly, economic performance, also called financial, remains, for a large number of managers, the only criterion for evaluating and performing their companies. Indeed, experiences have shown that quite a few cases of failure of certain companies are not essentially due to non-financial performance and that their mastery of activities was behind their failures, thus leading to a drop in the turnover achieved and by therefore a commercial non-performance.

In this wake, the concept of commercial performance has taken a small place in the work of researchers and the majority treats it in its global sense. In this work, we have tried to focus on the literature having focused on this particular type of performance such as (Furrer & Sudharshan, 2003, Quoted by Bocco2010) [4] and (Bughin, 2006, Quoted by Bocco2010) [4]. In fact, the authors of this work link commercial performance in general to the satisfaction of end customers.

Also, (Croteau et al., 2001) [5], pointed out that the performance of a commercial function can be measured by referring to three dimensions. To know:

- Efficiency (comparison between commercial objectives and achieved results);
- Efficiency (comparison between the resources mobilized and the results of the function);
- Relevance (the comparison between the resources mobilized and the function's objectives).

4. DEVICES OF CONTROL INTERNAL AND PERFORMANCE TRADE: WHAT RELATIONSHIP?

According to (Renard, 2012), an internal control system includes six families of devices [2]. First, we will discuss the Objectives family. Indeed, the setting of objectives represents the first reference to which each manager reserves a particular interest. Let's take the example of the commercial function, a team called upon to make sales must refer to minimum thresholds, whether quantitative or qualitative, which make it possible to measure the productivity of the team and to have an idea of the level of commitment and the degree of involvement of each employee in order to be able to decide between them during evaluations. We can argue at this stage that goals give rise to competition and therefore to a mindset of excellence that will undoubtedly lead to a certain performance.

According to March's thesis (1978), the limitations of individuals working in the commercial function are limits of the capacity to calculate the future consequences of their current actions, given the complications of forecasting future consequences, and forecasting decisions related to these consequences, the organization of these decisions and the use of their memories. March (1978) then suggests the development of decision procedures which are reasonable and which take into account the constraints of the function. On this basis, we develop the following hypothesis:

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4.1. Hypothesis-1: the absence of objectives could have a negative impact on the performance of the sales function.

(Renard, 2012) also underlines that the 'Objectives' control system, set up within the sales function, will be of no use in cases where:

- The objectives of the commercial function are not known and communicated;
- Risks that could harm the objectives of the sales function have not been identified;
- Failure to set a policy within the sales function that can achieve objectives and manage risks;
- Action plans capable of achieving this policy have not been established.

On this basis, we will extract the four sub-hypotheses linked to our first hypothesis cited above:

Under hypothesis-1.1: Ignorance and non-communication of the objectives set to the commercial functions would negatively influence the performance of the latter.

Under hypothesis-1.2: Failure to identify the risks inherent in the activities of the commercial functions could have a negative impact on the performance of the latter.

Sub-hypothesis-1.3: The absence of a policy to achieve the objectives of the commercial functions would influence the performance of the latter

Sub-hypothesis-1.4: The absence of action plans to deploy the policies of the commercial functions would negatively influence the performance of the latter.

The second family of devices is the Means. It should be emphasized that the setting up of the 'objectives' control mechanism is behind the setting of the means. In this sense, several findings of anomalies issued by internal auditors are mainly due to an insufficiency or inadequacy of the means made available to achieve the objectives set.

On this basis, we can develop our second hypothesis:

4.2. Hypothesis-2: the lack of resources could have a negative impact on the performance of the sales function.

In addition, the concept Means encompasses several forms and categories. In previous research, especially empirical research, talking about means often refers to a separation by type of the latter. We cite, for example, human resources, financial resources, technical resources and commercial resources.

In this sense, we can formulate the sub-hypotheses below:

Under hypothesis 2.1: The lack of human resources to achieve the objectives set for the commercial functions would have a negative influence on the performance of the latter.

Sub-hypothesis 2.2: The lack of financial means to achieve the objectives set for the commercial functions would negatively influence the performance of the latter.

Sub-hypothesis 2.3: The absence of technical means to achieve the objectives set for the commercial functions would negatively influence the performance of the latter.

Under hypothesis 2.4: The absence of commercial means to achieve the objectives set for the commercial functions would have a negative influence on the performance of the latter.

Thirdly, we will discuss the most sensitive and most important family of internal control systems, particularly in complex structures. These are Information Systems. Information and communication play a vital role in the success of any coordination and are the essential basis of all decision-making. Information systems provide internal control actors with information that will be assessed and therefore mobilized. For others, they are dispensable in the sense that all of the company's activities are coordinated and monitored through information and communication. Indeed, without these, the internal control system will be doomed to failure, insofar as all those responsible for its implementation will not be informed OUTSEKI J. (2019). Also, the decision based on information extracted from information systems cannot be taken in the absence of said information systems (Rittenberg, Larry E, 2006). [6]

In practice, we cannot speak of the effectiveness of an information system considered as an internal control device within a sales function unless it is capable of fulfilling the following conditions:

- Sales function activity monitoring dashboards are installed.
- Sales function management dashboards are installed.
- Commercial management dashboards are installed.

Despite this, we can say that the efficiency of information systems could guarantee the permanent availability of reliable and useful information that will serve as data channels that will allow operational managers to better control all activities and guarantee the desired performance.

On this basis, our third hypothesis will be:

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4.3. Hypothesis-3: the absence of information systems could have a negative impact on the performance of the commercial function.

As presented above, the variables that can positively or negatively impact the contribution of information systems as an internal control system are monitoring, management and finally steering dashboards. In addition, piloting is the pinnacle of the COSO model (2013). It assumes that the effectiveness of the internal control process is linked to its periodic and / or ad hoc evaluation and to communicate the weaknesses internally of the organization in order to put in place corrective actions (feedback loop) (Noiret and Walter, 2008; Vaassen et al, 2009; Ki-zerbo, 2013, cited by OUASHIL & OUHADI, 2019). [7]

This is what leads us to develop the three sub-hypotheses below:

Under hypothesis 3.1: The absence of dashboards for monitoring the activities of the commercial functions would have a negative influence on the performance of the latter.

Under hypothesis 3.2: The absence of management dashboards for the activities of the commercial functions would have a negative influence on the performance of the latter.

Under hypothesis 3.3: The absence of management dashboards for the activities of the commercial functions would have a negative influence on the performance of the latter.

The fourth family of internal control systems is the Organization. Fayolle said that we can only control what is organized (Renard, 2012, P.135) [2]. From this quote we can conclude that control is closely related to the organization. Also, according to the same author, a good organization depends on three variables, namely:

- Appropriate and logical organization: for a sales function to be efficient, its organization should be adapted to the types of activity, the environment and especially the culture.
- Objective and reasoned organization: for a sales function to be efficient, its organization should take into account the skills of its resources and place them in positions consistent with their basic training.

Organization based on the distribution of tasks: If a sales manager plans to assign the same person tasks that are incompatible. The latter runs the risk of not controlling all of the activity and therefore giving rise to situations of fraud. Control is a culture based primarily on the separation of tasks in general and incompatible ones in particular.

That said, the organization adopted within the commercial functions would present the essential criterion to hope for a performance of the latter. In this sense, we develop our fourth hypothesis and the three sub-hypotheses that emerge from it:

4.4. Hypothesis-4: the absence of the organization could have a negative impact on the performance of the sales function.

Sub-hypothesis 4.1: The absence of a suitable organization within the sales functions would negatively influence the performance of the latter.

Sub-hypothesis 4.2: The absence of objective organization within the commercial functions would negatively influence the performance of the latter.

Sub-hypothesis 4.3: The absence of organization based on the separation of tasks within the commercial functions would negatively influence the performance of the latter.

The fifth family of devices is the Procedures. In fact, all control activity includes standards and procedures deployed within the company to anticipate the risks likely to hinder the achievement of the set objectives (Mandzila, 2004) [8]. An absence of the procedures which outline all the controls to be carried out by the operational staff within all the activities linked to the sales function would result in non-achievement of the objectives and consequently a non-performance of the entire function, hence the hypothesis next :

4.5. Hypothesis 5: the absence of procedures could have a negative impact on the performance of the sales function.

As for the sixth and last family of devices, in this case **Verification**. This system refers to the supervision exercised by the direct hierarchy which is called upon to ensure the level of control of the company's activities. This is a first level control by which operational managers demonstrate to their teams that their actions are verified and monitored. This exercise, carried out at random frequency, promotes compliance with operating procedures, avoids the occurrence of identified risks and would contribute to the performance of the company's functions, including the commercial one. This link will allow us to develop our fifth hypothesis:

4.6. Hypothesis 5: the absence of verification could have a negative impact on the performance of the sales function.

In addition, it is important to cite the factors likely to create negligence on the part of those responsible for verification, such as disproportionate trust in the teams, the lack of materialization of the verifications carried out, the incompetence and skill of the actors responsible for the verification. Verification and finally the supervision mode (on site or remotely).

All of these factors will give rise to the sub-hypotheses below:

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Sub-hypothesis 5.1: The absence of supervision due to trust in the sales function teams would negatively influence the performance of the latter.

Sub-hypothesis 5.2: The absence of materialization of the verifications carried out within the commercial functions would have a negative influence on the performance of the latter.

Sub-hypothesis 5.3: The lack of competence and skills of the auditors of the activities of the commercial functions would negatively influence the performance of the latter.

Sub-hypothesis 5.4: The mode of verification (on site / remotely) of the activities at the level of the commercial functions would have a negative influence on the performance of the latter.

Finally, on the basis of our literature review, the non-performance of the sales functions would be the result of:

- Ignorance and non-communication of the objectives set for commercial functions.
- The lack of human, financial, technical and commercial resources necessary to achieve the objectives set.
- The lack of an information system making it possible to provide dashboards for monitoring, managing and steering the activities of the sales function.
- The absence of the appropriate and objective organization avoiding any accumulation of incompatible tasks by the same resource.
- Finally, the absence of direct and indirect verification.

After formulating the six hypotheses on the relationships between the different variables of our model, we will graphically design our conceptual model for empirical analysis of data on the performance of the commercial function to try to verify it later with our sample. Of Moroccan companies.

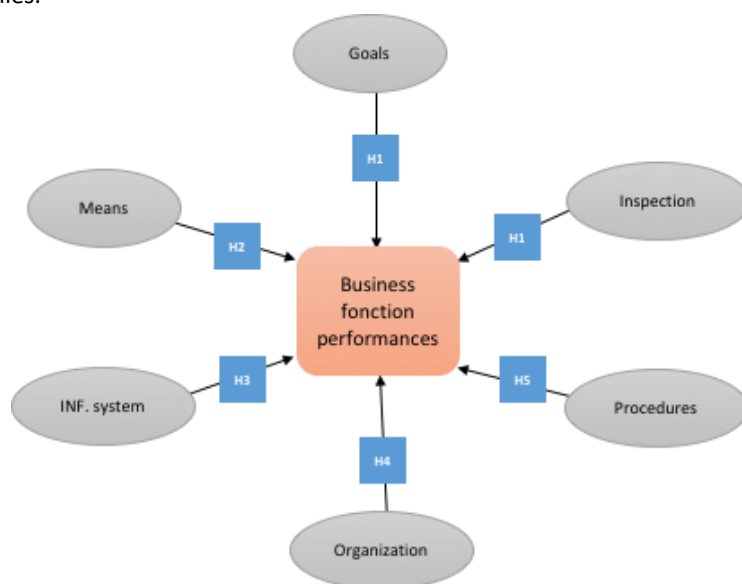


Figure 1: Conceptual research model (RCM).

5. RESULTS OF THE EMPIRICAL STUDY

The empirical study carried out focused on a sample of 161 Moroccan companies all having an internal audit structure and commercial departments and we will also find there, specialized audit firms having carried out internal audit missions and of advice. Our objective, via this quantitative study, is to validate the hypotheses made above by using statistical tests and validated measurement scales.

Let us recall our first starting hypothesis relating to the ignorance and non-communication of the objectives set to the commercial functions. The results of unilabiate statistics have shown that a large number of companies in the interviewed sample confirm that the objectives are set and applied to their commercial functions, i.e. (91.8% of responses). Within the commercial functions of Moroccan companies, the objectives are set and broken down by reference to policies, which guarantee their achievement, and to analyze of the risks, which may hinder their achievements. Despite this, the objectives as an internal control device positively and significantly affect the performance of the sales function within Moroccan companies.

The second hypothesis relates to the absence of the human, financial, technical and commercial resources necessary to achieve the objectives set. The statistical results showed that 89.13% of the managers of the commercial departments questioned confirm the availability of the human, financial, commercial and technical resources necessary to carry out the operations undertaken at the

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level of their various activities. On this basis, we can confirm that in Morocco, the performance of the commercial functions is ensured by the availability of human, financial, commercial and technical resources necessary for the execution of the fixed action plans.

Verification of the third hypothesis relating to the absence of information systems and its impact on the performance of the commercial function revealed the following, based on the answers provided:

- The overwhelming majority of Moroccan companies in the sample studied have information systems through which they publish daily monitoring reports on their activities.
- In Morocco, companies monitor the achievement of their commercial objectives using management dashboards and the implementation of committed action plans using steering dashboards. That is 95% of our sample.

The fourth hypothesis relating to the absence of the organization as an internal control device and its influence on the performance of the commercial function has been validated and the results obtained confirm it. That said, according to the answers obtained, the majority of managers of commercial departments (91.6%) agree that within their commercial functions there is an objective structure (hierarchical organization chart) which takes into consideration the principle of separation of duties. .

As for the procedures and their impact on the performance of the commercial function, the study carried out confirmed that Moroccan companies agree on the evidence that their activities within their commercial functions are governed by written procedures which serve better master the management operations of each activity.

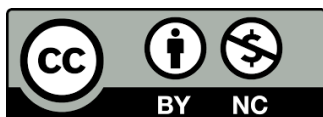
Finally, the impact of the verification system, established within the commercial functions, on the performance of the latter is justified in the sense that a majority represented by a percentage of 89.01% of Moroccan operational managers confirm that the control operations have been carried out. Provided by direct and indirect managers with traceability and materialization of findings to mitigate any risk that may give rise to poor performance.

6. CONCLUSION

Based on our empirical study, the answer to our problematic posed within the framework of this scientific contribution is that the internal control system as presented by its six families of control system, namely the objectives set, the means, information systems, organization, procedures and verification significantly and positively influence the performance of commercial functions. That said, we were able to confirm that the establishment of these systems will guarantee the control of operations within each commercial activity and consequently the effectiveness of the internal control system and the performance of the entire function.

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Information Technology Challenges of Family Planning and Reproductive Health During The Covid-19 Pandemic in Lebak District, Indonesia



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ABSTRACT: During the COVID-19 pandemic, all activities are carried out online. One of them is the provision of information on Family Planning and Reproductive Health which must be provided to supervise family planning acceptors so that they do not experience discontinuation of contraceptive use. This study aimed to evaluate the provision of information on Family Planning and Reproductive Health provided online to the public. This study used a One-Shot Case Study design. The intervention given was the provision of contraceptive information through the WhatsApp group. The research sample was married women aged 15-49 years who used the pill and injection contraception in Lebak District. The number of samples in this study was 94 respondents. In this study, about 11% of married women stated that they had difficulty accessing contraceptive services during the COVID-19 pandemic. After being given information on Family Planning and Reproductive Health through WhatsApp groups, 66% of respondents stated that the intervention provided increased knowledge about contraception, 18% complained about the use of quotas, 6.4% stated that they could not understand because they were used to face-to-face. This study also explored information about suggestions for contraceptive service programs, namely 14.9% expects services and providing information on Family Planning and Reproductive Health to be carried out face-to-face and 12.8% recommended free contraceptive services. Conclusion. Providing information on Family Planning and Reproductive Health online is an alternative during the COVID-19 pandemic. However, during contraceptive services, health workers still directly provide information as needed. Information on payment for contraceptive services using health social security agency must be provided to acceptors and contraceptive service activities funded by the national family planning coordinating board must also be informed to increase the coverage of contraceptive use.

KEYWORDS: Information technology, family planning, contraception, covid-19

I. INTRODUCTION

The COVID-19 pandemic has not only reduced the number of contraceptive use in Indonesia, but most countries in the world have also experienced a decline in contraceptive use [1–3]. This is due to concerns about the spread of COVID-19 when they come to health facilities to get contraceptive services. People prefer not to go out of the house and limit access to contact with health workers or family planning officers as providers of contraceptive services and information on Family Planning and Reproductive Health. [4,5].

This decrease in contraceptive use has an impact on unwanted pregnancies. In low- and middle-income countries due to barriers accessing contraceptive services. it is estimated that an additional 49 million unmet need for modern contraception and 15 million unwanted pregnancies occur in a year [6]. In Indonesia, the number of unwanted pregnancies reaches 20.3% [7]. Various efforts and policies have been set by the government to prevent a worse impact. The government urges to postpone pregnancy until the pandemic ends by using contraception that can be reached by every couple of childbearing age [8].

To overcome barriers in access to contraception and information services, digital health technology or information technology is a strategic step during the COVID-19 pandemic. Information technology can help contraceptive service providers maintain access to services or information to clients. This information technology can be in the form of text messages, telephone calls, websites, or applications that can be accessed independently by clients [2,9].

Information technology can increase public knowledge, so people can protect themselves from unwanted pregnancies by using affordable contraception during the COVID-19 pandemic [2,9,10]. A large study reported a very useful application that functions

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to coordinate the family planning community and identify countries that are at risk of shortages of contraceptive stocks then collaborate with suppliers and send them to these countries. Likewise, information is provided by the provider via telehealth so there is no direct contact. Complete information is provided regarding contraceptive methods, issuing prescriptions, screening using medical eligibility, and how to deal with side effects. through the ministries of health in Uganda, Madagascar, Congo, and Sinegal also collaborated to conduct DMPA-SC injection training independently through virtual [11].

In Indonesia, telehealth or telemedicine has developed which helps access health services, including contraceptive services. Telehealth or telemedicine is an urgent matter and a basic need during this covid-19 pandemic [12,13]. The government cooperates with cellular telecommunications service operators to support community activities using telecommunications services and telemedicine services [14], and in Indonesia, the number of internet and smartphone users is included in the top 10 in the world [15,16].

Family planning and reproductive health information through an official website or online media before the pandemic period has been widely promoted and increased during this COVID-19 pandemic. The use of social media such as Instagram, Short Message Service, WhatsApp is effective in increasing communication access and has a positive impact on knowledge and behavior of the contraceptive use [17–19]. To further increase utilization and find out the right method of distributing information, this study aims to evaluate the results of online family planning and reproductive health information dissemination activities.

II. METHOD AND MATERIAL

This study uses a One-Shot Case Study design. The intervention was only given once, then immediately evaluated, namely the provision of contraceptive information through the WhatsApp group. The intervention was carried out for one month and then an evaluation related to the intervention. WhatsApp group consists of respondents, health cadres, and family planning officers. Family planning and reproductive health information are provided once a week. The material consists of family planning education e-books and flyers published by the national family planning coordinating board and the Ministry of Health. In the WhatsApp group, respondents can have discussions with health cadres or family planning officers. Discussions in WhatsApp groups are not limited in time within 24 hours.

The research sample was married women aged 15-49 years who used pills and injections in the work area of the Mandala Health Center and Cibadak Health Center, Lebak District. The number of samples in this study was 94 respondents. This research has obtained ethically appropriate information from the health ethics committee of the Health Polytechnic of Semarang, Ministry of Health with the number 269/EA/KEPK.2021.

III. RESULT

Table 1. The Overview of Contraceptive Services Access During the Covid-19 Pandemic Period in Lebak District in 2021

Difficulty Accessing Contraceptive Services During the Covid-19 Pandemic	n	%
Yes	84	89.4
No	10	10.6
Total	94	100.0

Table 1 shows that around 11% of married women aged 15-49 years find it difficult to access contraceptive services during the covid-19 pandemic.

Table 2. The Overview of Benefits Providing Family Planning and Reproductive Health Information through Whatsapp Groups during the Pandemic in Lebak District in 2021

The Benefits of providing family planning and reproductive health information through Whatsapp group	n	%
Increase knowledge	62	66.0
fast response and easy access	5	5.3
Can be done while doing homework	3	3.2
Can be read many times, anytime, and as a reminder for family planning	5	5.3
Complete and detailed answer	6	6.4
As a discussion room	6	6.4
No crowd	7	7.4
Total	94	100,0

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Table 2 shows that the benefits felt by married women on family planning and reproductive health information provided through WhatsApp groups are mostly stated that they increase knowledge (66%), and prevent crowds so that COVID-19 transmission does not occur (7.4%). Respondents also stated that in providing information through the WhatsApp group, the officers responded quickly, the information provided was complete, and could discuss the family planning issues they were facing, and most importantly as a reminder to repeat family planning.

Table 3. The Overview of the Limitations Providing Family Planning and Reproductive Health Information through Whatsapp Groups during the Pandemic in Lebak District in 2021

The Lack of information on family planning and reproductive health information through Whatsapp groups	n	%
Requires quota	17	18.1
Don't always hold the cellphone so it's late to read WA	3	3.2
Signal problem	4	4.3
Less understandable because they are used to face-to-face	6	6.4
link can't be opened	2	2.1
Saying there is no shortage	62	66.0
Total	94	100.0

Table 3. Shows a lack of providing family planning and reproductive health information through WhatsApp groups, most respondents complained about needing a quota to access the information provided (18.1%). Respondents also said they could not understand because they were used to face-to-face (6.4%), and signal problems were also a drawback in this online activity.

Table 4. Recommendations for Contraception and Information Services during the Pandemic Period in Lebak District in 2021

Suggestions for contraceptive services and information	n	%
Continue to provide contraceptive services and direct information	14	14.9
Free contraceptive services	12	12.8
Not giving advice	68	72.3
Total	94	100,0

Table 4 shows the recommendations given by married women for contraceptive and information services during the covid-19 pandemic, which is about 15% of married women suggesting that providers continue to carry out direct contraceptive and information services as before the covid-19 pandemic occurred. The next recommendation is for providers to make contraceptive services free (12.8%).

IV. DISCUSSION

The findings of this study are around 11% of married women have difficulty accessing contraceptive services during the COVID-19 pandemic. The intervention carried out in this study was able to increase respondents' knowledge about family planning and reproductive health. However, there are still obstacles in implementing online interventions, namely a need to prepare quotas to access information provided online, and often have signal problems, and have to adapt communicating without face-to-face which causes people to not understand the information conveyed.

Access to contraceptive services has been affected by the COVID-19 pandemic in almost all countries [1,3,20]. The COVID-19 pandemic requires restrictions on all activities, including family planning and reproductive health services [10]. UNFPA estimates that 12 million women in 115 low- and middle-income countries are unable to access family planning services as a result of the COVID-19 pandemic, which has resulted in 1.4 million unwanted pregnancies [21]. In Indonesia, unwanted pregnancies reached 20.3% [7].

Efforts to ensure that family planning acceptors do not experience discontinuation of contraception and invite married women to use contraception during the COVID-19 pandemic are through telehealth or telemedicine. Family planning counselors and

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health workers must be able to take advantage of this information technology. With the help of information technology, family planning officers can provide services whenever needed [22].

Indonesia is currently developing community-based telemedicine that can reach the entire community. Through the Ministry of Health, Indonesia is trying to develop a telemedicine platform to open the widest possible access to safe, comfortable, and quality health services for all citizens. This program is called SehatPedia [23]. Although Indonesia has a society with internet access and the most smartphone users, in remote areas there are still groups of people who do not have internet access. In addition, from a social and cultural perspective, especially in a community that has close family relationships, there are still many clients who prefer face-to-face consultations. The socio-cultural shift from traditional consultation to teleconsultation will take time, especially in rural and remote areas. Therefore, most of the teleconsultation of family planning officers and clients is mostly used by urban communities [24].

Internet use requires a quota that must be purchased by the public to access the internet. Meanwhile, the COVID-19 pandemic has had a major impact on the people's economy, which has reduced people's purchasing power, including internet quotas [25]. Currently, internet quota assistance is provided by the government to help distance education provided by the Ministry of Education and Culture to students, university students, and educators. [26]. This is a challenge that needs to be solved by the government by cooperating with the private sector.

This study also revealed that some people expect direct contraceptive services. According to the guidelines for family planning and reproductive health services during the COVID-19 pandemic, it is stated that face-to-face meetings can still be carried out by implementing health protocols and for clients who have complaints or are unable to use contraception without helping of family planning officers. [8].

The next recommendation based on the results of this study is that the community hopes that contraceptive services are free of charge. This needs to be socialized by family planning officers that the cost of contraceptive services is borne by the government, and the national family planning coordinating board is committed to making contraceptive services free during this COVID-19 pandemic. [27].

V. CONCLUSIONS

Based on the findings of this research, the challenges of family planning and reproductive health information technology in Indonesia are that first, Indonesia has remote areas that are difficult to access the internet and there is a social-cultural perspective that is reluctant to use the internet; second is high poverty rate which affects the purchasing power of people, including the purchase of internet quota.

Contraceptive services are prioritized to be carried out online but can be done directly by coming to the provider by implementing health protocols and is intended for people who have complaints or are not able to use contraception without helping of family planning officers. Officers need to inform the public about the cost of contraception that can be claimed by the Health Social Security Agency and free contraception from the national family planning coordinating board.

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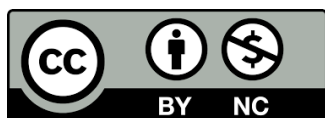
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Housewives' Entrepreneurial Strategy from Islamic Economic Perspectives in Rural Areas of Donggala Regency in Indonesia



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ABSTRACT: This study aimed to determine the entrepreneurial strategy of village housewives in the Donggala district from the perspective of Islamic economics. The research was conducted using qualitative methods, and data collection was carried out through observation and in-depth interviews with several housewives who are entrepreneurial. Data analysis techniques used are data reduction, data presentation, and data verification. The results showed that the entrepreneurial strategy carried out by housewives in Donggala Regency was by changing the menu and adding products according to the wishes and needs of buyers. The product's price prioritizes the social aspect, namely by not taking much profit. Places, where products are sold, are marketed directly to buyers, such as selling in front of the house or to markets close to the local community. However, some products are also sold indirectly, namely by entrusting their products to kiosks. Meanwhile, promotion is done by selling directly and through social media (Facebook). Judging from the Islamic economy, the entrepreneurial strategy carried out by housewives is more focused on trading with Islamic ethics that is halal and beneficial and does not make much profit. Entrepreneurial mothers also always keep their business premises clean and promote products that can be accounted for. The entrepreneurial strategy of housewives is also carried out by paying attention to the nature of shiddiq or being honest in trading by not increasing or decreasing the size of the product. Then the women traders also behave in a trustworthy manner in serving buyers and fathanah with mutual respect between family members, employees, and buyers. Submission of information about the product is also carried out with tabligh or product promotion carried out honestly and correctly.

KEYWORDS: Entrepreneurship, housewives, rural economic, Islamic economic

I. INTRODUCTION

Indonesia is the fourth largest country in the world in terms of population (Kurniawan, Sugiawan, & Managi, 2018). The large population is one of the advantages when viewed from a market perspective to support industrial development in the country (Gallup, Sachs, & Mellinger, 1999). It can be a great strength if human and economic resources are developed properly, one of which is in the Islamic economy. Indonesia as the largest Muslim population country also gets benefits from the fast-growing population to support Islamic economic development.

Islamic economics is a social science that studies people's economic problems guided by Islamic values (Zaman, 2009). The Islamic economic system is an economic system oriented to *rahmatan lilalamin* or for the benefit of all humankind. The Islamic economic system is also known as economic related to banking aspect, but the scope of its language on Islamic economics includes the real sector as well as trade, plantations, agriculture, marine, fisheries, and small industries. All kinds of business are part of Islamic economics. Islamic economics mostly focuses on economic problems guided by Islamic values (Furqani, Adnan, & Mulyany, 2020).

The desire to be able to meet the needs of daily life is one of the factors that motivate people to look for decent work (Xu, Liu, & Tang). However, current conditions show that many people are competing to find work and the intense competition in job selection makes many people excluded, one of which is a housewife. Seeing the competitive conditions in the world of work, therefore many housewives look for work in various ways, one of which is entrepreneurship to meet the many needs of the family.

For a Muslim, work is an earnest effort by directing his assets and remembrance to subjugate the world and placing himself as part of a society where humans work to humanize themselves because work is a dynamic activity and has a goal to fulfill certain needs and in achieving goals. Muslims are ordered to strive earnestly to achieve optimal performance (Derks, van Laar, & Ellemers, 2006).

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To meet the needs of life to be prosperous, people who have the ability and are observant to see their potential and can identify the environment will be able to find opportunities to open businesses. In addition, it is necessary to support business success, namely the existence of a strategy in entrepreneurship. Strategy is a set of actions designed to match the company's competence and external demands on the industry (Grant, 1991). The need to develop a strategy is to achieve company goals, both in the medium and long term. The strategy will ensure the company can survive or thrive.

In Donggala Regency, there are several large companies, one of them is Nasional Oil Company and then local mining companies which employ a large number of residents in the district. So that housewives in the Donggala district see opportunities for entrepreneurship to meet family needs. In addition, the success of business actors is primarily determined by the products they produce in providing satisfaction from the specified target consumers. In other words, marketing efforts carried out in entrepreneurship must be directed at consumers who want to be targeted as their target market.

In Donggala district, there are eight forms of business carried out by housewives such as mixed kiosk businesses, cooked vegetable sellers, yellow rice sellers, putu sellers, bread sellers, vegetable sellers, cooked noodle sellers, and fried food sellers. The various forms of business carried out by housewives aim to meet the needs of their families. However, no research has been conducted to find out whether the entrepreneurship carried out by the housewife is in accordance with Islamic teachings or not. Whereas research related to the compatibility of entrepreneurship with Islamic economic values needs to be carried out to provide a correct understanding of the implementation of economic activities in accordance with Islamic teachings. Therefore, this research was conducted to provide an understanding of the economic activities of housewives from the perspective of Islamic economics. The results of this study are expected to be a guide for Muslim women in entrepreneurship.

II. LITERATURE REVIEW

A. Entrepreneurship

Entrepreneurship is a science that examines the development and development of the spirit of creativity and dares to take risks for the work carried out to realize the results of the work (Steyaert, 2005). Entrepreneurship comes from the word effort, namely activities by mobilizing energy, mind, or body to achieve a purpose; work to achieve something. Mars & Rios-Aguilar (2010) define entrepreneurship as follows:

An entrepreneur is a person who creates a new business by taking risks and uncertainties to achieve profit and growth by identifying opportunities and pooling the necessary resources to establish them.

Based on the above understanding, it is concluded that entrepreneurship is a business activity carried out by individuals or groups to achieve certain goals by looking at the opportunities and resources needed and daring to take risks. One of the keys to success in becoming an entrepreneur is a strong motivation for entrepreneurship. Motivation to become someone useful to oneself, family and society through achievement of work as an entrepreneur. If someone believes that the business they are going to be in is very meaningful for their life, then that person will fight harder to succeed.

B. Strategies of Entrepreneurship

Business strategy is a variety of efforts made so that the business that is run can achieve its goals effectively and efficiently to get maximum income and success in the long term (Schwartz & Davis, 1981). Every company needs a business strategy if the business or company wants to develop and advance in the conditions of business competition in an increasingly advanced global world. Determining a business strategy is something that must be done by entrepreneurs and companies. Without the right approach, a business or business will have difficulty surviving in market competition. It is to and achieves success, it is necessary to develop a strategy so that the business is carried out continues, including:

a. Strategy at the start of the business

This strategy is about designing and introducing a new product. Therefore, what needs to be done is to analyze and observe the market situation and community needs. It is intended that the goods and services offered are in accordance with and receive positive responses from consumers.

b. Strategies in capturing market opportunities

This strategy relates to your steps in reading or creating business opportunities, whether they come from your ideas, other people's ideas, situations that arise, or a combination of these three things. Some people succeed in building their business thanks to the ability to see the weaknesses of their competitors' products.

c. Innovation strategy

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The innovation in question is concerned with the ability to design ways to find or create something unique, interesting, creative, and become a solution to something that consumers need.

d. Market targeting strategy

This strategy is related to efforts to fight over potential market gaps. A follow-up to careful planning, especially when there is intense competition in business. It is necessary to make observations and predictions that might appear and become competitors to prepare.

In entrepreneurship, it is undeniable that an entrepreneur's products (goods/services) are intended for sale, not for their consumption. Because the goal is to sell, the ability of an entrepreneur in terms of handling the marketing of his products will determine the success of his business. Many research results prove that the problem experienced by companies, especially those managed by novice entrepreneurs, is the difficulty of marketing their products. The ability to produce products (goods/services) well has no meaning if it is not supported by success in marketing. The product becomes useless because it does not reach the consumer, so the company suffers a loss because it has incurred high costs to produce the product but does not earn income from the sale of its products.

C. Islamic Economic in Entrepreneurship

Working or trying is the maximum effort made by humans, either through the movement of the limbs or the mind, to increase wealth, whether carried out as a company or collectively, either for individuals or for others (by receiving a salary).

Islam views that exist to work and try include entrepreneurship, an inseparable part of human life because humans are encouraged to try and work hard as a form of realization of the human caliphate. Working and trying is something that must be done to meet the needs, both the need for clothing, food, and shelter because Islam views time must be used as best as possible to do business. As the word of Allah SWT who ordered their people to work or strive contained in (Surah Al-Jumu'ah [62]:10):

فَإِذَا قُضِيَتِ الصَّلَاةُ فَانْتَشِرُوا فِي الْأَرْضِ وَابْتَغُوا مِنْ فَضْلِ اللَّهِ وَاذْكُرُوا اللَّهَ كَثِيرًا لَعَلَّكُمْ تُفْلِحُونَ ۝ ١٠

The translation:

When the prayer has been performed, you will be scattered on the earth; seek the bounty of Allah and remember Allah a lot so that you are lucky.

Based on the verse above, it is also shown that after humans perform prayers, they should seek Allah SWT givings, and to seek these gifts, humans must try. Gifts and sustenance from Allah do not just come and go. Allah has given favors in the form of the five senses, physical, intellect, and so on, to be optimized by humans as best as possible. By doing the best you can, Allah will give you this sustenance and gift. This will not come to humans who sit around doing nothing.

III. METHODOLOGY

This study employed a qualitative case study (Yin, 2003). We studied an Islamic bank practice of corporate social responsibility and the customers' perception. Data were gathered through direct observation, in-depth interviews, and written document analysis. In-depth interviews (Nurdin, 2021; Nurdin, Stockdale, & Scheepers, 2014) involved the Islamic bank staff and its customers. The interviews were between 30 to 45 minutes and they were tape-recorded. After that, the interviews were transcribed and then returned to the interviewees for confirmation (Ermawati, Musyahidah, & Nurdin, 2021; Pribadi & Nurdin, 2021).

Data were collected through Focus Group interviews, in-depth interviews, direct observation (Ermawati, Rahmani, & Nurdin, 2021). Written materials from the elementary schools were also used to analyze the case (Nurdin, 2019). Data analysis consists of several procedures, which included reduction and verification techniques with various data sources (Nurdin, Pettalongi, & Yusuf, 2018). The data analysis also follows Strauss and Corbin's (1998) grounded theory approach. The data were analyzed through three iterations; open, axial, and theoretical coding. The results of the analysis were presented in a matrix (Miles & Huberman, 1994) according to themes found in the data. Finally, the themes that emerged from the data were presented and discussed in each section of the results of this paper.

The reduced data is then analyzed, reflecting on theoretical concepts used in this study. The results were presented based on thematic issues found in the data (Rusli & Nurdin, 2021), which show the insight of the study relating education character based on religious teaching within the elementary schools. In this study, we interviewed and observed 50 Muslim women entrepreneurs in the Donggala regency.

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IV. RESULTS AND DISCUSSION

A. Housewives in Entrepreneurship

Based on the results of research conducted in the Donggala regency, that is the reason that housewives choose entrepreneurship because they want to fulfill family needs. Some factors were found to influence housewives entrepreneurship includes:

Environmental factor

Environmental factors were found to have influenced housewives to practices business. The environmental factors provide opportunities for women to sell their products. The opportunities include the existence of mining companies where many employees work in the companies. The mining industries have attracted more residents to live in the surrounding areas, giving rise to opportunities for trading to meet women's daily needs. The companies National oil companies such as Pertamina and Elnusa, Pertamina Training & Consulting (PTC), Palu Batu Madu, Sinar Mutiara Megalitindo, and Tri Putra Arba Mandiri. A woman trader said as follows:

Based on 2016 data, when compared with temporary data in 2021, this village has experienced an increase in population because there are mining and quarrying companies, there are also many migrants who after marriage settle and work in this village, there are also migrants who come to work. and they have to stay here.

The number of housewives who have been involved in small business trading is increasing. Currently, there are fifty women are trading in the village surrounding the companies' areas. The trading housewives were identified in the following table 1, but their names were replaced with initials for confidential purposes as suggested by Amiruddin (Amiruddin, Nurdin, & Ali, 2021).

Table 1. Housewife Traders And Products

No.	Initials Name	Business Form
1.	Mrs. Nova	Groceries
2.	Mrs. Andini	Groceries
3.	Mrs. Rahma	Groceries
4.	Mrs. Sukmawati	Groceries
5.	Mrs. Ratna	Groceries
6.	Mrs.Cima	Groceries
7.	Mrs.Mega	Groceries
8.	Mrs. Hj. Jayati	Groceries
9.	Mrs. Agnes	Groceries
10.	Mrs. Naca	Groceries
11.	Mrs. Warni	Groceries
12.	Mrs. Novayanti	Groceries
13.	Mrs. Masita	Groceries
14.	Mrs. Yanti	Groceries
15.	Mrs. Minakasti	Groceries
16.	Mrs. Sahwiya	Groceries
17.	Mrs. Nana	Noodles
18.	Mrs. Juleha	Noodles
19.	Mrs. Fatmina	Noodles
20.	Mrs.I pa	Noodles

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21.	Mrs. Salma	Noodles
22.	Mrs. Darna	Noodles
23.	Mrs. Ita	Noodles
24.	Mrs. Nuryanti	Cooked food
25.	Mrs. Pira	Cooked food
26.	Mrs. Asma	Cooked food
27.	Mrs. Roma	Cooked food
28.	Mrs. Sinar	Cooked food
28.	Mrs. Ida	Yellow rice
29.	Mrs. Dewi	Yellow rice
30.	Mrs. Hj. Asni	Yellow rice
31.	Mrs. Deliana	Yellow rice
32.	Mrs. Juri	Yellow rice
33.	Mrs. Meri	Yellow rice
34.	Mrs. Aliyati	Cooked gluten rice
35.	Mrs. Lima	Cooked gluten rice
36.	Mrs. Ulfa	Cooked gluten rice
40.	Mrs. Wilda	Fried food
41.	Mrs. Puput	Fried food
42.	Mrs. Hawa	Fried food
43.	Mrs. Warni	Traditional bread
44.	Mrs. Radia	Traditional bread
45.	Mrs. Romi	Traditional bread
46.	Mrs. Saniha	Cooked vegetables
47.	Mrs. Muriani	Cooked vegetables
48.	Mrs. Muria	Cooked vegetables
49.	Mrs. Reni	Cooked vegetables
50.	Mrs. Moni	Cooked vegetables

The high needs of the family are often the reason for a housewife to seek additional income. In addition to helping husbands in meeting family needs, the decision of housewives to work is also caused by the lower husband's income which is considered insufficient to meet family needs. A participant commented as follows:

Twenty-four years ago, my husband's job was a fisherman, and his income was 50,000 rupiah a day (about 3 UD dollars). Meanwhile, after we got married, our needs began to increase because we were going to have children. So I took the initiative to save little by little from my husband's income to begin a small business in front of our house. At that time, I was selling snacks for the children, and there were not enough kiosks in the past. Until now, I still sell and have a kiosk.

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Almost all informants experienced the same thing where their family's needs were increasing and their husbands' income was still lacking. Their husbands' inability to generate sufficient income affects women's participation in work. Even, if their husbands' income is still not able to meet the family's needs, the women will work more to help meet their families needs. However, when the amount of family income is relatively large, the decision of married women to work becomes relatively small. The husbands' income in the Village is uncertain, especially for men who do not have permanent jobs or who do not have jobs at all or housewives who no longer have husbands. A trader widow said:

It's challenging if we work like this, but what can we do? My husband died a long time ago, and I have a son to care for. Like it or not, I keep selling so I can eat. My son helps me to sell. Usually, he goes to the market to shop for what we want to sell. At least we can still eat and pay for my son's schooling.

A husband's income level plays an important role in women's decisions to enter the labor market. It also explains that housewives in the Village decide to work because their husbands' income is insufficient to meet family needs. Women's participation in work depends on the husband's ability to generate income. If the husband's income is still unable to meet the family's needs, the wife will work more to help meet household needs.

Habit factor

Working as a trader has been passed down from generation to generation from family to successor and has become the majority phenomenon. A housewife trader said as follows:

I always helped my mother by selling yellow rice when I was little, so when I was married, I wouldn't be surprised anymore because it's my job to help my husband, and it's been more than 20 years since my mother was around now and I'll continue. I also teach my children to sell this way from elementary school to high school now. Usually, when I go to a party to help people, or I'm tired after making yellow rice, I tell my son to sell it. So there is no need to bother or the children feel shy to the name of selling.

Business strategy is a variety of efforts made so that the business is carried out can achieve its goals effectively and efficiently to get maximum income and success in the long term. Every company needs a business strategy to improve the business in a high competition environment. Determining a proper business strategy is an important concern of a company or small business unit. In entrepreneurship, it is undeniable that the products produced by an entrepreneur are intended for a hot sale. The ability of an entrepreneur to handle the marketing of products will determine the success of a business (Ardichvili, Cardozo, & Ray, 2003). The entrepreneurial strategy carried out by the housewives in marketing their products has supported their ability to run their small businesses continually.

The products sold by the women were a set of tangible and intangible attributes, including color, price, name of the manufacturer, good name of the stores, and better services to satisfy their customers. The women sell various types of products, such as cooked food, raw food (vegetables), and packaged food according to the communities needs. An informant said:

I am selling cooked vegetables because I liked to cook and my family said my cooking was delicious. Then my family suggested trying to sell the cooked vegetables where my husband works because there are no food stalls here. I cooked various foods for sales, such as white rice, corn rice, tomato sauce fish, grilled fish, *moringa* vegetables, *palumara* vegetables, and others. Sometimes I change the menu so that buyers don't get bored.

The informant's statement above shows the strategy of product selling where the trader changed the food menu on certain days with the aim to keep buyers interest. From an economic perspective, the strategy is called product diversity to retain customers' interests (Sukpanich & Rugman, 2007). Another informant also said as follows:

At first, I only sold cooked noodles and *binte* (corn soup), but after six months, I took the initiative not only to sell cooked noodles and binte. From the profits of selling cooked noodles, I made savings. The capital I have accumulated was used to buy other goods, such as buying snacks, packaged drinks, and household needs.

The informant's statement shows that she applied a product variety strategy (Menrad, 2003) in her small business trading. The strategy helped the woman trader to attract more buyers. As such, she was able to make more profit to support her family. The strategy for selling products can be done in various ways, either by changing the menu on certain days, adding products, or adding flavor variants. The goal is to keep the business running and increase sales to get more profit.

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Price is one of the important aspects of marketing activities (Pappas, 2017). Price is the amount of money given up in exchange for goods or services. Pricing is very important because the price offered can affect consumer interest (Garbarino & Lee, 2003). Consumers will see if the product offered has a good taste and quality, then consumers will not repeatedly think to buy the product, and vice versa. An informant justified as follows:

One of the strategies that I did was the lower price. The price of bread that I sold was very affordable, which was 1,000 rupiah (7 cents) apiece. In addition to the low price, the public can enjoy the delicious taste of bread. Sometimes if we sell the bread with a price of 2,000 rupiahs a piece, it was not sold well, so I made the bread according to the size and price according to the purchase ability of the buyers. I sold Fried foods with an average of a thousand rupiah apiece, while the small ice blender I also sold one thousand rupiahs a cup. I did not make much profit, the important thing is the products were sold well.

The participant comment reflects that she was a mixed kiosk seller who is very careful in determining prices because the communities in the village are customers with price-sensitive (Khojasteh & Jadid, 2015). She has a principle that even though she earns a small profit, her products were sold faster which can raise capital turnover faster (Li, Sun, & Montgomery, 2011). Compared to making a lot of profit, there are fewer buyers and slow capital turnover.

Products distribution can be a direct or indirect channel (Kurata, Yao, & Liu, 2007). The direct distribution channel does not have any direct intermediaries that move from producers to consumers. Indirect channels of distribution have one or two intermediaries between producers and users. In terms of distribution, the business locations used by the housewives were quite strategic because they were right on a highway where many companies' employees used the way. The distribution channel was also quite smooth because many consumers make purchases every day. To market their products, several housewives distribute their products by selling directly to buyers. An informant said as follows:

When it's late, I make my yellow rice. After that, I sold it on the terrace of the house after evening prayer. Every night the yellow rice is sold out. Sometimes if it doesn't sell out, I put it back in the rice heater to sell it again in the morning. In the morning, I also go shopping at the market to buy vegetables such as lemongrass, banana, coconut, spices, tomatoes, etc. From morning until noon, I sell at home by opening a kiosk. In the afternoon, I get ready to go selling at the night market again.

Promotion is another strategy that aims to introduce goods or services to consumers by explaining the objectives and functions as well as the benefits that can be provided to consumers (Bin Yusuf, 2010). Many local people buy directly from the housewives' traders, both from the village and neighboring villages. This was disclosed by an informant as follows:

For regular promotions, it's only through people who buy *putu* (sticky rice cake) and my son selling the phone. I'm an old woman and it's impossible to use a Smartphone because my eyes are not healthy. If there is no night market, I usually sell my cooked vegetables at my house because my neighbors were also selling this way, they came to ask and buy.

Some housewives use social media to promote their sales, for example using Facebook. As one informant said as follows:

The way I promote sales is by using Facebook. Instead of Facebook for narcissism and to see people's status, I'd rather use it for promotions selling fried foods and pop ice. Then when I finish making bread, I also tell my children to promote bread on Facebook because I don't know how to use social media properly. So if someone orders it, I or my son will deliver it. I only serve for close orders.

The use Face book as a promotional tool has become a major concern in business promotion (Berger; Mas, Arilla, & Gómez, 2021; Nurdin, Stockdale, & Scheepers, 2013). The women traders understand that social media can function as an effective marketing tool in their small business process. The women traders also added a delivery fee for delivery outside their villages. As such, they were not disturbed by the cost of delivery.

B. Islamic Economic Perspectives on Housewives Entrepreneurship

According to Islamic economic principles, entrepreneurship activities must be based on the spirit of worshiping God the Creator (Egel & Fry, 2017; Musyahidah, Ermawati, & Nurdin, 2021). Traders are commanded to obey as much as possible for the common welfare, not only for the sake of benefit. Islam is a very extraordinary religion and a complete religion, which means taking care of all things in human life. Islam is a religion that can balance the world and the hereafter, between *hablum minallah* (relationship with Allah) and *hablum minannas* (relationships with humans) (Ermawati, Musyahidah, et al., 2021).

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The Prophet has taught his people to trade by upholding Islamic ethics. In economic activities, Muslims are prohibited from committing false acts. However, they must carry out economic activities with mutual pleasure, as the word of Allah SWT in QS. An-Nisa [4]: 29.

يَا أَيُّهَا الَّذِينَ آمَنُوا لَا تَأْكُلُوا أَمْوَالِكُمْ بَيْنَكُمْ بِالْبَاطِلِ إِلَّا أَنْ تَكُونَ تِجَارَةً عَنْ تَرَاضٍ مِّنْكُمْ ۗ وَلَا تَقْتُلُوا أَنْفُسَكُمْ ۗ إِنَّ اللَّهَ كَانَ بِكُمْ رَحِيمًا ۚ ٢٩

The translation:

O you who believe, do not eat each other's wealth in a false way (not true), except in trade which is based on mutual consent between you. And don't kill yourself. Indeed, Allah is Most Merciful to you.

The Qur'an verse explains the law of transactions in general, more specifically to trade transactions or to buy and to sell a business. In the verse, Allah Almighty forbids believers to eat, utilize, use all other forms of illegal transactions and other people's property in a vanity way, which is not justified by Islamic law. We can make transactions with other people's property by trading for mutual pleasure and mutual sincerity.

Islamic economics is very much needed so that economic actors know the limits of what is allowed and what is not. Everything can be done unless there is a prohibition in the Qur'an and Hadith. When economic actors know that transactions are lawful and transactions are unlawful, it is hoped that justice will occur in all sectors (Mohamed Sanusi, 2008). In terms of selling, every action we do must feel supervised by Allah SWT, and we must trade fairly, trade with lawful and useful products, realize the truth, destroy falsehood, and spread benefits.

V. CONCLUSIONS

The factors that influence housewives to involve in trading were the environment, family economy, level of habit, number of dependents, and working hours. The entrepreneurial strategy carried out by housewives was to keep the business running so that they can fulfill the needs of their families. They changed the menu and add products features according to the wishes and needs of the buyers. The price strategy set was relatively cheap and did not make much profit. They sell their products on the terrace of their houses, on the roadside, and entrust sales to the nearest kiosks. The promotions were carried out through the word of mouth of neighbors and social media.

From an Islamic economic perspective, the entrepreneurial strategy used was in accordance with Islamic values. They sold halal food and useful products. They did not make much profit, and always kept the place of business clean. In addition, the women's business strategy was carried out with *Siddiq* (honest) in selling their products because they did not increase or decrease the size of food portions, trustworthiness in serving buyers, *fathanah* with mutual respect between family members, employees, and buyers. The traders also practiced *tabligh* (deliver right information) in conveying information to buyers without forgetting the value of honesty and truth.

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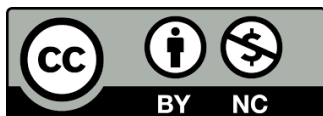
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Adoption of Recommended Beekeeping Practices in Kumaon Hills of Uttarakhand



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ABSTRACT: Beekeeping in Uttarakhand is one of the oldest traditional practices followed both for the commercial purpose as well as the domestic use. It is an important supplementary income generating activity in the state. According to the experts, there is a need to adopt modern beekeeping practices by the traditional beekeepers in the state, especially in the areas like bee management, better extraction, honey storage and quality control. Honey bee farming is now a days becoming more popular due to its market demand in national as well as the international market. The farmers not only obtain economic benefits but beekeeping also helps the farmers increase the agricultural productivity through pollination. Uttarakhand has huge potential for beekeeping due to plenty of flora and suitability of climate but the farmers still depend on the traditional practices resulting in the low yield of honey produce both in terms of quality and quantity. Hence, there is a huge scope of adoption of advanced scientific practices in the state of Uttarakhand that can add to the farmers income in the state. "Mountain farmers in Uttarakhand are facing extreme difficulties in meeting their basic needs because of meager opportunities to engage youth in respectable employment. The paper suggests that the Uttarakhand has tremendous scope for commercial beekeeping and use of bee for pollination of diversity agri-horticultural crops and wild flora. Also, the paper emphasizes on the constraints for beekeeping development and strategies for organic honey production in Mountain hill of Uttarakhand.

INTRODUCTION

Indian agriculture contributes for about 19.9 per cent of GDP and provides livelihood to about 52 per cent of the labour force. More than 50 per cent of the Indian population depends on agriculture and allied activities either directly, indirectly, primarily or secondarily for livelihood. The government of India in its annual budget 2016-2017 set a policy target of doubling the farmer's income by 2022. To double the farmers income there should be an integration of various allied agricultural enterprise together with the crop production system. To double the farmers income, integrated farming system is a good approach which includes allied agriculture practices together with the crop production system. Few allied agricultural enterprises are mentioned as follows Dairy farming, Poultry, Piggery, Dairy, Bee keeping, Sericulture, Mushroom cultivation and Fisheries. An integration of these allied agriculture enterprise minimizes the risk factor associated with agriculture.

One such most important allied agriculture practice in northern hills of India is apiculture, commonly referred as beekeeping. Bee keeping is defined as the scientific method of conservation and rearing of bees for the production of important hive products such as honey, bee-wax, royal jelly, propolis and bee-venom. It is an environmentally friendly and agro-forestry based occupation (Singh and Mishra, 1995). Beekeeping is an important enterprise that involves use of low input and high output sector. Honey is the most important primary product obtained from the beekeeping practices, both from quantitative and economic point of view, and it has been used by the mankind for many years as a source of food, medicine and for cultural ceremonies. Beekeeping has a vast potential for supplementary income generation for the farmers and rural, hilly and tribal populations. It is an excellent source of employment for the rural unemployed. Approximately 2,50,000 farmers in India got employment from beekeeping in the recent past years (Kejriwal, 2012).

India ranks first in number of beehives stocks followed by China in the world and stands at eighth position in terms of World in honey production producing around 95,000 metric tons of honey per annum (NBB, 2016-17). There are several reasons behind this huge gap in availability of beehive stocks and total honey production, one may the partial or no adoption of the recommended beekeeping practice. Out of the total honey production in India, around 61 per cent is contributed by four states viz. West Bengal, Uttar Pradesh, Punjab and Bihar.

Adoption of Recommended Beekeeping Practices in Kumaon Hills of Uttarakhand

Uttarakhand is a land of variety of flora and fauna. Beekeeping forms an integral part of the small holder farming system and plays a significant role as a source of additional cash income in subsistence farming. There are around 2,50,000 beekeeping units in India out of which only 8,700 are in Uttarakhand accounting for about 2500 MT of honey production in 2016-17. Uttarakhand is extremely rich in Bee forage plants but the use of this rich resource is not being made properly (Tiwari, 2010). Around 20 per cent of the Beekeepers in Uttarakhand do not use any medicine for the management of pest and diseases showing that the farmers are not much aware of the advance methods of beekeeping (Khan *et al.*, 2007). Uttarakhand has huge potential for beekeeping due to plenty of flora and suitability of climate. Beekeeping is an ancient practice that is managed traditionally in Kumaon hills of Uttarakhand. Due to the traditional production system the productivity per hive is low in Uttarakhand.

Recommended beekeeping practices:

There is vast potential for beekeeping in the country. However, due to lack of knowledge scientific beekeeping is not being practiced by the beekeepers which is one of the major reasons behind low honey production. In order to obtain high output in terms of the honey produce it is necessary for beekeepers to participate in the trainings and other capacity building programmes to gain scientific knowledge on the subject. Selection of good apiary site, good quality bees and proper management are the main keys for a successful beekeeping enterprise. One should always use recommended methods to control swarming, division of colonies, uniting of colonies, mass queen rearing, stopping laying workers, robbing, desertion, migration, and management of diseases, pest and enemies, etc. The following advisories as formulated by the National Bee Board should be kept in mind for effective and beneficial beekeeping:

A. Selection of good apiary site

While selecting an apiary site one should make sure that the Apiary ground is clean & free from dry leaves. This is important to avoid fire during the summer season. The site should be away from power station, brick kilns, highway and train tracks so that the honey produce obtained may be of good quality. Also, the site should be open and should be rich in bee flora. Fresh running water should be easily available near the apiary and the site should have natural or artificial wind breaks. There should not be any source of stagnant, dirty water, chemical industry and sugar mill, etc., nearby the apiary.

B. Selection of good quality bees

The two most common bee species reared in India are *Apis cerana* and *Apis mellifera* depending upon floral conditions and capability of investments. However, success in both the cases depends on quality of bees, particularly the queen bee. Therefore, certain factors should be kept in mind during the selection of the bee colonies. Only disease-free bee colonies should be bought from existing beekeepers. The Selection and multiplication of the bees should be only from disease resistant, high honey yielding, young, healthy and high egg laying capacity queen. Keep colonies with good prolific queens and capture few bee colonies from their natural abodes in forests which may be used for further breeding/ multiplication to prevent inbreeding.

C. Management of apiary

Apiary management is necessary to obtain good quality of output in terms of both quality and quantity that may result in maximum returns to the beekeepers. Following are few apiaries management practices as advised by the National Bee Board:

Placement of colonies in apiary

The beehive should be as per the specification of BIS/ISI and should be of locally available seasoned light weight wood. Unseasoned and heavy wood should be avoided. Nailing the bottom board with the brood chamber should be avoided and the number of bee colonies in an apiary should be restricted to about 50 to 100 and over stocking of the colonies in apiary should be avoided. The row to row and box to box distance should be about 10 and 3 feet, respectively.

Inspection of colonies

The beekeeper should make sure to adopt general colony and personal hygiene in the apiary like cleanliness in the beehives including cleaning the bottom board, top cover, etc. frequently. The colonies should be checked periodically for any abnormalities or changes in behaviour of the bees. Inspection of the colonies should be made on clear sunny days preferably at temperatures between 20 and 30°C. Beekeepers should avoid inspecting colonies in cold, windy and cloudy days. Smoker should be used whenever needed to subdue the bees and the colonies should be handled gently to avoid jerks. The diseased and the healthy colonies should be handled separately.

Provision of fresh water in the apiary

Water is needed in the apiary for the maintenance of the adequate humidity in the colony to ensure proper incubation of the eggs. When the temperature of the apiary increases, water is used by the bees to evaporate and cool the colonies. Also, for feeding bread by the nurse bee, the mixture of honey and pollen of certain consistency is required for which water is needed

Adoption of Recommended Beekeeping Practices in Kumaon Hills of Uttarakhand

Dearth period management

Dearth period is when nectar flow for honey bee is at minimum, usually when fruits and vegetables have gone from flowering stage to fruiting stage. Provide 50% sugar syrup to the colonies during dearth periods when honey stores in the colonies is not adequate and nectar is not available in the area. The syrup should be prepared by boiling clean water in the vessel and sugar added with slow stirring for few minutes. Cover the vessel with lid and let it cool. Feed cooled syrup to the honeybee. The Sugar syrup should be kept in such a way that the bees should not drown in it. This should be ensured by using shallow vessels with straw to facilitate easy feeding. The feed should not be prepared in the open and dripping of the feed should be avoided on the ground to prevent robbing by bees and ants. Feed the colonies in the evening preferably after sunset. Feeding should be given to all colonies in the apiary at one time. Do not feed colonies with honey or syrup mixed with honey. Pollen substitute comprising of fat free soyabean flour (3 parts) + Brewer's yeast (1 part) + skimmed milk powder (1 part) + sugar (22 parts) +honey (50 parts) made in the form of patties should be provided when pollen stores in the colonies is not adequate and pollen is not available in the area. Provide fresh water near the colony in shallow vessels Extra frames should be stored in air tight chambers and fumigated with sulphur powder regularly. Old and dark combs should be discarded

Care during honey extraction

Honey extractor, containers and other bee hive tools or equipment's made of stainless steel or food grade plastic should be used to extract honey. Equipment's and containers should be thoroughly washed with warm water before honey extraction. Honey should be extract from super chambers only. Frames with only with 75% sealed cells with ripened honey should be used for extraction purpose. Honey should be extracted in a closed room to avoid robbing.

Care during migration

The bee colonies should be migrated during non-availability of flora to areas with abundant flora. Before migration the area must be surveyed to assess the availability of the flora to locate the colonies. The Beekeepers must ensure honey extraction before migration. The entrance gates of the colonies should be closed in the evening after all worker bees are inside the colony. The colonies should be packed internally and externally before migration to avoid jerking. Colonies in the vehicle should be packed in such a way that the entrance side should face the front side of the vehicle. Migration should start late in the evening and ensure the colonies reach the destination within 10-12 hrs.

SEASONAL MANAGEMENT OF APIARY

a) Summer management

During summer season the colonies should be kept in thick shade. The microclimate of the apiary should be regulated by using wet gunny bags over top cover and water should be sprinkled around the colonies in the apiary during noon hours. Proper ventilation should be provided in the colony by widening the entrance gate of the colony, additional gates should also be added to multi chambered colonies, placing thin small stick pieces between two adjacent chambers for the passage of fresh air.

b) Monsoon management

During monsoon the surroundings of the colony must be kept clean by cutting the unwanted vegetation which may hamper free circulation of the air. Artificial feeding (sugar syrup and/or pollen substitute) must be provided to the bees as per the requirement of the colony .

c) Post monsoon season management

Colonies must be provided with sufficient space in the colony. The colonies should be strengthened to stimulate drone brood rearing. The ectoparasitic mites, wax moth and predatory wasps should be controlled before the winter sets in.

d) Winter management

The colonies should be examined and stimulative feeding should be provided to the weak colonies to provide energy and initiate brood rearing. The colonies should be protected from chilly winds by using wind breaks. Unite the weak colonies with stronger ones.

e) Spring management

During spring provide stimulative sugar or pollen substitute to increase brood rearing. To equalise the colonies extra frames should be raised by providing comb foundation sheets. The old queens should be replaced with new ones through mass queen rearing. Honey should be extracted frequently during this season.

Protecting colonies from pesticides

The farmers must be persuaded not to use pesticides or use selective pesticides that are less harmful to bees at recommended concentrations. The use of dust formulations must be avoided as they are more harmful to bees than spray formulation. Prior information to the Beekeepers about spraying would help in reducing poisoning of bees. The farmers must avoid spraying of

Adoption of Recommended Beekeeping Practices in Kumaon Hills of Uttarakhand

pesticides during flowering of the crop and peak foraging time of the bees. This would help in reduction of mortality in foraging bees. Spraying may be done in the evening after sun set when bees do not forage.

Management of honey bee diseases

Honey bees could be affected by a variety of diseases and the real cause of abnormality or any disease present in the honey bee broods need to be ascertained before taking up any control measures. It is best to contact researchers, scientists or the beekeeping experts at the nearest centre or university or government department working on honey bees. After the exact diagnosis of the causal agent of the particular disease, the guidelines or the recommendations given by the expert should be followed in true letter and spirit.

Adoption and stages of adoption

The major goal of the extension community is to get a new or a profitable practice to be adopted by the farming community. Adoption is defined as the decision to make full use of an innovation as the best course of action available. Adoption is essentially a decision-making process. According to Rogers, "adoption process is the mental process through which an individual passes from hearing about an innovation to final adoption". Adoption process occurs at individual level. Wilkening described the adoption of innovation as a process composed of learning, deciding, and acting over a period of time. The adoption of a specific practice is not the result of a single decision to act but a series of actions and thought decisions. There had been always a gap between recommended innovation and their adoption by ultimate users of the technology (Pottappa, K. 2005). The adoption depends on several factors like socio economic, communication and psychological factors which needs to be studied to understand why farmers adopt or do not adopt certain improved practices. The Northern Rural Sociology Subcommittee for the study of diffusion of farm practices 1955 identified five stages of the adoption process, which received worldwide attention.

Awareness: At this stage an individual becomes ware of some new ideas. The existence about the idea is known but the details about the idea is still not know.

Interest: At the interest stage a person wants more information about the idea.

Evaluation: At this stage the individual makes mental application of the new idea to the present and anticipated future situation and decides whether or not to try it. The individual makes an assessment whether the idea is applicable to the situations or not and if applied what will be the results.

Trial: During this stage the individual actually applies the new idea on a small scale in order to determine its utility in own situation. The trial stage is generally characterized by the small-scale experimental use. It may be considered as the practical evaluation of the innovation.

Adoption: This final stage in the process is characterized by large scale, continued use of the idea, and most of all, by satisfaction with the idea. Being satisfied with the trial and considering the pros and cons of the situation, the individual takes the final decision and applies the innovation in a scale appropriate to own situation on a continued basis.

These five stages are not necessarily a rigid pattern which people follow. There can be jumping from one stage to the other. In terms of beekeeping if the farmer has confidence in the extension worker or the scientist recommending an advanced practice, the beekeeper may jump from the evaluation to the adoption stage.

IMPORTANCE OF ADOPTION OF RECOMMENDED BEEKEEPING PRACTICES IN KUMAON HILLS

In India honey bee pollination services have been reported to increase the yields and quality of many important cultivated crops owing to which beekeeping has emerged as an important component for sustainable development of agriculture and horticulture system. Total area of bee dependent crop for pollination is about 55 million hectare and 200 million colonies are needed to meet this, while at present only 1.8 million colonies are present (NBB, 2017). Hence there is a huge potential for the beekeeping in India. Uttarakhand has huge potential for beekeeping due to plenty of flora and suitability of climate. Beekeeping has a huge potential as a supplementary income generating activity, still it is underutilized in the state. Several constraints which lead to under production of honey in hilly area includes; long dearth period, limited credit supply and subsidy, high cost of supplementary bee feed, lack of post-harvest and management facilities, marketing of honey and unfixed support price for honey. (Bansal *et al.*, 2013). In Uttarakhand about 17 per cent of the apiaries were found to be infected with more than one disease and beekeepers were not aware of improved apiary disease management practices. Around 20 per cent of the beekeepers did not use any medicine for management of the pest and diseases. (Khan *et al.*, 2007). Traditional beekeeping is widely practiced in hilly areas by the rural people who inherit the tradition from their forefathers and are reluctant to adopt and have no information about modern day practices. Improved cultivation practices when adopted for any crop or enterprise has shown to increase the production substantially (Chourasia, 2011). Though India ranks first in bee hive stocks number, still it ranks eight in terms of honey production, which indicates there is lack of adoption of suitable and recommended improved beekeeping practices.

Adoption of Recommended Beekeeping Practices in Kumaon Hills of Uttarakhand

CONSTRAINTS FACED BY THE BEEKEEPERS IN ADOPTION OF RECOMMENDED PRACTICES

There are several constraints that are faced by the beekeepers in adoption of recommended beekeeping practices. According to Shenkute *et al.* (2012) the low adoption of improved beekeeping technology is because of lack of management and technology development, absence of diversification of bee products (propolis, pollen and other high value of bee products), lack of skilled man power on apiculture to help beekeepers managing honey bees for better production and lack of extension agents. Fikadu *et al.* (2017) in his study reported that around 44 per cent of the respondent's ranked pest and predators as the first major constraint faced by the beekeeper. About 20.5 per cent of the respondents ranked drought as the second major constraint and 13.4 per cent of the respondent ranked lack of bee keeping equipment's and accessories as the major constraints faced by the beekeepers in adoption of recommended beekeeping practices.

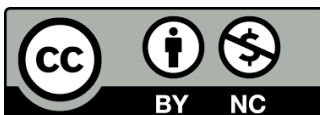
Kumar *et al.* (2020) mentioned in a study that the economic constraints for non-adoption of improved beekeeping practices include lack of subsidiary, shortage of financial resources for purchasing raw materials and lack of knowledge about facilities of loan for purchasing raw materials. Arya *et al.* (2021) also came up with some similar results and reported that beekeepers mostly sold their honey directly to the processor. March and April were the most important months from view of level of production and disposal of honey. Unconditional weather and climatic conditions, bee diseases and unfixed price of honey were major problems faced by the beekeepers.

CONCLUSION

There is a vast scope of adoption of recommended beekeeping practices in Kumaon hills of Uttarakhand. Adoption of these practices will help to increase both quality as well as the quantity of honey which will ultimately add to the farmers income. To accomplish this, various research institutions are required to be enabled to conduct studies toward Innovation and adoption of recommended beekeeping practices. Also, relevant studies should be conducted with respect to the appropriate innovative technological packages for farmer conditions to solve current apiary related problems. There is an increasing demand for honey all around the globe as well as in India. Uttarakhand being a home to a large number of floras can be a good source of nectar flow for the reared honeybees resulting in good average honey production and therefore, beekeeping can result in good supplementary income generation. The native tribal population of Uttarakhand generally practice the traditional methods of beekeeping which results in poor honey yields. These traditional practices should be upgraded according to the climatic suitability of the hills and farmers should be encouraged to adopt the new advance practices to increase honey production.

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Covid19 Pandemic Affected the Industry of Health and Wellness Tourism (Japanese Onsen)



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ABSTRACT: 'Health & Wellness Tourism' and aims to plans to discover the principle effects of Coronavirus to the Wellbeing and Health the travel industry in Japan, and how the Japanese Wellbeing and Health The travel industry has figured out how to defeat the obstructions. With time elapsing, and understanding that the infection didn't vanish, society began to live with it. Social separating rules, better ventilation frameworks and required veil wearing began to be the new-typical. Particularly, in exercises like Japanese underground aquifer (Onsen), the utilization of Onsens by the Japanese is an extremely exceptional social and social peculiarity on the planet's Onsen culture. Be that as it may, because of the Covid19 pandemic emission, the Japanese onsens industry, which has been on the decrease for a long time, is being impacted more. What Japanese government have comes up is to re-began their organizations work, restricting the quantity of clients to try not to spread the contamination. . As more offices shut with an enormous shortfall, the Japanese government concocted an arrangement called "Go to Travel." This mission is tied in with getting up to half of the installment in the event that we reserve a spot for a home grown outing to Japan during the mission time frame through travel services and travel sites. That way it could help the wellbeing and health the travel industry to rise once more, and not impacted by the pandemic.

KEYWORDS: Health and Wellness Tourism, Japan, Covid19, Tourism Industry, Hot spring

1. INTRODUCTION

'Health & Wellness Tourism' and aims to find out the main impacts of COVID-19 to the Health & Wellness tourism industry in Japan, and how the Japanese Health & Wellness Tourism industry has managed to overcome the obstacles. In 2020, one event disrupted the life of millions of people all around the globe. The Covid-19 pandemic, after one year is still creating issues and as for February 2021, more than 107 million people were infected with the virus (WHO, 2021). Different responses were taken in the country that got infected by the virus outbreak, such as national borders closure, lockdowns, state of emergency, use of face masks and social distancing rules. The unprecedented situation created major economic losses, and the travel bans that affected over 90% of the world population hit tourism industry the hardest (Gössling, Scott, & Hall, 2020). The main response of Japan to the pandemic was the closure of international borders, as of February 2021, to 152 countries and regions of the world (Ministry of Foreigners Affairs, 2021) reducing the inbound tourism of 97, 7% from 2019 (JBT Tourism Research & Consulting Co, 2021). Various states of emergency have been put in place for 11 prefectures, without mandatory lockdowns or businesses closures in a method to keep Japanese economy afloat. With time passing, and realizing that the virus didn't disappear, society started to live with it. Social distancing rules, better ventilation systems and mandatory mask-wearing started to be the new-normal. In Japan, businesses re-started their work, limiting the number of customers to avoid spreading the infection.

In the report various activities, both physical and cultural, will be discussed and analysed to determine their importance on the wellbeing of the person, and how they were affected by the covid-19 pandemic. The wellness industry is estimated to be a 1.9 trillion dollar market where people travel because they want to maintain or improve their health condition. The main content of this paper will focus on the use of Onsen (Hot spring) under the Covid19 pandemic.

2. THE HISTORIES OF JAPANESE ONSEN

The Japan Onsen Association founded the organ paper "Onsen" in 1930, and as a medium for sharing various information and research results on Onsens, it actively promoted and encouraged the use of hot springs by tourists looking around. In addition,

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the development of tourist attractions, which prioritize success over medical and nursing use for citizens, will accelerate in accordance with the Onsen tourism strategy centered on the railway. In other words, modernization into 'commercial Onsens' takes place. Since the 1960s, Japan has entered a period of high economic growth. With the explosive increase in domestic travel and the attempt to expand the capacity of Onsens to accommodate them, traditional Onsens are gradually urbanized due to the expansion of lodging facilities and the discovery of new Onsens. The remarkable development of this period is the foundation of modern "tourist" Onsens. The most significant change in the history of Onsen culture in Japan is the production and consumption boom of the 'Onsen boom', especially open-air bath, which took place around 1985. As a result, large-scale accommodation facilities by large capital will be prepared, and open-air baths will be newly prepared in almost all Onsens (Kim, 2020).

The Japanese Onsens have been changed and developed in conjunction with the folk beliefs and recreational needs of the Edo period, and the growth of modern capitalism based on the basis of Touji. Of particular note in this process is the rich culture that Japan's Onsens have cultivated for a long time in order to survive as a box office, and accommodations for tourists who come to see the unique natural scenery of Onsens that out of active volcanic activity, as a health spa resort, there are a variety of cultures, such as the creation of the landscape, the arrangement of buildings conscious of the visitor, the daily life related to the Onsens, and giving meaning to various folk beliefs and oral traditions, customs and folk arts, etc. It can be said that it gives true value as a tourism product (Hwang, 2012).

3. JAPANESE ONSEN RESTRICTION DURING THE COVID PANDEMIC

The use of Onsens by the Japanese is a very special social and cultural phenomenon in the world's Onsen culture, as seen on TV in famous Onsen sites and newspapers and magazines. The unusual love of Onsens by the Japanese is already close to faith, and it can be seen as having a lot of arguments and reaching a blind level. Japan's Onsens sites were developed with the involvement of popular "tourism" that was different from the revitalization of Western medical and medical use, starting with treatment or therapy called Touji in Japanese. The activation of Onsens treatments called "Cuamiterhouse" or "Terme," which are covered by health insurance today, is deeply related to the history of using onsens based on Touji (Hwang, 2012). With the various restrictions and the social distancing regulations left a lot of individuals confined to their homes, resulting in social isolation that can lead up to mental problems such as anxiety and depression (Kato, Sartorius, & Shinfuku, 2020). Such as, there is even a prospect that half of the Japanese onsens could disappear in the future." Japan's tourism industry has also contracted significantly since CoVID-19. Among them, the Japanese onsens industry, which has been on the decline for several years, is being affected more. For example, Nishi-Wakamachi, Iwate Prefecture has 10 onsens facilities co-run by villagers. The annual cost of maintaining ten onsens is 150 million yen. Villagers have shared the burden, and as the deficit has worsened recently, seven out of ten places have been put up for sale.

According to the Japan National Tourism organization (JNTO) announced on January 25 2021, the number of foreigners visiting Japan in April 2020 was 2,900, down 99.9% from the same month last year-on-year, can be seen in Figure 1.

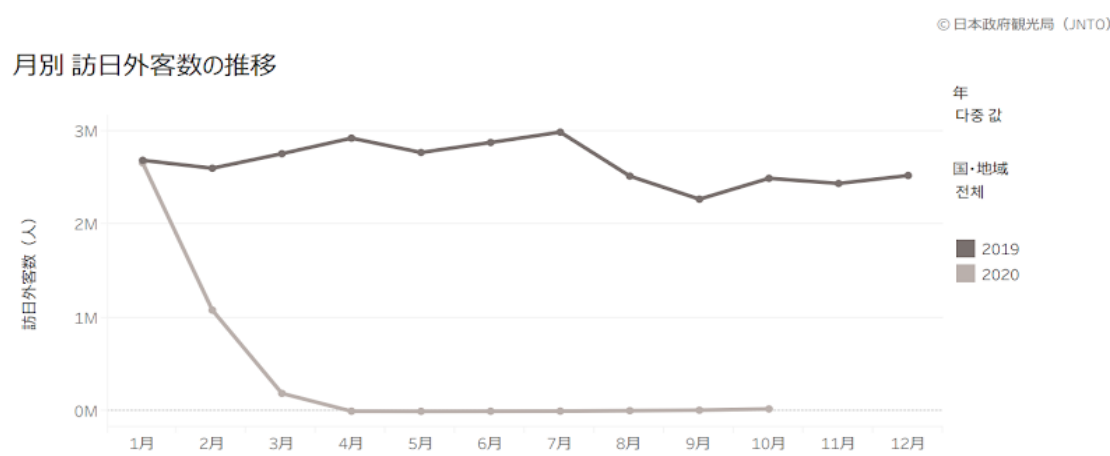


Figure 1: Japan National Tourism Organization, (2021)

This is the minimum since 1964 when JNTO began to tally the number of foreigners visiting Japan. Along with the number of foreigners visiting Japan, the number of hotels and other guests has declined sharply since February. At the "Tomorrow's Tourism Vision Conference to Support Japan" held in 2016, the goal was set at 40 million foreigners visiting Japan in 2020, but it is hopeless to achieve the goal due to entry restrictions and the postponement of the Tokyo Olympics due to the spread of CoVid-19. The

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spread of Covid-19 has dealt a major blow to the lodging industry around the world, but Japan's expectation of attracting more tourists and guests through the hosting of the 2020 Tokyo Olympics is particularly more affected.

4. SOLUTION OF JAPANESE ONSEN UNDER THE COVID PANDEMIC

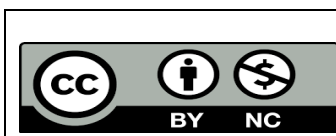
As more facilities closed with a large deficit, the Japanese government came up with a policy called "Go to Travel." This campaign is about receiving up to half of the payment if we make a reservation for a domestic trip to Japan during the campaign period through travel agencies and travel websites. The upper limit of the amount of support is up to 20,000 yen per night. It's a maximum of 10,000 yen for one-day trips. 70% of the amount supported is given as a regional common coupon for travel discounts and 30% of the remaining purchases of local food, tourism facilities, or souvenirs (Go to [トラベル事業とは](#), 2021). Only those who participate in the Go-to-Travel campaign (travel, accommodation, transportation, etc.) meet the absolute conditions of preventing the spread of new COVID-19 infections (such as thorough condition checks on travellers and tightening measures to prevent congestion). For those who participate and use it as travellers, it is necessary to check and implement the [New Etiquette of Travel]. We should avoid large-scale banquets or group trips of young and elderly people who are prone to seriousness. Above all, it is important to think about and act on your own in order not to expand the infection.

5. CONCLUSION

To conclude, in the health and wellness tourism, these kinds of activities were chosen because of their traditional Japanese culture background. The covid-19 pandemic shifted their market to national residents or to online operations. These adjustments in the period of necessity showed how with new ideas they can be still practiced and implemented for the future. Although, the accommodation industry is still struggling due to the rapid drop in tourists due to the spread of Corona 19, but there is still a potential demand for foreign tourists, and various attempts are being made under the keywords "automation" and "non-contact" in the 2021 Tokyo Olympics. Not to be mention, some solutions were found. Virtual reality and digital implementation helped consumers and businesses in these times. The in-person contact shifted toward an internet-related one. Events started to take place online, allowing people to join them from the comfort of their houses. Where the , technologies such as automation were being developed to reduce the burden on employees in the lodging industry, which has been highly dependent on manpower since the past, and the reduction of fixed costs has emerged as an important task for each accommodation. In addition, robots are drawing attention again as a way to solve both fixed-cost cuts and Covid-19 measures at a time when Covid-19 measures have added tasks that have not been done so far. In the case of robots, it is also useful to reduce the risk of infection in a non-face-to-face manner, which is expected to increase demand in accommodations in the future (Satoshi, 2020).

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Learning of Knowledge Graphs with Entity Descriptions



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ABSTRACT: The representing learning makes specialty of knowledge graph and it indicates the difference between different entities. The knowledge graph representing with the low-dimensional space. In fact, most of the method usually concern of description of entity which is hard for existing strategies to take benefit of. Here, we recommend a new representing learning method with knowledge graphs that uses entity description. We evaluate our method on two tasks like knowledge graph and entity classification. Experimental effects on actual-world datasets show that our version plays higher than different baseline fashions, especially under the zero-shot setting, which indicate that our technique for novel the entity description.

INTRODUCTION

The indication of the Knowledge graph technique is based information including web search, question answering, and understanding graphs (KG) could not be imagined without them the ideal expertise graph generally represents understanding as multi-relational facts, and additional triples which is referent to as the entities (Jia et al., 2022). The primary effects are based on the symbolic identity of the people advocate with different kind of diverse kinds of knowledge graph (Bellomarini et al., 2022; Z. Li et al., 2021).

The length of Knowledge graph strategical representing the infeasible on the big KG due to the computational inefficiency and sparse dataset. The trouble of this is resolve by the illustration of representing the learning graph for KG which has been proposed to KG and it including each entity with knowledge graph inference and acquisition (Pham et al., 2022).

In parent, we display the descriptions of entities in a fact triple taken with rich semantic information about the entities. The vital base of understanding the base maintained with different dialogues and attitudes (Shao et al., 2021). Likewise, we indicate the few descriptions with two entities in fact of triple sampled from the entitle by web.

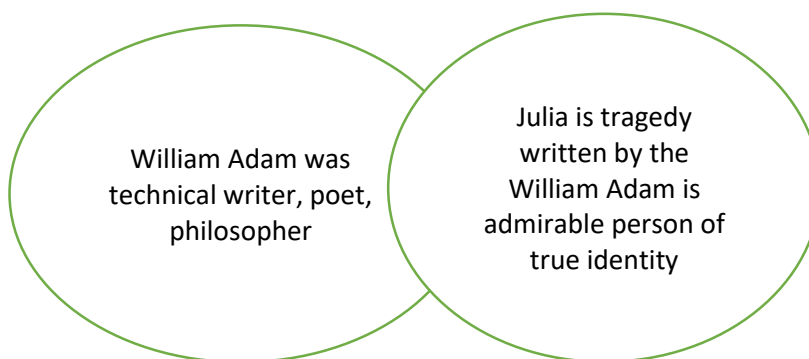


Figure 1: Entity description by web

In this case, the based information is conducted by web. The William Adam character shows the writer, poet and philosopher, Julia determined his personality as an admirable and true identity (J. Li et al., 2022). For instance, in this description the basic strategies aren't always trivial for the knowledge graph and representing the learning graph but the shows the strategies to make use the entity instance (C. Li et al., 2021).

In the description embodied knowledge representing learning (KDAL(CBOW)) model the indicated test is responsible for the both modeling the corresponding fact of triples and description of model. The embedded ding of business entity is liable for each

Learning of Knowledge Graphs with Entity Descriptions

making the proper version triple and making the model of its definition. In reality threefold (Tiddi & Schlobach, 2022), we comply with the standard RL technique. The look at 3-dimensional relation as a translation from the top to the tail commercial enterprise with different entity. In this manner, initiative embedding and relationships are studied to growth the possibilities of this translation (Yu et al., 2021). At that point of research implications, within the business case, we are able to additional identify to boom the variety and possible probabilities of predicting its meaning. In this instance, we conducted two codes to represent the semantics of term of business, including a rapid continuous bag-of-words and deep version of structure. Comparatively, version assumes the phrase order that is stress structure of phrases inside the sentence context which is consider for the application of bag-of-words (Bellomarini et al., 2022).

We analysis the co-effectiveness of the description embodied knowledge representing learning in two different tasks, which is consisted of the computation of the graph and enterprise classifications. The descriptive results shows that the description embodied knowledge representing learning model is surpasses the lawsuits of the artificial intelligence for those features, especially we consider the scenario of bit zero shot, where the knowledge graph existence the representing the learning strategies in the novel entities (Wang, Hao, et al., 2020; Zhao et al., 2020). In this case the existing representing of learning methods of knowledge graph don't realize those novel entities, as no embedding have been learning in them. However, the description embodied knowledge representing learning can routinely structure of these novel entities of the descriptions. The assessment of 0-shot settings displays that description embodied knowledge representing learning model, which can nonetheless get better effectiveness of different capabilities (Q. Li et al., 2020). This demanding structure demonstrates the brilliant integration and durability of description embodied knowledge representing learning model, that is crucial to the huge knowledge graph scale and its overall performance of the website (Zhao et al., 2021).

WORK ORIENTATION

The work orientation has been distributed in the variety of ramification of ways to model facts this is carefully associated with statistics graphs, a lot of which encode each commercial enterprise and relationships in a low-dimensional low vector continuous velocity (Huang et al., 2021). The relationship capabilities among the key companies and with a low-vector space determined as

$$E(ha, r, te) = ||ha + r - te|| \dots \dots \dots (1)$$

In the Eq 1 the indicator represent the translates relationships as translation capabilities among key companies and the tail within the space of a low-vector vector. The power function is described as $E(ha, r, te) = ||ha + r - te|| \dots \dots$ indicating that the tail should be nearest neighbor of $ha + r$. The E properly is indicated one to one intersection as the same time as having troubles modeling relationships from the model relationship and exposing ha and te to hyperplane precise relationships vessels (Bai et al., 2021). It's a version of different type of the organizations and in term relationship in one of kind semantic business and surroundings projects from the enterprise area to the relationship space while to solve the E problem by description of model and as hyperplanes and exposing ha and te a kind semantic relationships and business projects with proposes a consultant mastering model based totally on multiple steps in phrases of approach (Lampropoulos et al., 2020).

Many present RL-primarily based translation strategies for KGs awareness best on structural understanding between organizations, regardless of which rich coded information in business descriptions. moreover, because of the restrict on the representation of the business representation, these fashions also cannot assure three times if as a minimum one enterprise is outside the KG. However, this case may be dealt with thru our KDAL (CBOW) model. There are several approaches to use textual statistics to help examine KG illustration. (Socher et al. 2013) pro represents NTN and represents the commercial enterprise as a widespread for the embedding of its names at the enterprise name, allowing for the sharing of textual facts determined in comparable commercial enterprise names. (Wang et al. 2014a) combines business embedding and word embedding in a continuous vector technique with alignment modeling models the usage of Wikipedia business names or anchors. (Zhong et al. 2015) expands the incorporated version and aligns facts and textual content embedding with business definitions. these two capabilities constitute new agencies using the embedding of related commercial enterprise names (Tiwari et al., 2021). Represents companies with commercial enterprise names or a fee of word embedding in descriptions. however, their use of definitions ignores the phrase or definitions, and the use of company names is elaborate and ambiguous (Ko et al., 2021). Moreover, in the case of a easy, insignificant case, the embedding of recent commercial enterprise names is regularly missing in education information. Our model can at once create presentations from descriptions to avoid such troubles, now not just to use commercial enterprise descriptions as extra statistics.

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PROBLEM FORMULATION

We first introduce the texts used in this paper. when given three $ha, r, te \in G$ while $ha, r, te \in E$ represents agencies and $r \in R$ represents relationships (Shi et al., 2020). E is the commercial enterprise set and R is the relationship set. G stands for schooling set. Every enterprise and related embassy take prices in R_k

Description The building structure represent primarily based presentations of the h_s and G_s are the structure-based representation for head to similar that studied in translation-based fashions along with transformation of E (Wang, Ji, et al., 2020). In other case the based presentation of h_e and G_e descriptions based totally on the definition of head and tail constructed with business descriptions. we will propose codes to construct this type of presentation within the next phase(Sun et al., 2021).

Approach

if you want to observe each definition of 3-dimensional records and the definition of a commercial enterprise and a good way to address a meaningless scenario, we endorse the forms of commercial enterprise displays, structure-based presentation and definition-primarily based displays (Tao et al., 2021). We examine the totally display the carry out three intense as tons as knowledge graph in statistics, whilst descriptive reports do better with capturing textual facts in enterprise descriptions. We examine two commercial enterprise shows concurrently within the equal vector non-stop method, but do not force the shows to be blended to don't forget the potential to better represent (Tao et al., 2021). The description embodied knowledge representing learning is function is then described as

$$E = E_D + E_G$$

Where the E_D is indicating the energy function of the structure-based representation strength function, which stocks the same path as of Eq1, while E_G is representing the energy function of description-based representation(Nicholson & Greene, 2020). And it can be described in an expansion of methods. The E_D getting to know system with E_G as follows:

$$E_G = E_{GG} + E_{DG} + E_{GS} \dots\dots\dots(2)$$

The Eq 2 is indicating E_{GG} with $||h_G + r - t_G||$ where to integrate the The pinnacle and tail are shows primarily based on definition. We also have $E_{DG} = ||h_G + r - t_s||$ and $E_{GS} = ||h_s + r - t_D||$, in which one of the h or t makes use of a descriptive representation of determined techniques and its totally illustrated the alternative makes use of a structure representation. The energy feature will show varieties of business presentations within the same vector with associated shows assigned to all 4 kind of energy features, in order to have the same advertising among the two kinds of displays. on this paper, we advise encoders to create descriptive presentations within the following paragraphs (Tang et al., 2021). First, we endorse the wallet encoder for commercial enterprise constructing, then we propose the convolutional neural network codec to higher recognize the textual records (X. Zhang et al., 2021).

In case of brief description, it produces a set of broad keywords that are to capture the basic identical ideas. The relationship cannot be detected by structural information by CBOW, so therefore the top identical keywords in each business as TF-IDF with including measure key (Gharaee et al., 2021). We imply the keywords with commands

$$E_d = x_1 + x_2 \dots\dots + x_n$$

Where x_n is the insertion of the word th which is part of the keyword business e, and E_d will be used to reduce ED. The figure is interpreting the CBOW encoder by

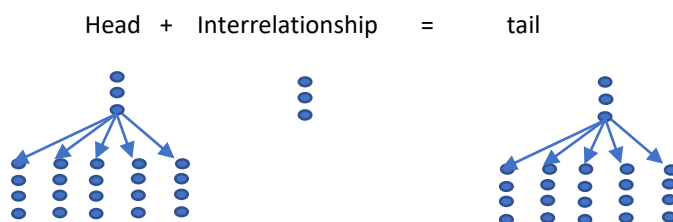


Figure 2: Encoder of CBOW

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Encoder Convolutional neural network is an efficient model widely used on image and proven to be effective on some natural language processing tasks such as part-of-speech tagging, chunking, named entity recognition and semantic role in the model. Since CBOW has the shortage of ignoring the information of word orders and is easy to be influenced by the quality of keywords extraction(Ke et al., 2021; Riba et al., 2021).

Initialization of the descriptive model

In this structure the CBOW and CNN connectors take blank texts like embedding and business embedding as output to minimize imitation of the homework mentioned above. In order to maximize efficiency, we also use CNN's multimedia version to read presentations(Lee et al., 2021). The general backward rotation using a stochastic gradient descent (SGD) with the Rear propagation will be prevented if it meets a zero finish or the current value of the feature was not considered in the compilation during the forward broadcast(Lee et al., 2021).

Dataset experiments

In the Settings Datasets on this paper, we undertake a dataset extracted from a normal large-scale kingdom Freebase to assess with KDAL (CBOW) model and classify the affirm that every entity should have description for the illustration mastering. We categories and put off 56 entities from FB15K that have shorter than 5 phrases after preprocessing or maybe have no descriptions, and cast off all triples containing the ones entities. The average wide variety of words in descriptions is 76 after preprocessing, and the longest description includes 453 words. The remaining education set has 483,960 with 1482 relationship and identical test based on 64,904. Randomly we identify the 3554 new entities from the candidates that in experiments. With 6 identical shapes the dataset is highlighted.

Table 1. Dataset

Dataset	R	Ent	Training	Validity	Results
FEB15KA	1482	14578	584576	483960	64904
FBA20KE	194561	64904	208542	126542	213

We use implanted structure of CNN by educate the ones fashions relation measurement within the CBOW Encoder, we try a exceptional variety of top N keywords and select the pinnacle 20 keywords to create enterprise bedding to do our exceptional. Also, we try to additionally set the width with 75 graphs of the datasets (Table 1).

Table 2. Results

Metrics of datasets	Ranking means with Raw	Filter	Raw	Filter
Etrans	345	320	54.7	57.9
KDAL(CBOW)	328	120	25.9	32.9
DKLR(CNN)	130	109	34.7	54.9

Table 2 is indicated results of ranking mean of raw and filter with KDAL (CBOW) and DKLR (CNN), where the significant outperforms CBOW and mean rank.

Table 3. Relationship prediction

Datasets	Raw	Filter	Raw	Filter
Etrans	3.25	3.22	54.3	60.9
KDAL(CBOW)	3.21	3.19	45.6	67.4
DKLR(CNN)	3.10	2.54	34.6	87.7

Table 3 is indicated that CNN representation. We randomly divided it right into a schooling set and a test set, the training set by the above tables(J. Zhang et al., 2021). We use Logistic Regression as classifier and to make some other comparison, we use the conventional text feature (BOW) function as a base. Subsequent trying out.

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All the descriptive older models based on structural presentation cannot cope with this situation because they are not able to represent businesses outside the KG. However, the KDAL(CBOW) model is naturally aware of this situation(Lu et al., 2021).

We use DKLR(CNN) to emulate the trivial situation that all businesses that are KG businesses can be trained through training, and view CBOW as our foundation as all existing models that use structural-based presentations are not able to represent new businesses. It shows that even in the simplest case, the KDAL(CBOW) model can still obtain positive results compared to the completion of the information graph(B. Zhang et al., 2021). However, there are still discrepancies between the two presentations that will weaken performance, compared to the parallel models of CNN and CBOW that use descriptive representation of all businesses.

It is effective considers enterprise definitions by way of mastering illustration, while there is specific information such as courting information or business types that can be introduced to our version.

INFERENCE

Work in this paper, we suggest a KDAL(CBOW) version to symbolize the reading of graphs of enterprise definitions. We're trying out two encoders that include a continuous phrase bag and a deep convolutional neural community to generate semantics for business definitions. Inside the checks, we tested our model in two obligations that included know-how graph of completion and commercial enterprise classification. Test effects show that our model achieves higher overall performance than other foundations in both operations specifically in the insignificant context, demonstrating the potential for constructive displays from enterprise descriptions. we will discover the following studies hints inside the future: (1) The KDAL(CBOW) version most effective considers enterprise definitions by way of mastering illustration, while there are 2664 specific information such as courting information or business types that can be introduced to our version(Romanov, 2021). We can be able to enhance with that wealthy expertise in the future. (2) We verify the validity of the definition-based submissions handiest through TransE, and it is not tough to similarly evaluate the most superior extension fashions.

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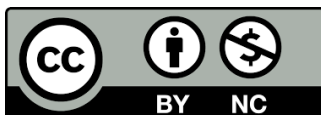
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Readiness for Self-Directed Learning Among Students of Bachelor of Science in Nursing Program of Selected Colleges in Kathmandu, Nepal



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ABSTRACT : Self-Directed Learning (SDL) is a process in which the learner takes self-initiation for assessing own learning needs and work accordingly with the help of available resources for achievement of required learning, The objective of this study is to identify the readiness for self-directed learning among the Bachelor of Science in Nursing (BSN) students. A descriptive cross sectional study was conducted among BSN students of Yeti Health Science Academy and Kantipur Academy of Health Science, Kathmandu, Nepal. Complete enumerative sampling technique was used in this study where 107 students were involved. Questionnaire method with SDL scale was used for data collection. Most of the respondents 74(69.2%) had high level of readiness for self-directed learning and 33(30.8%) of respondents had low level of readiness for self-directed learning. The association between academic year with the level of readiness for self-directed learning were statistically significant ($p=0.045$) whereas the association between other variables (age, ethnicity, religion, marital status, family type and residence) with the level of readiness for self-directed learning were statistically insignificant ($p>0.05$). It is concluded that depending upon the academic year, seniors are more ready towards self-directed learning than junior nursing students.

KEY WORD: Self-Directed Learning, Readiness for SDL

I. INTRODUCTION

Self-Directed Learning (SDL) is a process in which individuals take initiative, with or without help of others in diagnosing their learning needs, formulating learning goals, identifying human and material resources for learning, choosing and implementing appropriate learning strategies and evaluating learning outcomes [1]. SDL is the most commonly used method in adult learning practices. For the better outcomes, SDL is considered to be associated with the management of lifelong learning. It is more of learner-centered instead of instructor-centered in which learner determines what, how, where and when to learn. SDL provides learner to be responsible, self- confident, manage learning with planning and be self-controller until the result of decision made, improved skills of learning and self-evaluation [2].

Although this method seems to be new in teaching learning process at modern era, it had been existed since classical period of education system. Even in colonial America, there was lack of formal educational institutions where many people had to learn by their own ways. Formally, self-directed learning had taken place about 150 years ago in the United States [3].

There are different methods to develop the readiness to learn among nursing students through the appropriate assessment of their learning needs. The appropriate assessment includes informal conversations, focus group discussion, case studies, pre-tests, self-administered questions and observations [4].

While doing survey among 142 Saudi students from nursing and emergency medical services undergraduate programs, it was found that SDL level positively influenced students' academic performance [5]. In Australia 407 students of three years of Bachelor of Nursing program had mean of the total self-directed learning readiness with 159.27 (SD 14.62). It is found that overall students in the later year of their degree had significantly higher scores of SDL than first year [6].

Due to the complexity and changes in nursing profession development, self- directed learning has become a focus for nursing education in past few decades [7]. Nurses have to work in multifaceted healthcare settings where they have to face constant challenges from the ongoing social and scientific changes in the healthcare field. Hence, the responsibility of nursing education is to support and prepare for those challenges so that they can successfully adjust and respond in such healthcare field for which self-directed learning can be one of the very effective ways [8].

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II. METHODOLOGY

A. Methods

A descriptive cross sectional study was conducted among the students studying Bachelor of Science in nursing program.

B. Sampling and Setting

Non-probability, enumerative sampling technique was used among 107 students. The study was conducted in Yeti Health Science Academy and Kantipur Academy of Health Science, Kathmandu which are affiliated to Purbanchal University of Nepal.

C. Instrumentation

Structured self-administered questionnaire was administered which consisted two parts:-

Part I: Socio-demographic Data

Part II: Self-directed Learning (SDL) scale

Self-directed learning scale for nursing education was developed by Murray Fisher, Jennie King and Grace Tague in 2001. It comprise of three dimensions i.e. self-management, desire for learning and self-control. It has 40 items with 5 point Likert scale which means it has 200 scores in total.

D. Data Collection

The researchers obtained permission to collect data from two nursing college authorities. After then questionnaires were distributed to the students and collected soon after the students filled up the questionnaire.

E. Data Analysis

The collected data was coded and then entered in IBM SPSS 20 version. The data was analyzed in terms of descriptive statistics i.e. frequency, percentage, mean, standard deviation. Similarly Chi-square was used to measure the association between respondents' readiness level for SDL with socio-demographic variables.

III. RESULTS

Table 1. Socio Demographic Information of the Respondents

N=107		
Variables	Frequency	Percent
Age (years)		
16-20	73	68.2
21-25	34	31.8
Mean age 20years		
Ethnicity		
Janajati	40	37.4
Madhesi	4	3.7
Brahmin/Chhetri	63	58.9
Religion		
Hinduism	96	89.7
Non Hinduism*	11	10.3
Academic year		
BSN 1st year	36	33.6
BSN 2nd year	36	33.6
BSN 3rd year	35	32.7
Marital status		
Unmarried	104	97.2
Married	3	2.8
Family type		
Nuclear	94	87.9
Joint	13	12.1
Residence		
With family	70	65.4
Hostel or Rented	37	34.6

* Buddhism, Christianity

Readiness for Self-Directed Learning Among Students of Bachelor of Science in Nursing Program of Selected Colleges in Kathmandu, Nepal

Table 2. Distribution of Response of Respondents for Self-management
N=107

Items	Strongly Disagree F(%)	Disagree F(%)	Neutral F(%)	Agree F(%)	Strongly Agree F(%)	Mean ± SD
I solve problem using a plan.	0(0)	3(2.8)	27(25.2)	63(58.9)	14(13.1)	3.82 ± 0.684
I prioritize my work.	5(4.7)	0(0)	15(14.0)	68(63.6)	19(17.8)	3.90 ± 0.857
I do manage my time well.	4(3.7)	7(6.5)	41(38.3)	48(44.9)	7(6.5)	3.44 ± .860
I have good management skills.	1(0.9)	10(9.3)	53(49.5)	40(37.4)	3(2.8)	3.32 ± 0.722
I set strict time frames.	1(0.9)	20(18.7)	51(47.7)	33(30.8)	2(1.9)	3.14 ± 0.770
I prefer a plan my own learning.	0(0)	2(1.9)	35(32.7)	55(51.4)	15(14.0)	3.78 ± .705
I am systematic in my own learning.	1(0.9)	6(5.6)	38(35.5)	54(50.5)	8(7.5)	3.58 ± 0.753
I am confident in my ability to search out information.	0(0)	3(2.8)	25(23.4)	66(61.7)	13(12.1)	3.83 ± 0 .666
I set specific time for my study.	2(1.9)	15(14.0)	37(34.6)	39(36.4)	14(13.1)	3.45 ± 0.954
I am self-discipline.	1(0.9)	4(3.7)	14(13.1)	60(56.1)	28(26.2)	4.03 ± 0 .795
I am organized.	0(0)	11(10.3)	28(26.2)	47(43.9)	21(19.6)	3.73 ± .896
I am methodical.	1(0.9)	5(4.7)	60(56.1)	38(35.5)	3(2.8)	3.35 ± 0 .660
I can be trusted to peruse my own learning.	0(0)	5(4.7)	26(24.3)	58(54.2)	18(16.8)	3.83 ± 0.758

F: frequency

Table 2 shows the response of students for self-management in which the item 'I am self-discipline' have highest mean ± SD (4.03 ± 0 .795) whereas the item 'I set strict time frames' have lowest mean ± SD (3.14 ± 0.770).

Table 3. Distribution of Response of Respondents for Desire for Learning
N=107

Items	Strongly Disagree F(%)	Disagree F(%)	Neutral F(%)	Agree F(%)	Strongly Agree F(%)	Mean ± SD
I need to know why.	1(0.9)	0(0)	14(13.1)	65(60.7)	27(25.2)	4.09 ± 0 .680
I critically evaluate new ideas.	1(0.9)	6(5.6)	30(28.0)	60(56.1)	10(9.3)	3.67 ± 0.762
I learn from my mistakes.	1(0.9)	0(0)	8(7.5)	39(36.4)	59(55.1)	4.45 ± 0.717
I am open to new ideas.	0(0)	1(0.9)	18(16.8)	66(61.7)	22(20.6)	4.02 ± 0.644
When presented with a problem, I can resolve I will ask for assistance.	1(0.9)	5(4.7)	39(36.4)	50(46.7)	12(11.2)	3.63 ± 0.783
I like to evaluate what I do.	0(0)	1(0.9)	11(10.3)	70(65.4)	25(23.4)	4.11 ± 0.604
I do enjoy studying.	2(1.9)	4(3.7)	42(39.3)	44(41.1)	15(14.0)	3.62 ± 0.843
I have a need to learn.	0(0)	1(0.9)	18(16.8)	63(58.9)	25(23.4)	4.05 ± 0.664
I enjoy a challenge.	1(0.9)	1(0.9)	27(25.2)	62(57.9)	16(15.0)	3.85 ± 0.711
I want to learn new information.	0(0)	0(0)	7(6.5)	52(48.6)	48(44.9)	4.38 ± 0.609
I enjoy learning new information.	0(0)	1(0.9)	6(5.6)	57(53.3)	43(40.2)	4.33 ± 0.626
I like to gather the facts before I make a decision.	0(0)	0(0)	21(19.6)	64(59.8)	22(20.6)	4.01 ± 0.637

F: frequency

Table 3 shows the response of students for desire for leaning in which the item 'I learn from my mistakes' have highest mean ± SD (4.45 ± 0.717) whereas the item "I do enjoy studying" have lowest mean ±SD (3.62 ± 0.843).

Readiness for Self-Directed Learning Among Students of Bachelor of Science in Nursing Program of Selected Colleges in Kathmandu, Nepal

Table 4. Distribution of Response of Respondents for Self-control

N=107

Items	Strongly Disagree F(%)	Disagree F(%)	Neutral F(%)	Agree F(%)	Strongly Agree F(%)	Mean ± SD
I am able to focus on a problem.	0(0)	5(4.7)	19(17.8)	71(66.4)	12(11.2)	3.84 ± 0.675
I prefer to set my own learning goals.	0(0)	1(0.9)	22(20.6)	67(62.6)	17(15.9)	3.93 ± 0.634
I am responsible.	0(0)	3(2.8)	13(12.1)	57(53.3)	34(31.8)	4.14 ± 0.733
I have high personal expectations.	0(0)	2(1.9)	39(36.4)	46(43.0)	20(18.7)	3.79 ± 0.765
I have high personal standards.	0(0)	8(7.5)	41(38.3)	48(44.9)	10(9.3)	3.56 ± 0.767
I have high beliefs in my abilities.	0(0)	3(2.8)	34(31.8)	54(50.5)	16(15.0)	3.78 ± 0.731
I am aware of my own limitations.	0(0)	1(0.9)	21(19.6)	51(47.7)	34(31.8)	4.10 ± 0.739
I am logical.	0(0)	5(4.7)	36(33.6)	53(49.5)	13(12.1)	3.69 ± 0.745
I evaluate my own performance.	0(0)	4(3.7)	16(15.0)	65(60.7)	22(20.6)	3.98 ± 0.713
I prefer to set my own criteria on which to evaluate my performance.	0(0)	1(0.9)	27(25.2)	66(61.7)	13(12.1)	3.85 ± 0.627
I am responsible for my own decisions/actions.	0(0)	1(0.9)	9(8.4)	67(62.6)	30(28.0)	4.18 ± 0.611
I can find out information for myself.	0(0)	3(2.8)	25(23.4)	58(54.2)	21(19.6)	3.91 ± 0.734
I like to make decisions for myself.	0(0)	4(3.7)	19(17.8)	57(53.3)	27(25.2)	4.00 ± 0.765
I prefer to set my own goals.	0(0)	0(0)	11(10.3)	60(56.1)	36(33.6)	4.23 ± 0.623
I am in control of my life.	0(0)	4(3.7)	25(23.4)	46(43.0)	32(29.9)	3.99 ± 0.830

F: frequency

Table 4 shows the response of students for self-control in which the item 'I prefer to set my own goals' have highest mean ± SD (4.23 ± 0.623) whereas the item "I have high personal standards" have the lowest mean ± SD (3.56 ± 0.767).

Table 5. Respondents' Level of Readiness for Self-directed Learning

N=107

Level of readiness	Frequency	Percent
Low level (<150 scores)	33	30.8
High level (≥150 scores)	74	69.2

Table 5 shows that 69.2% of the respondents have high level of readiness for self-directed learning while only 30.8% respondents have low level of readiness for self-directed learning.

Table 6. Association between Respondents Level of Readiness for Self-directed Learning with Socio-demographic variables

N=107

Level of readiness			
Variables	Low Level F(%)	High Level F(%)	P-value
Age (years)			
16-20	25(34.2)	48(65.8)	0.264
21-25	8(23.5)	26(76.5)	
Ethnicity			
Janajati	12(30.0)	28(70.0)	0.208*
Madhesi	0(0.0)	4(100.0)	
Brahmin/Chhetri	21(33.3)	42(66.7)	
Religion			
Hinduism	29(30.2)	67(69.8)	0.679*
Non Hinduism	4(36.4)	7(63.6)	

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Academic year			
BSN 1st year	11(30.6)	25(69.4)	0.045
BSN 2nd year	16(44.4)	20(55.6)	
BSN 3rd year	6(17.1)	29(82.9)	
Marital status			
Married	2(66.7)	1(33.3)	0.195*
Unmarried	31(29.8)	73(70.2)	
Family type			
Nuclear	29(30.9)	65(69.1)	0.995*
Joint	4(30.8)	9(69.2)	
Residence			
With family	23(32.9)	47(67.1)	0.532*
Hostel or Rented	10(27.0)	27(77.0)	

F: frequency

* Likelihood Ratio,

Significant at 0.05

Table 6 reveals that there is statistically significant association between academic year and respondents' level of readiness for self-directed learning whereas no any statistically significant association between respondents' level of readiness for self-directed learning and other socio demographic variables i.e. ethnicity, age, religion, marital status, family type and residence.

IV. DISCUSSION

Here mean scores ≥ 150 indicates a high level of SDL, while mean scores <150 represents low level of SDL according to Fisher's et al criteria [9]. In this study, the total score of 69.2% of students had ≥ 150 scores which indicate high level of the readiness for SDL which suggest that most of the respondents were ready for self-directed learning. Somehow similar finding was found in the study by Bajracharya, Jha, Gurung, Ansari and Thapa in which 72.7% students' scores were ≥ 150 scores [10].

In the present study, the association of the level of readiness for self-directed learning with the academic year of students is significant ($P = 0.045$) while the association of the level of readiness for self-directed learning with age, ethnicity, religion, marital status, family type and residence were not significant. Similar findings was found in the study conducted by Ejaz, Afzal, Hussain, Majeed and Gilani among 133 students (2-years BSN Post RN) and (4-years BSN Generic) degree programs which showed that level of readiness for self-directed learning were significant with academic years only [11].

V. CONCLUSION

Based on the findings, it can be concluded that there is high level of readiness in majority of the students of Bachelor of Science in Nursing for SDL. A significant association was found only between academic years of students with the level of readiness for SDL which shows that depending upon the academic year seniors are more ready toward self-directed learning than junior nursing students.

ACKNOWLEDGEMENTS

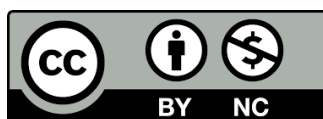
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Combinatorial and Giant Combinatorial Scattering



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PhD, National University of Uzbekistan named after Mirzo Ulugbek

ABSTRACT: This article substantiates the importance of introducing the topic “Raman and giant Raman scattering of light” into the course “Nanophysics”, taught to the students of the Faculty of Physics of the National University of Uzbekistan named after Mirzo Ulugbek. The essence of Raman scattering of light is explained from the point of view of quantum mechanics. Detailed information is given on the polarization, the dipole moment of molecules, and on the Stokes and anti-Stokes components of the spectrum of Raman scattering of light. The reason for the low intensity of the anti-Stokes component of Raman scattering of light is given. New knowledge related to giant combinatorial scattering in nanomaterials will also be discussed.

KEYWORDS: Substantiates, Importance, Raman, Light, Scattering, Anti- Stokes Component, Quantum Mechanics.

INTRODUCTION

It is known that the development of modern technologies is based on the latest achievements of science and science. We all know that without new knowledge, new technologies will not emerge. That is why students studying in higher education institutions must constantly acquire new knowledge. That is why the course of "nanophysics" has been taught at the Faculty of Physics of the National University of Uzbekistan named after Mirzo Ulugbek for 3 years. With this in mind, it is a good idea to include the topic “Combinatorial and giant combinatorial scattering” in the curriculum of “nanophysics”. Well-versed in the nature of the phenomena of combinatorial and giant combinatorial scattering of light, future specialists will have no difficulty in applying the combined spectroscopy of nanomaterials in many fields, such as pharmaceuticals, medicine, biomedicine. The phenomenon of combinatorial scattering can be explained on the basis of classical wave theory of light as well as quantum physics. From the point of view of classical physics [1,2], light is considered to be electromagnetic waves, and molecules are polarized as a result of the interaction of these waves with the environment.

THE MAIN FINDINGS AND RESULTS

Polarization depends on the interaction of the “electron cloud” of atoms with the electric field of electromagnetic waves. In quantum theory, light is thought to be a stream of photons, and scattering occurs when they collide with molecules. The number of scattered photons depends on the strength of the bonds in the molecules. The classical theory of ordinary combinatorial scattering is studied in the optics department of general physics. Before studying the essence of giant combinatorial scattering, we found it necessary to briefly dwell on the quantum theory of combinatorial (Raman) scattering [3,4].

QUANTUM THEORY OF RAMAN SCATTERING

The combination scattering or Raman effect is the inelastic scattering of photons from environment molecules. As shown in the diagram in Figure 1 [4], the light photon awakens the molecule and transfers it to a virtual state. Here, three cases are observed. First, a molecule in the state of the basic zero oscillation level absorbs the falling light photon, emits a new photon equal to its energy, and returns to the ground state. This process represents the relay effect.

Combinatorial and Giant Combinatorial Scattering

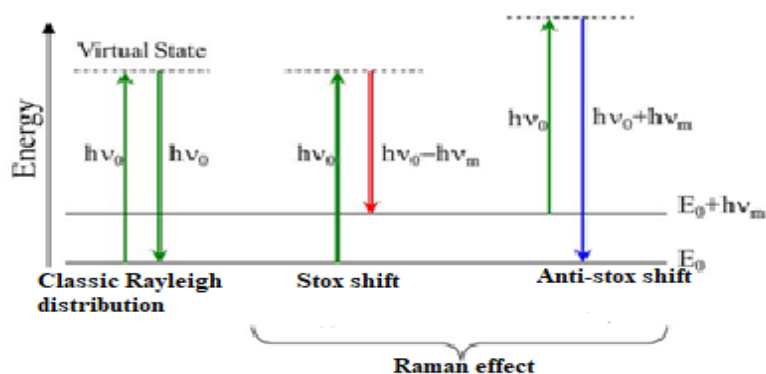


Figure 1. Explain stokes and Antistokes shifts in terms of quantum theory

The second is that the molecule swallows the falling light photon, passes from the ground state to the virtual state, and descends to the first awakened level of the molecule's vibration. In this case, the molecule emits part of the absorbed photon energy as a photon. This process is called Raman scattering. In the third case, the molecule passes from the first awakened state of the phonon to the virtual state and emits a photon with a higher energy than the incident light photon. This effect is referred to as the antistokes shift of Raman scattering. The intensity of the antistokes component of the combination spray is very small. To understand the cause of this condition, let us recall the Boltzmann distribution. It is known that the employment of vibration surfaces under conditions of heat equilibrium is subject to the Boltzmann distribution. According to this distribution, the employment of the surfaces decreases according to the exponent law. At room temperature, the probability of scattering is low because most of the molecules are in the ground state and the occupancy rate in the first awakening state of the phonon is very low. Therefore, the intensity of the anti-stokes spectral lines in the combinatorial scattering (CS) spectrum is much lower than in the stock lines. Typically, the CS spectrum refers to the stock portion of the high-intensity spectrum. As a result, Raman scattering measurements are performed during the stock stock displacement process.

Raman scattering cross section σ_R is determined as follows:

$$\sigma_R \propto \frac{1}{\lambda^4}, \quad (1)$$

Here, λ – the wavelength of the falling photons

The power of scattered light P_s and the intensity of the incident light I_0 linked by the following formula:

$$P_s \propto \frac{I_0}{\lambda^4}. \quad (2)$$

(2) - according to the formula, the intensity of the scattered light is directly proportional to the intensity of the incident light and inversely proportional to the 4th degree of wavelength. Therefore, it is advisable to use an alarm source with high intensity and short wavelength to increase the power of scattered light.

GIANT COMBINATORIAL SCATTERING

The giant increase in combinatorial scattering was first observed in 1974 by M. Fleishman [5]. M. Fleishmann experimentally observed a combination scattering of molecules deposited on an uneven (rough) silver surface. The main goal of the experiment was to increase the number of molecules deposited on the silver surface by increasing its surface area. However, the scattering intensity of the molecules was much greater than expected. In many foreign countries, this effect is known as "Surface-enhanced Raman scattering" (SERS). In 1978, it was found that the proportion of Raman photons in the scattered light of molecules adsorbed on the rough surfaces of metals increased 10^6 - 10^7 times. This phenomenon is called "giant combinatorial scattering of light". In 1997, exotic nanoobjects (their share was 10^{-4}) were found in colloidal solutions of silver nanoparticles (NS). It was found that the number of Raman photons in these nanoobjects increased 10^{14} times. Subsequent investigations revealed that these nanoobjects were a pair of interconnected nanoparticles called dimers. It was also found that the reason for such a fantastic increase in the number of Raman photons was due to the appearance of dimers. In the narrow gap between the dimer nanoparticles, the adsorbed molecule falls into a very large electric field of a specific "nanocondenser". Because the Raman effect is proportional to the fourth level of the electric field, the area of the crack is thousands of times larger than the electric field of the incident light wave. As a result of this increase in the effect, it is possible to measure the Raman spectrum of a particular molecule adsorbed on the dimer.

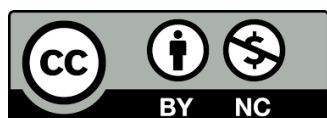
Combinatorial and Giant Combinatorial Scattering

CONCLUSION

Nanoparticles can be thought of as active nano antennas that perform the following functions: receiving an electromagnetic signal; conversion of the signal into surface plasmons; amplification of the signal in the form of a near field in the slit where the dipole is located; receiving the Raman signal of the dipole shifting in frequency, amplifying the resonance, and redistributing this radiation into space. As we know (the topic of “surface plasmon resonance in metal particles”), under the influence of the oscillating external field, the free “electron gas” oscillates and extends exponentially inside the nanoparticle. This phenomenon is surface plasmons. The plasmon resonance of gold, silver, and metallic nanoparticles occur in the visible range of light. The wavelength of surface plasmons is much smaller than the wavelength of light. Therefore, it is possible to compress the electric field inside the slit using plasmas. In this way it is possible to get rid of the ban imposed by physical optics on the size of the focal spot of light.

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Conflict on Natural Resources Management in Mimika District: A Review



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ABSTRACT: This scientific paper is based on a literature study that discusses mining and plantation activities that have the potential to reduce the quality of natural resources and the environment. On the other hand, it is necessary to develop the concept of sustainable development so that the damage caused by mining activities, exploitation of forest and land resources for plantation purposes does not pose a widespread threat to the surrounding natural environment. Forest and land degradation due to the massive use of natural resources requires good solutions to find a way out for the loss of biological natural ecosystems. Scientific studies by developing critical thinking in order to find solutions to problems in the field must be found in order to achieve national development, namely improving people's welfare without sacrificing human beings.

KEYWORDS: mining, plantation, forest exploitation, Mimika district

INTRODUCTION

Development which is a process of change to improve the standard of living of humans cannot be separated from the activities of utilizing natural resources. During this activity, we often encounter human actions that make changes without paying attention to the resulting balance of the ecosystem. The higher the rate of development, the higher the level of utilization of natural resources to be exploited, and the greater the ecosystem changes that occur in the area. Therefore, in planning the development of an ecological system, it is necessary to pay attention to the applicable ecological principles, with the aim of reducing the negative consequences that arise, especially for the development itself.

It is interesting to be discussed in this topic because natural resources are essentially to meet the welfare of the community. On the other hand, forest is a renewable natural resource and Gold is a non-renewable resource. Gold hunting community activities are indeed rife in several places in Timika. As a result of these activities, there have been many changes to the land structure in Timika. The increasing number of mining activities by the community broadly has consequences for the increasing number of green areas that continue to be depressed. Community mining activities that are managed by the community independently in the form of community mining and scavenging gold flakes left over from PT. Freeport Indonesia but some of these activities caused damage to some green areas.

THE CONCEPT OF FOREST AND ITS UNDERSTANDING ACCORDING TO PAPUANS

The definition of forest according to law number 41 of 1999 concerning the Principles of Forestry defines forest as a field of tree growth which as a whole is an association of living nature and its natural environment and is designated by the government as forest. Even the definition of forest in the law above also has perceptions and views in terms of the interests of regional development in Papua which is reaffirmed in the Special Autonomy Law Number 21/2001 article 43, namely: "opening access for indigenous peoples to manage and utilize their forests can giving excessive meaning to both the government, indigenous peoples and investors (Tokede., 2014).

Based on the definition of forest above, the forest in the management system can be viewed from two sides, namely the economic side and the ecological side. The effectiveness of Permenhut 60/2012 concerning Amendments to Government Regulation No. 10 of 2010 concerning changes in Forest Area Functions is doubtful because the Permenhut cannot give different interpretations of the regulations that are hierarchically above it (Nurrochmat. et al. 2014). These two views are implied and

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expressed in the definition of forest more specifically for all community interests in managing forest resources. Forest in the perspective and view of indigenous peoples has a different meaning, namely forest is the mother. Forests play an important role in people's lives, especially in applying cultural values in social life (Salose. et al. 2014). Next up is Salosa. et al (2014) concluded in the results of their research that the right strategy to preserve the forest and to accommodate the interests of the community is expected to be based on the wisdom of the community in utilizing the forest.

This forest view can then be the basis for developing the concept of forest management based on indigenous knowledge. Aspects of traditional wisdom by indigenous Papuans vary from one to another, therefore to find the best format it is necessary to identify and find it in the practice of community life to date, for example with hunting techniques, hunting locations, hunting seasons and hunting targets in the forest (Pattiselano. et al. 2014). Pattiselano et al (2014) add that traditional wisdom is a social, political, cultural, economic and environmental system in the life of a local community that is dynamic, sustainable and acceptable.

FOREST MANAGEMENT SYSTEM

Forest management currently places the community as the subject in implementing a participatory management model. Participatory management is a joint planning process that will characterize a compromise management model (Tyrvainen et al. 2015). One of the causes of low community access to forest use is the construction of policies that are closely tied to the grip of sectoral egoism (Nurrochmat et al. 2014). Next is Nurrochmat. et al. 2014 said that the strong sectoral egoism not only causes biased interests in spatial planning policies, but often also holds the interests of the wider community hostage. Therefore, to ensure the realization of sustainable forest management, a fundamental policy reconstruction of the forest tenure system is needed (Nurrochmat et al. 2014).

On the other hand, there is another opinion that part of natural resource management needs to prioritize the functions and roles of the parties including those who are directly involved in forest management or those who do not have access to unclear management or the emergence of externalities and markets that are not clear. perfect (Gimble & Wellard. 2015). However, the forest management system requires guidance and direction towards a good management model. For example, a community-based empowerment is needed through outreach activities, skills training and assistance to the community in the use of mangrove plants as alternative food that can improve family welfare and empowerment to maintain, maintain and preserve mangrove plants (Fitriah. 2015).

Other forest management ideas to lead to success are by establishing relationships with entrepreneurs through academics who are part of the network so as to encourage entrepreneurs' awareness about the importance of the functions and benefits of mangroves for environmental sustainability and the sustainability of shrimp farming and community livelihoods (Febryano et al. 2014) . Next is Febryano. et al (2014) say that the success of local institutions is very helpful for district governments in the development of rural communities in coastal areas.

Meanwhile, other studies also say that the forest resource categorization system in the Nagari Simanau community (processed, stored and prohibited forests) helps control community behavior in managing their forest resources and has good implications for the performance of forest resources, which is indicated by the high density, number of species, species diversity, and tree volume in reserved and prohibited forests (Hamzah et al. 2015).

COMMUNITY RELATIONS WITH FORESTS

Indonesian people and people in Papua in general have a high level of dependence on forest resources. Forests provide so many broad benefits for the needs of human life. For example: to obtain food sources such as the need for food sources, energy, air and water are provided by the forest. The performance of processed forest is lower, but its economic function as an additional source of livelihood for the community is still maintained. Local institutions that are still trusted and obeyed by the community are effective in supporting good forest resource management. This is indicated by the existence of a management boundary between processed forest, reserves, and prohibitions that have been mutually agreed upon; the existence of rules of the game on the authority to use; and clear sanctions in the enforcement of nagari rules (Hamzah et al. 2015). Another study said that tenure problems in the South Lampung KPH area occurred with the occupation of forest areas by settlements, public or social facilities and shopping centers in the form of a definitive village (Sylvani et al. 2014). Furthermore, Sylvani et al (2014) added that the role of the parties in land tenure in the KPH area is very decisive where the central government that issues policies does not carry out evaluations, especially in area boundaries and inactive permits.

Indigenous peoples are able to protect forests very well within their customary context and understanding of forests (Salose et al. 2014). In the view of the state, it is very, very contrary to the view of indigenous peoples, because there are certain variables and measures that are understood by the state to build its society. For example in a forest management model country with the Timber Legality Verification System (SVLK) which is related to synchronization of rules, coordination, socialization,

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financial support and guidance for small industries as well as assessment criteria for industries that have diverse raw material sources (Gultom et al. 2014). People who live far from the touch of information and communication are considered as marginal communities (untouched by development). So that forest clearing for development in the form of road construction, oil palm plantations or residential development is considered an alternative and a solution to be able to advance the community. The demands and wishes of the government are often not in line with the real conditions faced by the community. Especially the mental readiness of the community to accept change for the sake of change. The government's motivation to open isolation by converting forests can have a psychological impact on the long-standing intimate relationship between the community and the forest.

Sustainable forest management is inseparable from increasing the capacity and standard of living of the community. Cultural and linguistic diversity is also another thing that really needs to be considered in accommodating the concept of sustainable forest management. The relationship between the community and the forest should also be maintained, by providing wise guarantees to keep the relationship between humans and nature in balance. Communities and forests are still seen as a unit in management. Managing the forest means that we also participate in managing the people living around the forest. The conflict resolution offered is to build an effort to "turn conflict into equal partnership", with the following steps: 1) Building trust, 2) Developing an Inter-Village Forestry Forum (FKAD), 3) Preparing a team of experts, 4) Effective communication and 5) mutually agreed regulations (Harun and Dwiprabowo. 2014).

The condition of Papua with so many cultures and languages is unique in itself and at the same time can be a challenge for every stake-holder to participate together in paying attention to forests and their ecosystems. Looking at the natural events that occurred in Wasior, West Papua, the spill of larvae and hot dust bursts in Yogyakarta and the tsunami disaster in Mentawai can provide very valuable lessons for us to look further into our relationship with our nature. Never act after a natural disaster strikes, but it is necessary to think about wise steps as early as possible in managing our natural resources, especially forests.

CONFLICTS OF INTEREST IN MANAGING FORESTS

The position of our country as a developing country is the main reason for the government to optimally manage natural resources in helping to improve people's welfare. On the other hand, as a result, forest degradation is related to occupation and forest tenure conflicts that occur in various areas. Due to conflicts over forest land tenure and occupation by other parties, HPH companies are not active. This condition has invited attention, recognition, and concern from various parties. (Suharjito. 2014). This condition can encourage the government to be able to maximize the potential of its natural resources to be exploited, including forest resources. Forests can make a significant contribution in increasing the country's foreign exchange and increasing PAD.

A country that is moving to build itself is running in an excessively democratic vehicle. Politically, forests can also be used as the main energy to finance political parties. Many of the excuses for forest exploitation are on individual interests and not forest management for state purposes. Power is inherent and exercised through various mechanisms, processes and social relations where mastery of technology, capital, markets, labor and employment opportunities, knowledge, authority, social identity and social relations (bundle of power) will affect the level of access to resources. The greater the power the actor has, the greater his access to these resources (Febryano et al. 2015). People who live in Papua also feel the atmosphere of conflict in the management of forest resources. Regional leaders, both the Governor, the Papuan People's Representative Council (DPRP) and the Papuan People's Assembly (MRP) should be more observant in looking at this conflict issue. The Governor's policy to limit the export of logs outward greatly suppressed the practice of illegal logging on a large scale.

But on the other hand, whether accurate supervision by competent institutions in the region is well established or is there still illegal logging practices that are still hidden. Therefore, good supervision and coordination between institutions and authorized institutions need to be built in synergizing common interests. The application of a restorative justice approach in conflict resolution is actually the use of traditional patterns with conflict resolution values that exist in local cultural wisdom with a focus on fulfilling victims of justice, through the concepts of equality, partnership, reconciliation and participation (Sukardi 2016).

We need to think about this fact and do an in-depth analysis of the demand for wood in relation to the exploitation activities carried out. Communities as forest owners need to be invited together in managing forests. Therefore, the paradigm shift from government to government which underlies the role of government is reduced and the role of the community is increasingly enhanced cannot be applied to the process of forming a Forest Stakeholder Unit (KPH) in Tanah Papua (Yeny 2014). The dynamic urban development in Papua can force people to hand over their management rights to irresponsible third parties. Is the government ready to recommend forest management systems to the community directly? Capital and Expertise are two sides of a coin that cannot be separated. These two factors can be triggers for a prolonged conflict of interest in managing our forests.

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IMPACT OF LAND USE ACTIVITIES ON BIOLOGICAL ECOSYSTEMS

These biological and non-biological components are functionally related to each other and interact with each other to form a system that we often refer to as an ecological system. If there is a change in one of these components, it will be able to affect the entire system in the ecosystem. The sustainability of an ecosystem function greatly affects the sustainability of natural resources as components involved in the system, therefore to ensure the sustainability of natural resources we need to pay attention to the ecological relationships that take place between the components of these resources (Mohri et al. 2013).

The forest in Timika is dominated by swampy forest vegetation, but also a lot of forest on dry land. This community mining activity is indeed very difficult to control by the local government, in this case the Mimika Regency mining office. In terms of contours and topography as well as land suitability analysis, many can be developed into plantation areas. The plantation that is quite developed is Palm Oil. Exploitation activities on natural resources and the environment are carried out individually but also carried out in a corporate manner by involving local governments and third parties in this case the private sector. All of these activities are oriented towards increasing Regional Original Income (PAD). This justification has always been the basis for those in authority. But the facts on the ground show that there has been disorientation so that the main goal is not in accordance with the facts found in the field.

The increase in dry land from mining activities but also the clearing of plantation areas also contributed greatly to the effects of drought and consequently to land marginalization. Marginal lands cause unproductive land to be used for the long term. Planning for the management of forest and land resources is an important agenda that must be agreed together for the sustainability of benefits for the community in the future.

THE CONCEPT OF CONSERVING NATURAL RESOURCES

The concept of sustainable forest is strongly encouraged by the current government at the central level. The joining of the Ministry of Forestry and Environment has a special mission to save forests and land. For this reason, evaluation of the utilization of natural resources, both minerals and forest conversion activities for plantation activities in Timika, needs attention from the local government. The food and energy crisis that is currently being felt by our nation, therefore anticipatory steps to this situation need to be followed up (Ogwu et al. 2014). Cooperation between local governments and higher education institutions to Non-Government Organizations (NGOs) has produced a number of studies but it seems that all of these things have not fully become a roadmap for sustainable development.

The increasing damage to productive lands in Mimika Regency needs to teach a big lesson for all parties to organize and manage forest and land resources more carefully. The long-term implications can have a big impact on the community in Timika in particular but also in Papua in general. The orientation of forestry and environmental development requires that we need to accommodate the principles of sustainable development. When forests and the environment are sustainable, our society will be able to enjoy it in the future.

CONCLUSION

Monitoring and evaluation activities on land and forest use activities are important to be carried out by the government but the private sector in this case invests. The importance of monitoring land use forest activities is an important part that is not considered. Monitoring land use activities will protect our natural resources so that they can be sustainable.

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An Integrated Model to Tackle the Non-Appropriation of Agricultural Storage Facilities by Project Target Communities in Senegal



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ABSTRACT: The storage facilities of agricultural projects are not fully used by Senegalese producers. To appraise the non-appropriation, we used a mixed approach. First, we interviewed fifteen (15) officials and eight (08) farmers' representatives. We identified five (05) clusters of factors: the low production, the project shortcomings, the unfavorable environment, the socio-cultural realities and the storage facility construction. Secondly, we surveyed a sample of seventy five (75) farmers. We found that stores are mainly used for inputs (48%) and cereals (22.7%). Low usage over time (below 6 months for 81.4% of farmers) and space (below 1/3 of the facility for 60% of farmers) derived from the low agricultural production (36%) and cultural habits (28%). We recommend an integrated PASTE solutions (Partnership, Administrative, Socio-cultural, Technical and Economic) model to overcome the non-appropriation of the storage facilities.

KEYWORDS: non-appropriation – storage – project - integrated model –Senegal

I. INTRODUCTION

Developing countries receive considerable amounts of money, usually in the form of development projects from development partners. The World Bank, for example, had financed 568 projects/programs worth US\$56.19 billion in 47 African countries as of March 20, 2017 [1]. However, the impacts of these projects on disadvantaged populations remain limited. The desire to make Official Development Assistance (ODA) more effective has been greatly strengthened [2], particularly through the identification of limiting factors:

- Corruption, poor governance, predatory elites and states [3],
- Poor quality public policies [2],
- Exogenous shocks such as the volatility of commodity prices [4].

The rationalization of ODA will impose the adoption of Results-Based Management (RBM) theorized by Peter Drucker in the 1960s (Managing for results in 1964). RBM gives an important place to the evaluation of projects. The evaluation of project impacts focuses on several criteria, including sustainability, one of the major pillars of which is ownership, which is measured by a feeling of ownership of the innovation and capacities developed by the beneficiaries [5]. However, the beneficiary communities do not generally take ownership of the infrastructure built for them. This lack of ownership is linked to various reasons. The wait-and-see attitude of certain populations who make no effort to develop and monitor development action plans [6] considerably reduces the chances of ownership. Project governance, cumbersome procedures, corruption, activity monitoring and beneficiary support systems can prevent ownership by the populations [7]. Community-based producer organizations (PO) are often limited to seizing opportunities that arise from projects or other programs launched by the state and development partners [8].

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Non-appropriation is very marked for agricultural investment projects in Senegal, where community participation in agricultural projects is often driven by immediate interests (perdiems, participation in national or international events...). As a result, the motivation to sustain the project's results fades as soon as the project stops providing these benefits. This results in the annihilation of the impacts of these projects, especially the works that end up falling into disuse.

One of the most common structures built by agricultural projects is the warehouse, as the storage of harvested grain is one of the most important segments of the agricultural activity. Indeed, it secures the production, rations and income of producers [9]. In addition, the storage of agricultural products fully participates in the supply of markets in sub-Saharan Africa [10].

Depending on the crop, producers use containers (bag, can, drum) and structures (silos, granaries, stores) especially for grains such as maize [11]. The other widespread structures for large quantities of grain are of the aerated type representing 70-80% of storage facilities in developing countries [12]. For the construction of stores, many producers use alternative materials such as banco [13]. Despite their many storage options, producers very often face post-harvest losses estimated at 14% globally [14]. To address these constraints, community storage stores are a sustainable alternative. Unfortunately, these infrastructures come up against the lack of confidence of producers in communal storage [15]. This observation raises the question of the explanatory factors for the non-appropriation of storage facilities.

The objective of this study is to contribute to the identification of factors favoring the ownership of the deliverables of agricultural development projects in Senegal.

Specifically, it will aim to:

- ~ Identify the expectations of communities that agricultural projects have been able to meet;
- ~ Characterize the autonomous agricultural development initiatives of the populations;
- ~ Analyze the approaches and practices of exogenous agricultural development initiatives;
- ~ Analyze the strategies proposed for the development of agricultural storage infrastructures.

II. MATERIALS AND METHODS

The study area covers the region of Kédougou (Senegal). Located at the eastern end of the country at 12°33'28"N and 12°10'27"W, it covers an area of 16,896 Km², or 8.6% of the national area.



Figure1: Study area

- : Department of Saraya
- : Department of Kédougou
- : Department of Salémata

We were interested in the following information:

- People's expectations

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- Autonomous development initiatives
- Exogenous development initiatives
- Strategies for developing and appropriating agricultural storage infrastructure

Information was collected from state and institutional actors

- Beneficiary populations
- Administrative and territorial authorities
- Support structures (technical services, projects, NGOs)

A review of the available documentation was carried out in order to better understand the main lines of our theme. Subsequently, the subject of the study was addressed through a mixed approach combining qualitative research (interview guide) and quantitative research (questionnaire).

A. Qualitative Study

The qualitative study was carried out through semi-structured interviews that allowed for the framing of the exchanges with the resource persons and the targeted communities. The choice of interviewees was guided by their knowledge of the study topic, their level of involvement in the implementation of development policies at the regional level and their experience with agricultural projects. Thus, we exchanged with officials and specialists (administrative services, technical services, communes, NGOs, POs) to better understand the ins and outs of the non-appropriation of project achievements.

Table 1. Interview Participants

<i>Interview type</i>	<i>Date of the interview</i>	<i>Service</i>	<i>Role</i>	<i>Locality</i>
Individual	23/11/2021	DRDR	Director	Kedougou
Individual	26/11/2021	SDDR	Technical Officer	Kedougou
Individual	27/11/2021	SODAGRI	Manager	Kedougou
Individual	30/11/2021	Department Council	SG	Kedougou
Focus Group	01/12/2021	Producers' Organisation	Members (08)	Tomboronkoto, Sékoto, Lamé, Bafoundou, Temassou
Individual	01/12/2021	ANCAR	Agricultural advisor	Kedougou
Individual	02/12/2021	NGO KEOH	President	Kedougou
Individual	03/12/2021	P2RS	Manager	Kedougou
Individual	04/12/2021	PAPIL	Assistant Manager	Kedougou
Individual	08/12/2021	PADAER-I	Manager	Kedougou
Individual	22/12/2021	Khossanto City Hall	Mayor	Khossanto
Individual	23/12/2021	Tomboronkoto City	Mayor	Tomboronkoto
Individual	23/12/2021	Animal Production	Manager	Kedougou
Individual	24/12/2021	ARD	Director	Kedougou
Individual	07/01/2022	GADEC	Manager	Kedougou
Individual	13/01/2022	CORENA	Coordinator	Tambacounda

B. Quantitative Study

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We conducted a collection followed by an analysis of quantitative data related to the users of the stores, the establishment of these stores, their management, and possible paths for improvement.

We followed the methodology of [13] consisting of first selecting the communes with the Region's technical services. Then, an exploratory study was conducted in the selected communes to target villages within which 5 producers using the stores were randomly selected. In total, 75 producers in 15 villages were approached. The surveys were conducted by a team of three operators during the month of December 2021.

C. Data collection and analysis

Due to the adoption of a mixed-methods approach, a variety of tools were used:

An interview guide for the qualitative study

A questionnaire for the quantitative study

Once the data had been collected, we proceeded to process the qualitative data by grouping the information according to the major axes. The quantitative data was processed using MS Excel and SPSS software to visualize and characterize the main trends.

III. RESULTS

A. The Integrated Application Model to the Non-appropriation

We proceeded to classify and prioritize the most important causes. For each of the main causes, root causes were identified.

i) The low level of agricultural production, which makes the use of storage of little relevance. Indeed, agricultural production is characterized by low yields associated with low acreage due to multiple underlying causes

- Poor access of producers to credit, inputs and lowland development
- Inaccessible agricultural equipment (cost, number, suppliers too far from the region)
- Important post-harvest losses linked to biotic and abiotic factors

ii) The physical and socio-economic environment marked by

- the isolation of high production areas, which makes the location of stores unsuitable because they are located in villages on major roads

- a very high level of vulnerability of households to inflation, which is accentuated in the Kédougou region due to gold mining.

Thus, many of these households cannot store food because they are food insecure.

iii) Several stakeholders complained that their involvement was more symbolic than functional. Key actors such as local authorities and technical services are only solicited for secondary activities or during ceremonial events (training certificate ceremony, etc.). For the major phases, the project calls on its own resources or contractors not bound by a mandate to perpetuate the results.

iv) The technical failures of the stores making these works unusable

v) The human factor through

- The shortcomings of producers' organizations and
- Traditional storage practices that are not in line with community stores.

These different constraints can be mitigated by the adoption of an integrated model of PASTE solutions (Partnership, Administrative, Socio-cultural, Technical and Economic).

An Integrated Model to Tackle the Non-Appropriation of Agricultural Storage Facilities by Project Target Communities in Senegal

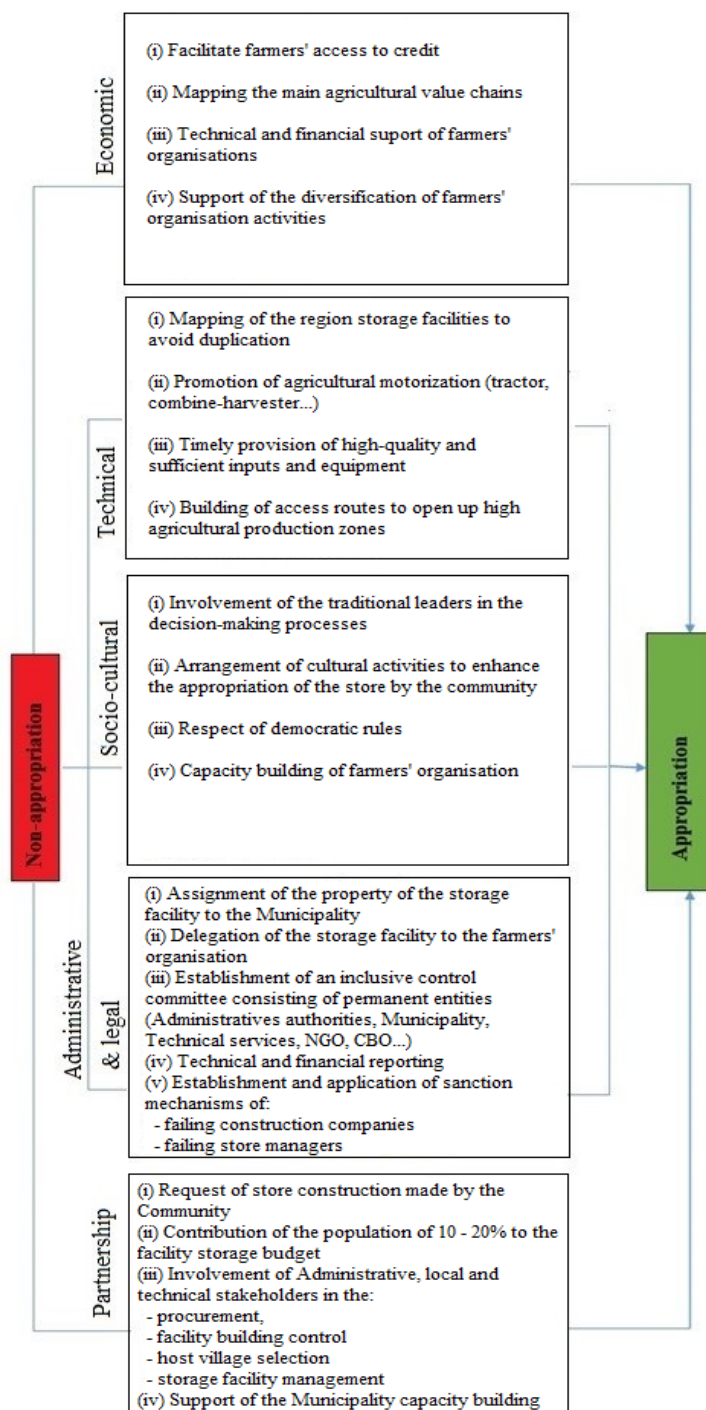


Figure2: Application model of solutions to non-appropriation

B. Surveys

1) Identification of store users: The users are mainly men with 86.7%. This trend is explained by the distribution of agricultural tasks in rural areas, which assigns certain tasks to men. Producers have a relatively low level of education, with 60% having completed primary school or having received no education. Nearly a third of producers (34.6%) have received instruction in a language other than French (13.3% in local language or Arabic) or in French at an intermediate level (21.3% in middle or secondary school). The remaining 5.3% of producers have continued their studies to higher education. The use of the store is the responsibility of married producers who make up almost 100% (98.7%) of the sample.

2) Setting up the stores: The location of the store is poorly chosen because it is too far from the polarized villages (26.7%). For the other producers, the store is either at a reasonable distance from the polarized villages (53.3%) or in the village (20%). The capacity of the store is considered sufficient by 52%, while 48% think the opposite. Less than a third of producers (20%) think

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that the stores are well built. The others are circumspect, stating that the quality is average (52%) or poor (28%). The setting up of the stores is essentially a local request (76% come from the population or the POs). The Commune can also initiate the request (9.3%). Other possibilities such as project or program interventions may also arise (14.7%).

3) Warehouse management: The management bodies of the stores are mainly chosen through participatory processes, either through elections (57.3%) or through informal consultations (33.3%). The other processes for appointing the management body are marginal with 5.3% (selection by third parties) or 4% (no management body).

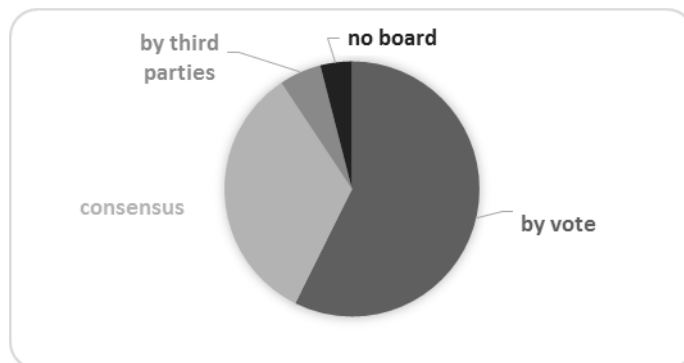


Figure3: Warehouse board selection

Meetings are not held for 41.3% of stores. A very small proportion of stores, 6.7%, hold meetings on a monthly basis. The majority of stores hold meetings every six months (32%) or every year (20%).

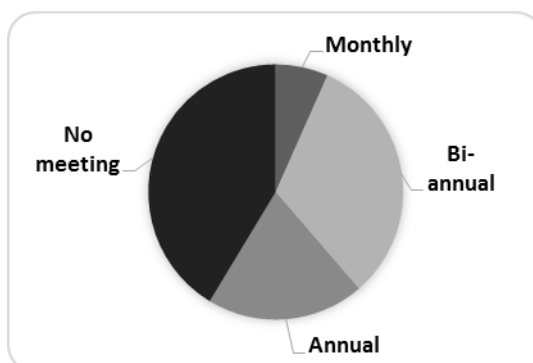


Figure 4: Meeting frequency

The absence of control by the management bodies is the most common trend with 50.7%. When control is exercised, the structure responsible may be the producers' organization (22.7%), a multi-stakeholder committee (17.3%), the host commune (6.7%) or the project that initiated the establishment of the store (2.7%).

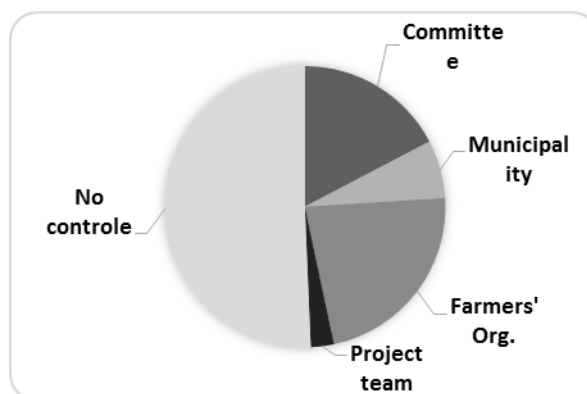


Figure5: Board control

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Warehouses are mainly used for agricultural inputs subsidized by the state (48%).

Storage of harvested cereals is also common, at 22.7%. Crops intended for marketing pass through the stores in the case of groundnuts (5.3%) and other crops (9.3%). Agricultural materials and the lack of use of the store together account for 6.7% and 4% respectively.

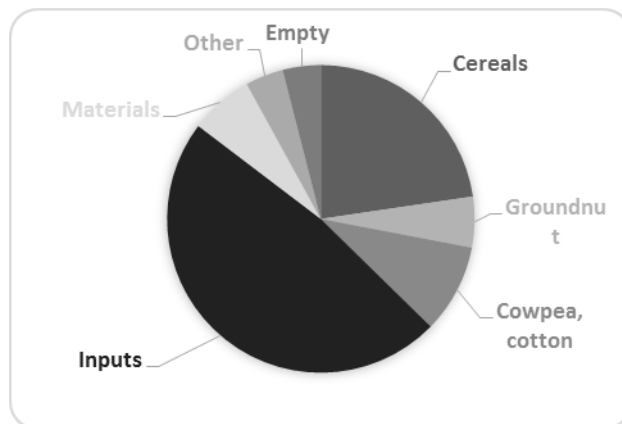


Figure6: Main storage items

The stores seem to be under occupied. Only 40% of producers believe they are completely full. According to the majority of producers, the stores are only one third (16%) or half full (44%).

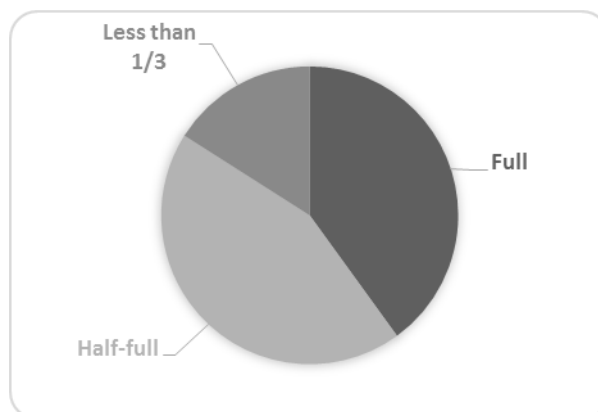


Figure7: Warehouse occupation

The low level of occupancy noted above is accompanied by a short duration of occupancy which is less than three months and between 3 and 6 months according to 30.7% and 50.7% of the producers respectively. Only 18.7% of the producers estimate that this duration exceeds 6 months.

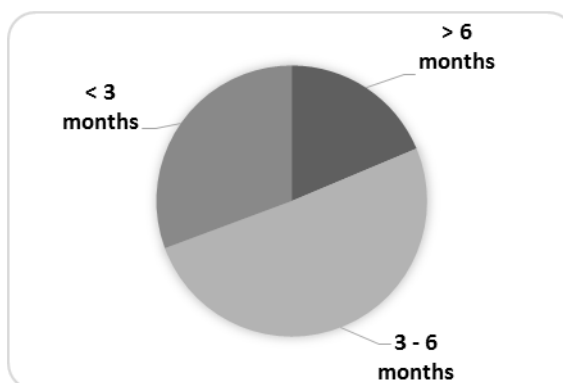


Figure 8: Duration of the warehouse occupation

The stores fulfill a community role of storing inputs for communities or producer organizations. As such, they rarely contribute to income generation (84%). However, 16% of producers say that this can happen when they rent the stores.

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4) Ways to improve the ownership of the stores by the population: According to 57.3% of producers, the lack of harvesting and post-harvest equipment is the main constraint that hinders agricultural activity. The second major constraint is access to inputs and agricultural credit according to 26.7% of producers. The other expectations are, in order of priority, bio-aggressors (6.7%), the unavailability of labor (5.3%) and storage facilities (4%)

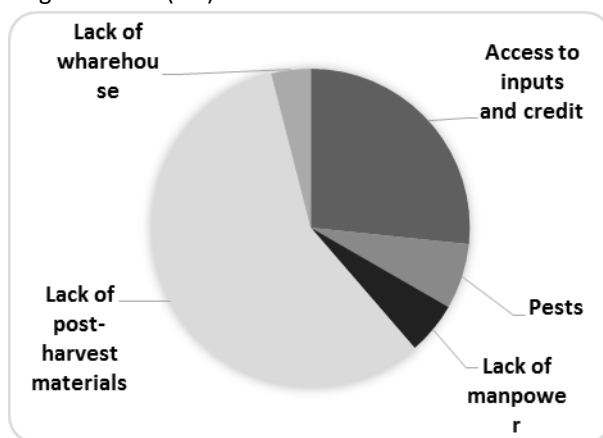


Figure 9: Main agricultural constraints

Nearly one-third of producers (34.7%) believe that stores are important for procurement. Other producers consider that the most important role of the stores is to secure seeds (29.3%) and marketable goods (12%). Thus, it appears that 76% of the producers consider the stores to be a crucial part of the agricultural activity. The remaining producers use the stores for non-agricultural activities such as storing subsidized food (18.7%), renting them out to generate income (2.6%) or for other purposes (meetings, etc.).

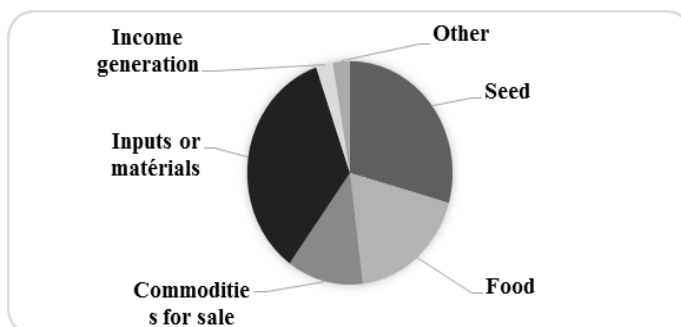


Figure 10: Most important warehouse functions for farmers

The two main reasons for not using the stores are the low level of agricultural production (36%) and cultural habits of individualized crop storage (28%). The poor management of these facilities by the store management committees is relatively important (13.3%). The other reasons for non-use are the non-involvement of the population in the process of setting up the stores (4%), the poor quality of the stores (4%), the poor selection of beneficiaries (1.3%) or other factors more related to the producers or the communities (10.7%).

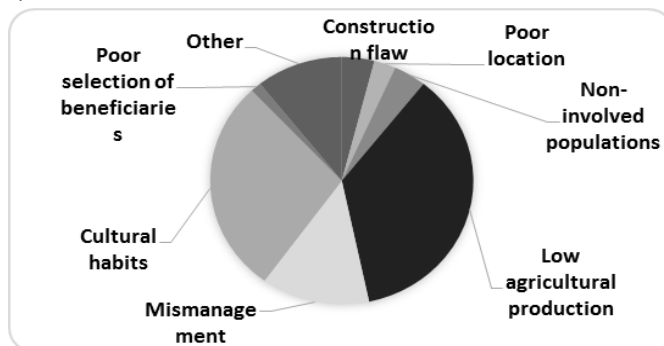


Figure 11: The causes of the warehouse non-utilisation

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IV. DISCUSSION

1) Model: Several social models have been applied to agriculture, particularly in the sustainable development of entrepreneurship [16], integrated agricultural risk evaluation [17] or agricultural education [18]. However, there is a need to develop more tools to enhance the appropriation of agricultural project achievements.

2) User profile: The management of inputs and crops seems to have a cultural connotation that places women and those who are not yet married in second place. Women face more constraints in their agricultural activities than men whether it is access to land, access to irrigation water, access to credit and access to agricultural inputs [19]. Thus, women's involvement in the management of community stores is very low, hence the emergence of innovations such as the Greniers Féminins de Soudure (GFS), which are grain stocks exclusively constituted, managed and intended for women [20].

One of the main manifestations of the low level of education of producers, particularly women, is felt through the low level of agricultural productivity [21].

3) Setting up the store: Most producers (73.3%) liked the location of the stores. This positive trend contrasts with the pronounced skepticism of producers regarding the capacity and quality of the facilities, which they consider to be average to poor at 48% (capacity) and 80% (quality) respectively. This opposition between an endogenous need expressed by the populations and an external intervention poorly adapted to local expectations places the cursor of non-appropriation on the inadequacy of the projects' achievements with local realities. Other studies have shown that it is essential to analyze the needs of producers based on their own logic and criteria [22] in order to expect them to appropriate the proposed technologies.

4) Store management: The under-occupation of warehouses by PO members is easily understood by their lack of involvement in the running and management of the warehouses by the leaders (rare meetings, lack of control by management committees, etc.). The warehouses are used, in priority, for the storage of inputs (48%) and cereals (22.7%). This trend was also noted by [23], who reports the use of village stores for the storage of paddy rice and husked rice.

Overall, the stores do not generate income (84%). This may be due to the way the store is acquired, which does not include a financial contribution from the PO. [23] reports the experience of the Foabougou village association, which managed to generate revenue from two of its stores that it built with its own funds. It should be noted that these stores were equipped with post-harvest equipment (scales, threshing machine, huller) that allowed them to meet the additional demands of producers for storage and post-harvest operations.

5) Pathways to improvement: Since the main constraints in agriculture (84%) are the lack of agricultural equipment and difficulties in accessing credit and inputs, any given store implementation must integrate mechanization and improved access to credit and inputs. In addition, the store must be placed throughout the agricultural activity and respond to the interconnected expectations of producers. The mono-functionality of the stores is a major shortcoming that can considerably affect their level of use. Low agricultural production and cultural habits are two apparently independent but in reality linked factors. In fact, traditional agriculture was mainly intended to satisfy family needs. In addition, the entire production process was thought out and implemented within the concession, and crops were stored exclusively in family granaries. However, increasing production levels through the use of modern equipment, inputs and other technologies can provide sufficient crops for consumption, sale and storage. In other words, raising production levels will create a need for storage that will overcome any cultural reluctance.

V. CONCLUSIONS

The State of Senegal and its development partners are working to improve the well-being of the population and their economic development through significant sectoral investments, particularly in agriculture. It is thus common to see agricultural projects intervene in the various agro-ecological zones to strengthen human capital or structurally transform the determinants of the economy of the intervention zones. With this in mind, several storage warehouses have been built at the request of the communities. Paradoxically, these warehouses are little used by the beneficiary communities if they are not simply abandoned. The qualitative and quantitative study of this phenomenon of non-appropriation has made it possible to identify original (project development), operational (non-involvement of key actors) and contextual (low level of performance of the agricultural sector) causes. The systemic analysis of the explanatory factors of the phenomenon has led to the development of an integrated model that would allow for a better appropriation of project achievements by the beneficiary communities. Nevertheless, our study does not pretend to solve the major problem of non-appropriation, given its scope, complexity and tenacity. However, the reasoned and adapted implementation of the transformation framework of the proposed PASTE solutions could play an important role in its mitigation or even its progressive dissipation.

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Effect of Corporate Governance on Financial Distress: Evidence from Listed Firms at Ghana Stock Exchange



Alex Abugri

ABSTRACT: This study was conducted to determine the effect of corporate governance on financial distress of listed firms at Ghana Stock Exchange (GSE) using panel data from 2015 to 2019. Specifically, the study focusses on: The effect of board size on financial distress of listed firms at GSE, the effect of board gender diversity on financial distress of listed firms at GSE, the effect of ownership concentration on financial distress of listed firms at GSE and the effect of number of non-executives on financial distress of listed firms at GSE. OLS Regression Model has been conducted using EVIEWS 11. The data has been validated using normality, multicollinearity and Heteroscedascity test as recommended by previous research due to their robustness. The study found that 15.5% variability in financial distress of listed companies is explained by corporate governance practices of the listed companies. This result suggests that a unit change in corporate governance practices will bring about 12.5% changes in financial distress management. The study found that board size was significant determinant of financial distress. Again, the study further found that board diversity was significant determinant of financial distress. Moreover, the study found that managerial experience of the board was significant determinant of financial distress. However, non-executive and capital structure was not determinants of financial distress. The study concludes that corporate governance exerted significant influence on financial distress of listed firms at Ghana Stock Exchange. The study recommends that selected firms at GSE must develop and formulate good policies to help regulate and manage board members so that the decision-making process of the firm can be facilitated to achieve firm goals and objectives while maintaining financial stability.

KEYWORDS: Corporate Governance, Financial Distress, OLS Model, Ghana Stock Exchange

1. INTRODUCTION

Corporate governance denotes maximum honesty and intensity in production of an organization. Different contributors in the organizations such as; managers, stakeholders, board as well as directors are assigned with privileges and duties by corporate governance and give clarification on governance that runs affairs of businesses. Management decisions automatically affect the firms' direction (Datta, 2018; Kamau, 2018). Decisions are therefore established on shareholding composition, financial prospects due to firms capabilities, corporate governance and arising economic factors on the market (Lamichhane, 2018).

Financial distress is widely considered as various instances where firms encounter financial challenges. Bankruptcy, insolvency and failure are some basic factors that are used to describe financial distress (Maina and Sakwa, 2012). In unexpected cases, situations that strongly hit an organization is referred to as financial distress. Senbet and Wang (2012) also interpreted financial distress as occasion where contracts and creditors extremely go bankrupt. Managers' decisions have significant relationship with finances in the firm therefore inappropriate financial decisions strongly affects firms' operations (Sanda et al. 2005). Financial distress worsens when firm fails to gather enough resources to cater for dues on time. Firms' finances may face total bankruptcy or liquidation with regards to less assistance in bit to settle their dues (Hu, 2011).

Problem Statement

The banking sectors take is the central focus of regional, local and worldwide banks. Several external and internal forces contribute to the establishment of the banks. Bank growth in Kenya's local banks is rapid. Rapid improvement in local banking sector serve as a major benefit to enhance the objectives of liberalization in finances, economy, competition among banks market, improve service to customers and enlarge credit asses in small-medium businesses in the locality. In real cases, Ghana as a nation does not have most of its firms on the stock list. Never-ending operation in firms' sometimes lead to failure and circumstances that were not predicted but this may not always be the reason for business failure (Senbet and Wang, 2012). Talian (2012) revealed that, foreseeing financial distress in Ghana was consistent with financial variables. Financial variables such as poor capital decisions,

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poor internal management shortage of skilled labor and lack of access of credit attribute to distress in finances. Mandi (2014) concluded that, financial factors that lead to huge firms' future direction such as Ghanaian sovereign risk was detected by Z score.

Wamugo, Makau and Kosimbei (2014) emphasized that, not all firms in Ghana are regarded as statutory management. Business after ensuring effective productivity by producing quality materials and unbeatable strategies still encounter financial distress, this is an indication that, success in businesses is achieved when there is efficient operation in the business by financial operators and managers in the firm. Globally, both developed and developing countries encounter financial distress. The research studied corporate governance, create awareness of financial distress in some firms in Ghana and recommend measures to get rid completely or reduce it and create policies to mitigate the challenges of moral hazard and therefore reduce the occurrences of financial distress. Moral hazard, lending large amount of money to customers without considering risk involved has led to financial distress in local banks hence local banks for the past years have been encountering financial difficulties, which has pose major threat on their effort to achieve higher benefits. The main objective of the study is to determine the effect of corporate governance on financial distress of listed firms at Ghana Stock Exchange (GSE). Specifically, the study will be guided by the following objectives: To determine the effect of board size on financial distress of listed firms at GSE; examine the effect of board gender diversity on financial distress of listed firms at GSE; determine the effect of number of non-executives on financial distress of listed firms at GSE, and assess the effect of ownership concentration on financial distress of listed firms at GSE.

2. LITERATURE REVIEW

Corporate Governance

Knell (2006) defined corporate governance as the process whereby corporate entities operate based on occupational laws and standards. Corporate governance as denote is the process whereby managers ensures that all occupational activities are regulated and governed by administrative measures and controlling mechanisms so that intended goals and objectives can be achieved. Ashbaugh et al (2004) revealed that, corporate governance is an instrument that can be used to avert business risks and irregularities in corporate entities.

Corporate governance was defined by the Cadbury Committee of U.K in 2002 as a system of operation whereby business activities are regulated and governed to ensure consistency and accountability. Corporate governance helps firms to achieve organizational goals and objectives especially in fulfilling the interest of shareholders. Corporate governance involves all activities that are in accordance with rules and regulations hence with managements' consent. Corporate governance ensures accountability, transparency and maintaining ethical standards. However, effective corporate governance must consist of shareholders, board of directors and management.

Corporate governance is the act of controlling, managing and regulating organizational activities to achieve desirable outcomes. According to Adams and Mehran (2008) corporate governance is the process of creating good atmosphere for good working conditions to improve performance and growth. Corporate governance is also the act of creating balance in the interest of shareholders, management, customers, supplier government and other stakeholders. Corporate governance reduces capital expenditure and helps organizations to achieve higher performance and growth.

To achieve successful corporate governance practices, firms need to deploy systems and measures that can help in the adoption of corporate governance practices, for instance examining the relevant structures that may identify the appropriate practices to sustain corporate governance practices (Aguilera & Jackson, 2003; Dewji & Miller, 2013; CMA, 2015).

Current study measured corporate governance using non-executive directors, board size, board gender diversity and ownership concentration.

Financial Distress

According to Emery, Finnerty and Stowe (2007), financial distress is a situation whereby financial goals and objectives are not met due to certain mismanagements or other related factors. Financial distress is firms' inability to engage into business competition as a result of financial drain, high deficits and other unfavourable conditions. Labie and Périlleux (2008) explained that financial distress is firms' inability to finance business activities and also unable to settle deficits. Financial distress is a stage in the business cycle whereby firms become financially incapable and unable to fulfill financial obligations. Outecheva (2007) indicated that financial distress may include decrease in profitability rate, poor cash flows, decrease in sales and other related indicators. Outecheva (2007) further showed that firms can become financially constrained even without a default portfolio, this maybe as a result of internal mismanagement and irregularities among top management. Aasen (2011) opined that there are two forms of financial distress cost and these include, direct insolvency cost and indirect insolvency cost. The direct cost deals with costs involving legal or lawful costs whereas the indirect insolvency cost deals with financial difficulties in business management.

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Financial distress disrupts firms from growing especially when firm go bankruptcy. During this stage, cash flow is reduced, profit margin decreases as well as decrease in liquidity levels (Crutzen & Van Caillie, 2007).

Financial distress is a situation in which a company's financial situation deteriorates to the point of bankruptcy. According to Altman and Hotchkiss (2006), corporate financial distress can be related to three common concepts used in business research: failure, bankruptcy, and insolvency. Failure occurs when the rate of return is not commensurate with the amount of capital invested, or when revenues are insufficient to cover costs because the average rate of return is systematically lower than the cost of capital. Financial distress occurs prior to a firm's bankruptcy proceedings.

Theoretical Review

The agency theory emphasizes that, company owners delegate their responsibilities to management so that the management would take control and manage the affairs of the industry on behalf of the business owners (Jensen & Meckling, 1976). In this appeal, conflict may arise between managers and business owners since there may be conflicting interests between the management and shareholders. This however creates something called agency problems whereby initiative is taken by the business owner by establishing the board committee to act as the referee for both parties (Rodriguez-Fernandez et al., 2014).

Agency problem is created mainly as a result of separation of ownership and control. In that case, the agency theory had been developed with intent of helping resolve agency problems. The agency theory indicates that independent directors and credible external auditors is one of the essential mechanisms for monitoring the operations of management and also curbing agency conflicts. Monitoring systems put management on their toes to work as expected by business owners (Shin-Ping & Tsung-Hsien, 2009). Management is always expected to ensure that all organizational activities are geared towards achievement of goals and objectives (Zouari & Taktak, 2014). Nonetheless to maintain consistency and focus, there is the need for effective monitoring systems and practices so that management can be monitored to make sure that they stick with the intention of the organization.

Empirical Review

Bredart (2014) in the US context assessed the impact of board performance on financial distress. Bredart had already established that bankruptcy by firms had been increasing significantly ever since 2007. A study was therefore conducted to determine the cause of financial distress in most organizations. The study discovered that board size was a major factor affecting bankruptcy or financial distress in most organizations. This shows that, firms that have large board size are less likely to go bankruptcy than firms with small board size in the US.

Md-Rus, Mohd, Latif and Alassan (2013) study discovered that, ownership structure was a significant determinant on firm performance. However, study established that government ownership had no significant effect on financial performance of firms. Besides, government ownership was not a factor influencing the financial distress of organizations. In an attempt to determine the impact of ownership structure financial distress, logistic regression model was used. Result showed that, government ownership had no significant influence on firms' financial distress.

Hu and Zheng (2015) also deemed to explore whether ownership structure had any impact on financial distress of firms in China. The study found that, ownership structure was a factor that enables firms to reduce financial distress. Owners of organizations must therefore ensure that appropriate structures are developed to help maintain consistency and transparency in all organizational activities to enhance the financial performance of the organization. This result was achieved using a sample of 378 firms listed in China. These firms were firms that had gone through financial distress between 2000 and 2008.

Akhmetova and Batomunkueva (2014) examined the impact of board composition on financial distress in Sweden and Denmark. Study showed that internal governance system is a major factor that influences firm performance. The study used the Binary and multiple regression analyses to analyze the data for the financial prediction. Study further indicated that board independency had a significant relation with financial distress.

3. RESEARCH METHODOLOGY

Research Design

In determining the effect of corporate governance on financial distress of listed firms at Ghana Stock Exchange (GSE), the researcher employed both explanatory and descriptive research designs. Research designs were purposely employed to create awareness on financial distress situation. Questions of the form "what" were answered correctly by the help of descriptive and explanatory research designs. All questions that may rise in the process of the study can be answered by the research designs and hence processes involved for making research on the effect of corporate governance on financial distress of listed firms at Ghana Stock Exchange (GSE) (Gill & Johnson, 2010) must be ushered by research designs.

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Population and Sample

Based on rich history and consistency, 15 out of 42 firms were selected from firms at Ghana Stock Exchange at the later part of December 2019. In all the population comprised 42 listed companies on the Ghana stock exchange.

Data Collection and Sources

Yearly financial data of the selected 15 firms in Ghana Stock exchange were used to gather data for the study. GSE annual data that had been kept by the firm from 2015 to 2019 were gathered for the study and GSE handbook which have annually published data also provided data for the study. These comprised the total number of non-executive directors, board size (number of board members), board gender diversity (number of female board members) and ownership concentration (percentage number of shares owned by the management).

Model Specification

The model used for the study was ordinary least square (OLS) regression. The model was employed to show significant relationship among corporate governance practices and financial distress, which forms the study's variables. A multivariate regression analysis was also employed to establish a relationship between more than one variable in the study. The model is shown below:

$$Y = \beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + \beta_5X_5 + \beta_6X_6 + \epsilon$$

Where Y – dependent variable (Financial distress)

X1 – Number of Non-executive directors

X2 – Board Size

X3 – Board Gender Diversity

X4– Ownership Concentration

ϵ – Is the error term

β – Predictor variables coefficients

Table 1 Measurement of Variables

Variables	Types	Data Source	Measurement
Financial Distress	Dependent	Secondary Data	Altman's Z score
Number of nonexecutive directors	Independent	Secondary Data	Number of nonexecutive directors
Board Gender diversity	Independent	Secondary Data	Number of Female board members
Ownership concentration	Independent	Secondary Data	Percentage number of shares owned by the management
Board size	Independent	Secondary Data	Total Number of Board

Source: Author's compilations

Data Analysis Method

Normality test, heteroscedasticity and multicollinearity analysis of the data must connect with the research objective\purpose (Kothari, 2004) when presenting the data. EVIEWS 10 was utilized in giving an appropriate analysis to the data. The findings of the study were presented in mean, standard deviation, minimum and maximum values that show the variables utilized in the study. The researcher used descriptive analysis to derive the major findings through tables and percentages for conducting the analyses. Validity and accuracy of models were ensured through the use of diagnostic strategies viz. normality, heteroscedasticity, autocorrelation and multicollinearity test. Degree of multicollinearity among variables is determined by employing correlation matrixes and variance inflation factors. Regression analysis helped present data in a suitable test statistics and tabular form. The study employed Altman Z score model as a research tool for calculating financial distress as indicated below. Bwisa (2010) used Altman's model applicability in predicting financial distress and discovered the model's applicability to be 80% therefore in using the model to calculate financial distress among listed firms at GSE, the study is justified. Moreover, Mamo (2011) also utilized the model to estimate financial distress in commercial banks and discovered the validity of the model was 80%.

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4. DATA ANALYSES AND DISCUSSION

Descriptive Statistics of Variables used in the Model

The variables in the model are described using means, standard deviations, skewness and kurtosis

Table 2: Descriptive Statistics

	Financial distress	Board size	Capital structure	Diversity	Ownership concentration	Non-executive
Mean	4.47	8.57	2.28	1.11	0.40	1.00
Median	4.94	7.00	0.44	1.00	0.55	0.00
Maximum	7.88	11.00	13.30	4.00	0.72	4.00
Minimum	0.87	5.00	-0.25	0.00	0.02	0.00
Std. Dev	2.18	3.1	3.06	1.23	0.26	1.30
Skewness	-0.42	0.42	1.76	0.49	-0.48	0.77
Kurtosis	1.82	2.87	6.23	2.32	1.34	2.12
Observation	125	125	125	125	125	125

Source: Author's compilations

As illustrated in the Table 2, the study revealed that financial distress recorded a mean score of 4.47 and a standard deviation of 2.18. Skewness under financial distress was recorded -0.42 and kurtosis 1.82. Also, board size recorded 8.57 and 3.1 scores for mean and standard deviation each. A skewness of 0.42 and kurtosis of 2.82 were recorded for board size. Moving on with capital structure a mean score of 2.28 and standard deviation of 3.06 were recorded. Capital structure recorded skewness of 1.76 and kurtosis of 6.23.

Again, the study found that, diversity recorded a mean score of 1.11, standard deviation score of 1.23, skewness of 0.49 and kurtosis of 2.32. Moreover, Ownership concentration recorded a mean of 0.40, standard deviation of 0.26 and skewness of -0.48. Kurtosis recorded 1.34 for management. Lastly, a mean score of 1.00 was recorded for non-executive. A standard deviation of 1.30, skewness of 0.77 and kurtosis of 2.12 were recorded under non-executive.

Diagnostic Tests of Normality, Heteroscedasticity and Multicollinearity

The data have been validated using normality, multicollinearity and Heteroscedascity test as recommended by previous research due to their robustness. These have been detailed in the next section

Test of Multicollinearity

As showed in the table 3 using Breusch-Godfrey Serial Correlation LM Test the study found no multicollinearity problems in the model. All the null hypotheses for multicollinearity were rejected supporting the alternative hypothesis that the model does not contain multicollinearity

Table 3: Breusch-Godfrey Serial Correlation LM Test

F-statistic	41.15488	Prob. F(2,117)	0.300
Obs*R-squared	51.62176	Prob. Chi-Square(2)	0.1560

Source: Author's Estimation

Test of Heteroscedasticity

As presented in the table 4 using Breusch-Godfrey Heteroscedasticity LM Test the study found no Heteroscedasticity problems in the model. All the null hypotheses for Heteroscedasticity were rejected supporting the alternative hypothesis that the model does not contain Heteroscedasticity

Table 4: Heteroscedasticity

F-statistic	2.541206	Prob. F(5, 119)	0.0319
Obs*R-squared	12.05908	Prob. Chi-Square(5)	0.0340
Scaled explained SS	5.772119	Prob. Chi-Square(5)	0.3290

Source: Author's Estimation

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Test of Normality

As indicated in the Figure 1 using Jarque Bera test statistics the study found the distribution of the data in the model as normally distributed. All the null hypotheses for Jarque Bera test statistics were rejected supporting the alternative hypothesis that the distribution of the model is normally. Moreover, skewness is 0 and kurtosis is less than 3.

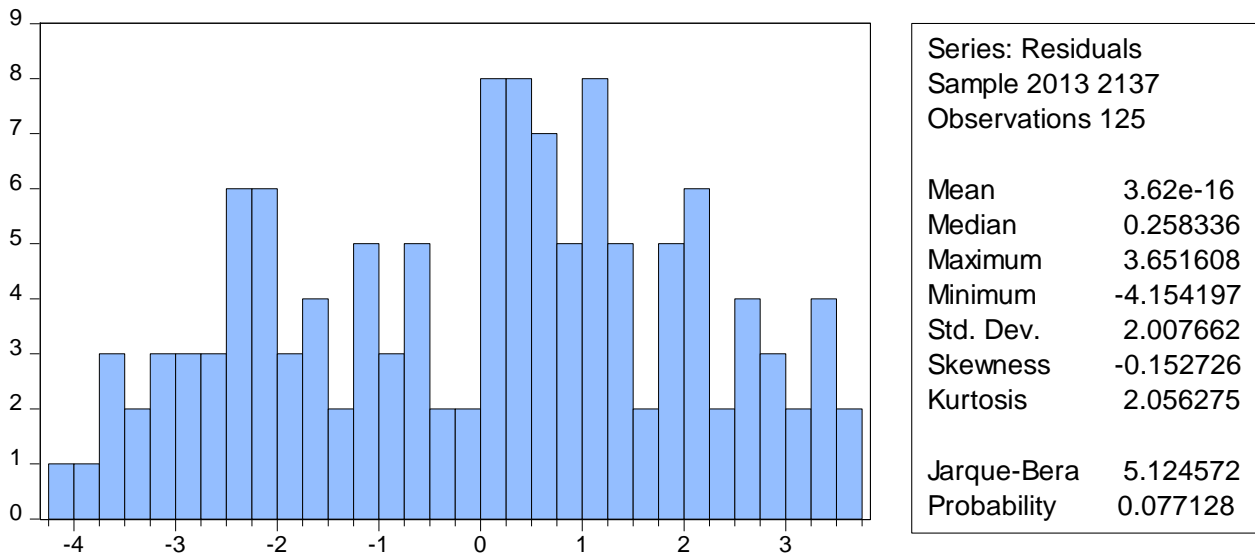


Table 5: Correlation Matrix

	Profit	Capital structure	Management	Non-executive	Board size	Diversity	Financial distress
Profit	1						
Capital structure	.321** (0.000)	1					
Management	-.144 (0.110)	-.383** (0.000)	1				
Non-executive	.076 (0.401)	.331** (0.000)	-.471** (0.000)	1			
Board	.408** (0.000)	.283** (0.001)	-.466** (0.000)	.221* (0.013)	1		
Diversity	.433** (0.000)	.306** (0.001)	-.311** (0.000)	.171 (0.057)	.413** (0.000)	1	
Financial distress	.288** (0.001)	-.107 (0.234)	.227* (0.011)	-.238** (0.007)	.016 (0.858)	.074 (0.409)	1

** . Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Table 5 presents inter-construct correlation between the variables used in the model. The study found a significant ($r=0.288$, p -value < 0.05) correlation between profit and financial distress. Meanwhile, capital structure had no significant correlation between financial distress ($r=-0.107$, p -value > 0.05). Moreover, the study reported a significant correlation between Ownership concentration and financial distress ($r=0.227$, p -value < 0.05). Again, the study reported a negative correlation ($r=-0.238$, p -value < 0.05) between non-executive and financial distress. However, board size ($r=0.016$, p -value > 0.05) and diversity ($r=0.074$, p -value > 0.05) had no significant correlation between financial distress.

Table 6: Effect of Corporate Governance on Financial Distress

Variables	Coefficient	Std. Error	T-statistic	P-value
Board size	0.16	0.09	1.66	0.008
Capital structure	-0.00	0.06	-0.05	0.956
Diversity	0.34	0.18	1.86	0.054

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Ownership concentration	-3.22	0.96	-3.34	0.001
Non-executive	-0.18	0.16	-1.12	0.264
Constant	4.44	0.59	7.49	0.000
<hr/>				
R-squared		0.155		
Adjusted R-squared		0.125		
S.E. of regression		2.04		
Sum squared resid		499		
Log likelihood		-263		
F-statistic		4.37		
Prob(F-statistic)		0.001		

Source: Author's Estimation

As indicated in the Table 6 R–square result suggested that 15.5% variability in financial distress of listed companies is explained by corporate governance practices of the listed companies. This result suggests that a unit change in corporate governance practices will bring about 12.5% changes in financial distress management. The study found that board size was significant determinant ($\beta = 0.16$, $p\text{-value} < 0.05$) of financial distress. Again, the study further found that board diversity ($\beta = 0.34$, $p\text{-value} < 0.05$) was significant determinant of financial distress. Moreover, the study found that Ownership concentration ($\beta = 3.22$, $p\text{-value} < 0.05$) of the board was significant determinant of financial distress. However, non-executive and the capital structure were not determinants of financial distress.

5. DISCUSSION OF RESULTS

The study found that board size was significant determinant ($\beta = 0.16$, $p\text{-value} < 0.05$) of financial distress. Again, the study further found that board diversity ($\beta = 0.34$, $p\text{-value} < 0.05$) was significant determinant of financial distress. Moreover, the study found that Ownership concentration ($\beta = 3.22$, $p\text{-value} < 0.05$) of the board was significant determinant of financial distress. However, non-executive and the capital structure were not determinants of financial distress. Previous studies such as Shah (2016) found that, corporate governance practices had an insignificant relation with financial distress. The study was taken in the Pakistan's economy with the intent of fulfilling a contextual knowledge gap. Moreover, Manzaneque, Priego and Merino (2016) found that, corporate governance practices have a significant impact on firms that are financially distressed. Most at times, firms become financially burdened due to resource mismanagement and lack of effective corporate governance. But study established that, through corporate governance, firms can prevent financial distress to become effective in business operation. Besides, corporate governance would help enhance the capital structure of firms as well as increasing the net profit margin. Campbell, John, Hilscher and Jan (2011) discovered that, distressed shares tend to be lower in terms of performance and that these shares had greater market instability and face diverse risks. Besides, investors that are under distressed are unable to achieve rewards since the overall output of the organization is negatively impacted. Manzaneque, Priego and Merino (2016) who assessed corporate governance and monetary distress revealed that corporate governance practices have a significant impact on firms that are financially distressed. Most at times, firms become financially burdened due to resource mismanagement and lack of effective corporate governance. But study established that, through corporate governance firms can prevent financial distress to become effective in business operation. Besides, corporate governance would help enhance the capital structure of firms as well as increasing the net profit margin.

6. CONCLUSIONS AND IMPLICATIONS

This study was conducted to determine the effect of corporate governance on financial distress of listed firms at Ghana Stock Exchange (GSE) using panel data from 2013 to 2017. Specifically, the study focus on: The effect of board size on financial distress of listed firms at GSE, the effect of board gender diversity on financial distress of listed firms at GSE, the effect of ownership concentration on financial distress of listed firms at GSE and the effect of number of non-executives on financial distress of listed firms at GSE. The study broadly concludes that 15.5% variability in financial distress of listed companies is explained by corporate governance practices of the listed companies. This result suggests that a unit change in corporate governance practices will bring about 12.5% changes in financial distress management. The study found that board size was significant determinant of financial distress. Again, the study further found that board diversity was significant determinant of financial distress. Moreover, the study found that managerial experience of the board was significant determinant of financial distress. However, non-executive and capital structure was not determinants of financial distress.

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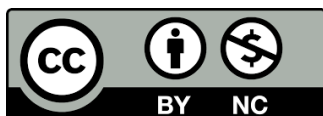
The study found that that 15.5% variability in financial distress of listed companies is explained by corporate governance practices of the listed companies. Therefore, the following recommendations are made. First and foremost, the study suggests that selected firms at GSE must develop and formulate good policies to help regulate and manage board members so that the decision-making process of the firm can be facilitated to achieve firm goals and objectives while maintaining financial stability in their institutions. Also, the study recommends that selected firms at GSE must increase the number of non-executive board so that corporate governance practices can be enhanced to promote accountability and transparency in all internal activities thus reducing the financial distress position. Again an increase in management and control in an organization promotes the operational performance particularly in the financial performance of the firm. The study therefore recommends that management increase management practices to help decrease challenges affecting the growth and development of the firm. In this case, study suggests that selected firms should adopt effective strategies and measures to help ensure that activities are enhanced to promote effectiveness thus avoiding inter-conflicts between business owners and managers.

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Value Erosion and the Need for Spiritual Basis of Education

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ABSTRACT: Education is considered as the foundation upon which the entire edifice of the moral culture of an individual is to be constructed. Education should aim at producing this complete man or whole man with a harmonious all round development of personality i. e. physical, mental, social, moral and spiritual. Education in ancient India aimed at producing this whole man. At a later period, the Buddhist and Jain philosophy of education also insisted on morality, non-violence, self-control, austerity, sacrifice and service to the humanity. In spite of merciless and extensive destruction during the medieval age, Hindu educational institutions remained a living reality. At a much later period there developed the '*Namaghar*' in Assam and '*Bhagvat Tungi*' in Odisha which became the centers of mass education in their respective states. However, the system of education introduced by Macaulay in 1835 aimed at producing a volume of loyal white collar Indian employees for British administration. This led to the complete devastation of Indian values in the education system of India. This paper discusses about the degradation of values in the education system of India and suggests measures to work for the implementation of value education in the schools of India.

KEYWORDS: Value degradation, Education system, English education, Western culture

VALUE EROSION AND THE NEED FOR SPIRITUAL BASIS OF EDUCATION

The Bible says: God has created man in his own image. Man is considered to be the noblest creation of god. Man has rationality through which he can distinguish between right and wrong or good and bad and can judge his own course of action. The presence of certain characteristics in man has made him distinct from other species on earth. Such characteristics or attributes in man can be referred to as values with which he becomes valuable for himself as well as for the society and without which he becomes valueless.

Swami Samarth Ramdas has classified values into four categories. They are (1) personal values such as selflessness, industriousness, simplicity, self-evaluation, purity, leadership, self-control, judiciousness, faith in science and rationality, (2) Social values like friendship, equality, brotherhood, sacrifice, secularism, tolerance and good manners, (3) Moral values that include responsibility, truthfulness, sympathy and love for nature, and (4) Spiritual values consisting of faith in God, indifference, love and aesthetic attitude (Sarangi, 2003). A man imbued with all these values is regarded as a complete man. Education should aim at producing this complete man or whole man with a harmonious all round development of personality-social, moral and spiritual.

Education in ancient India aimed at producing this whole man. The ultimate aim of life was regarded as the ultimate aim of education. '*Moksa*' or attainment of salvation was the aim of life and so also the aim of education. The pupil was called '*Brahmachari*' (the seeker of Brahman, the Absolute Reality) and his tenure of study was taken as a journey on the path of the attainment of the '*Brahman*'. The whole universe emanates from that Absolute Reality. Therefore, all the organisms in the world, in one way or other, are related to each other. The aim education as well as the aim of life in ancient India was to realize that relation by making union with the Absolute.

Education during ancient India was characterized by the *gurukul* system. Pupils had to live together in the *gurukul* irrespective of their caste, creed or social status and were taught to be abided by the idea of '*vasudhaiva kutumbakam*' or universal brotherhood. Living together irrespective of socio-economic status leads to the inculcation of social and moral values such as love, friendship, tolerance, sympathy, equality and good manners. Along with the reading and memorization of the Vedic scriptures, pupils had to perform certain other activities such as collecting fire wood for oblation, grazing the cattle, doing agriculture etc. This helped in the integral development of human personality through life related experiences on the part of the pupil and evaluation of pupils in a continuous and comprehensive manner on the part of the teacher.

The life of a *brahmachari* in the *gurukul* was marked by purity and simplicity. A *brahmachari* or pupil had to observe purity in thought, word and deed. He had to lead a simple life by abstaining himself from all sorts of worldly pleasures through strict self-

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control. The *brahmachari* was taken as a seeker of the *Brahman*, the Truth. The life of the student itself helped in the development of personal and moral values such as purity, simplicity, self-control, truthfulness, selflessness etc. The Vedic scriptures are endowed with hymns in praise of nature such as *Usha* (the goddess of Dawn), *Surya* (the Sun-God), *Chandrama* (the Moon) etc, which helped in developing an aesthetic sense in the pupil along with the inculcation of spiritual values such as faith in God and love for nature.

The Vedic *Guru* or teacher was full of with love to his pupils. He was like a father to his students. Emphasis was given on maintaining a personal relation between the teachers and taught. Education was residential and absolutely free and the teacher had to fulfill the basic needs of his students including food and shelter. Education was considered as the foundation upon which the entire edifice of the moral culture of an individual had to be constructed. Therefore, the moral culture of the pupil was not separated from his intellectual culture (Prabhu, 1991). It was the duty of the teacher to teach morality or value along with knowledge. He had to attain self-realization, wisdom, values and virtues so much so that he could act as a model or an ideal before his students. His way of life was a constant source of inspiration for the pupils. Discipline was the result of this constant inspiration and influence.

On the whole education in ancient India was totally value based aiming at the development of the whole man-body, mind and spirit. Various aspects of education such as aims of education, teacher, learner, discipline and school were centred around universal values like truth, purity, love sacrifice, tolerance universal brotherhood. The Buddhist and Jain philosophy of education also insisted on morality, non-violence, self-control, austerity, sacrifice and service to the humanity (Buddhaghosa, 2010).

Buddhist education aims at a personality transformation into a highest form of humanity through ethical, intellectual and spiritual perfection. These three faculties of perfection of human life undoubtedly lead a man through mundane happiness to supra mundane happiness, which is the highest achievement we all are equally looking for. The chief aim of Buddhist education is all round development of child's personality. This includes his physical, mental, moral and intellectual development. The other aims of Buddhist Education are to make a free man, a wise, intelligent, moral, non-violent and secular (Rahula, 2015).

However, the rise of Buddhist monasteries as centers of learning in the 6th century BCE was marked by the disintegration of the *gurukul* system (Majumdar, 2017). In the early medieval period temples of south India developed into centers of education. At a much later period there developed the '*Namaghar*' in Assam and '*Bhagvat Tungi*' in Odisha which became the centers of mass education in their respective states. By this time several institutions of a formal kind had also been established (Pandey, 1984).

All the above institutions aimed at inculcating some sort of values into their pupils through the system of education. There was a cordial relationship between the teacher and taught. Education had a spiritual base. *Namagharas* in Assam or *Bhagavat Tungis* in Odisha were purely established for religious purpose though later on they were turned to be centers of mobilizing mass education. This spiritual base of education had undoubtedly created the ground for the development of moral character in children. Educational institutions were still considered as sacred places and values like truth, love, kindness, service etc. had their own significance.

The medieval period in India was also marked by the destruction or deterioration of many ancient centres of learning and education. However, scholars like B.N. Luniya (1978), opined that with the invasion of Muslim conquerors nearly all the centers of higher learning of the Hindus and Buddhists were destroyed. Temples and educational institutions and libraries were put to destruction and they were replaced by mosques. In spite of such merciless and extensive destruction, Hindu educational institutions remained a living reality. They sustained strength from its inherent vitality and vigour and maintained the Hindu education system. Even during the reigns of terror and turmoil, merciless persecution and wanton destruction, the Hindu culture and scholarship continued to survive, though it had to migrate to more congenial regions within the country.

However, the system of education was interrupted by the advent of the British in general and that of Macaulay System of Education in particular. The system of education introduced by Macaulay in 1835 aimed at producing a volume of loyal white collar Indian employees for British administration (Srivastav, 1995). With the introduction of Wood's Dispatch in 1854, English became the fashion of the educated elite in India. Along with the introduction of English as the medium of instruction there also started the westernization of Indian education and culture. The few English educated Indians considered themselves superior to the common mass of India and alienated themselves from large bulk of society. They took it a pride to follow everything western. Thus, it destroyed the idealistic nature of education. The *guru* was no longer revered as a father nor does the pupil was treated as a son. The humanistic character of education was totally lost. There was nothing in the educational system which could be termed as spiritual. The trend was not even revised after independence. The system continues even today with a little modification.

The result is that from a totally value based education we have now an education system totally devoid of values. The present education system imparts knowledge devoid of wisdom. It only aims at giving some information to the child. Rote memorization of those information leads to sure success in examination. This in turn changes the school from a place of social harmony to a field of cutthroat competition. Education fails to save one from envy and rivalry. It does not save one from the

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clutches of lust and anger. Pupils are no longer treated as *brahmachari*. Education does not teach him to control his self and to see the material wealth in a disinterested manner. On the other hand it teaches man to acquire wealth by any means and to enjoy worldly pleasures irrespective of usual ethical considerations. Teachers are no longer treated as role-models for students who may teach one thing in the classroom and do the opposite outside. The teacher provides only theoretical knowledge without wisdom. School is without ideals and principal is without principles. Such a system produces man devoid of any value.

Human society as a whole has made remarkable progress in the field of science and technology. But man has lost the higher goal of peace, harmony and inner happiness. The world has achieved economic growth. At the same time it has taught the science of exploitation. In the name of religion, education has taught communalism. In the name of social harmony, it has taught narrow racial discrimination, mutual distrust and suspicion. While the poor and unprivileged of our country do not have means even to get two meals a day, there are affluent people who live in the midst of all sorts of luxuries. Man has lost all emotion towards his fellow-men.

The fault is not of man. It is the fault of our defective and improper materialistic education that produces such men. Instead of imparting the Vedic values of love, sacrifice, service, tolerance etc. it teaches the teaching of Nietzsche for whom life is essentially appropriation, injury, conquest of the strange and weak, severity and exploitation. The theory of Nietzsche had contributed a lot for the rise of Hitler, the sole figure behind the World War II. While the edifice of the entire education system is built on this theory, then it is sure to give birth to hundreds and thousands of Hitler leading the whole world to the catastrophe of a war that would be hundred times more dangerous and destructive than the Second World War. Such a war would result in the total extinction of man from earth.

There is erosion of value in all aspects of education. Consequently there is erosion of value in all spheres of human life. Modern education has produced only incomplete man. It trains human body and mind at the negligence of human spirit. A complete man is not only materially well off, but even spiritually rich. It is the task of education to prepare the whole man by an integral training of the body, mind and spirit. It is the task of education to train people to think rightly and constructively so that he can apply his knowledge for constructive purposes for the welfare of entire humanity. But our traditional educational basis has failed to achieve the desired goals and has landed us into trouble of all sorts. As educated persons we should not stick to that system of education which has made our life miserable by bringing discontent and destruction into it. The only alternative is switching over to the spiritual basis of education. It is only by the arousal of spiritual nature of man that his inner potentialities can be directed in a constructive way. Spiritual basis of education can achieve those things which the present system of education has failed to achieve. Therefore, the curriculum must include some important aspects of spirituality depicting values par excellence. The Religious Education Committee (1946) has recommended the teaching of spiritual values in the following word:

"Spiritual and moral teaching common to all religions should be an integral part of the curriculum and provision of facilities of instruction there in should be a responsibility of the state. An agreed syllabus incorporating the spiritual and moral teachings common to all religions should be formulated."

Similarly Dr. Radhakrishnan Commission (1948-49), Mudaliar Commission (1952-53), Kothari Commission (1964) and many other committees and commissions insisted on the inclusion of moral and spiritual education in school curriculum. It is through a spiritual basis of education that the improper and defective materialistic education can be replaced by a proper system of education that can transform man into divine by arousing his spiritual nature. Spiritual nature is marked by the presence of qualities or attributes such as love, peace, non-violence, truthfulness, honesty, self-control etc. and the absence of pride, egoism, envy and hatred. These are the qualities that the present world needs for its survival. Only spiritual leaders can save the modern world from the volcano of nuclear destruction. Hence education should intend to inculcate a spiritual attitude of life in its students by adopting a spiritual basis of education.

IMPLEMENTATION

Ways and means should be developed to provide spiritual education as part of the streams of formal, and non-formal education. Though informal education is out of control of educational agencies, the formal and non-formal agencies of education can be moulded to introduce methods of providing education in spirituality.

A value-centered syllabus is an effective method of promoting education for spiritual values. These spiritual values and principles can be made the objectives of several aspects of theoretical education (Vyas, 1986).

Orientation programmes can be arranged on a regular basis to offer courses in spiritual values.

Work experiences are attached to all educational institutions and have become an accepted mode of correlated activity. It can be used for the provision of spiritual education. Suitable techniques should be introduced for developing work experience with reference to the spiritual values.

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Reading materials in the form of text-books, pamphlets or booklets etc. can be prepared to inculcate spiritual values among students.

Last but not the least selected prayers capable of arousing spiritual sentiments of students should be sung in the prayer meeting or morning assembly. Prayer is regarded as the best link between life and spirituality.

CONCLUSION

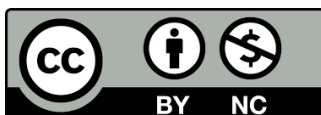
Modern world has solid faith in the method of experiment. All the physical sciences are based on experimental truth. An experiment in education based on spiritual foundations may be done in schools to find out the real growth of man that emanates from spiritual souls and enlightened minds.

The best description of man is a spiritual animal. It implies that though man appears to be an animal, he has a fire of spirituality laying dormant in him. It is the task of education to rouse that fire so that the animal in man shall be transformed in something like divine. He is not to be educated only because he will be required to be an engineer, doctor, teacher or politician. He is to be educated so that he can develop into a complete man which is best possible through spiritual education.

It is not possible to substitute the modern education with spiritual or moral value. However, it is possible to find a harmonious co-ordination between modern trends in education and spiritual values. Mere knowledge cannot help in the real growth of personality. Therefore, education should aim at a balanced growth of both knowledge and spiritual wisdom.

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Utilization of The Chronic Disease Management Program (Prolanis) of BPJS Kesehatan in Gowa District-Indonesia



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ABSTRACT: The Chronic Disease Management Program (Prolanis) is an effort of the government and BPJS Kesehatan to carry out health care for BPJS Kesehatan participants who suffer from chronic diseases to achieve optimal quality of life with health care costs effective and efficient. Primary Level Health Facilities (PLHF) such as Puskesmas, Family Doctors, and primary care clinics that have collaborated with BPJS Kesehatan are obliged to implement Prolanis. This study aims to determine the relationship between enabling factors and need factors on the use of Prolanis. This research is a type of analytic survey research with a cross sectional approach which is carried out in several PLHFs, namely; Gentungan Health Center, Manuju Health Center and Tinggi Moncong Health Center. The population in this study were participants in the prolanis activities at the PLHF. The number of samples in this study were 107 people. The results of this study indicate that the factors that influence the use of prolanis in PLHF are; Educational history (0.001), income (0.029), BPJS Kesehatan membership class (0.019), role of health workers (0.001) and timeliness of implementation of prolanis activities (0.048). Factors that do not affect the use of prolanis in PLHF are; Gender (0.369), Age (0.169), Occupation (0.103), Distance from house to PLHF (0.353), Family support (0.413), Knowledge (0.145), Need for prolanis (0.400) and disease control (0.315)

KEYWORDS: Chronic Disease, Enabling factors, Need factors, PROLANIS, Utilization of Health care

INTRODUCTION

Chronic disease is a type of degenerative disease that develops or persists for a very long period of time, which is more than six months. Based on the results of Riskesdas, it was found that there was an increase in the prevalence of non-communicable diseases or chronic diseases.¹ Riskesdas 2018 when compared to Riskesdas 2013, has increased, including cancer, stroke, chronic kidney disease, diabetes mellitus, and hypertension. Based on examination of blood sugar, the prevalence of diabetes mellitus increased from 6.9 percent to 8.5 percent; and the results of blood pressure measurements, hypertension rose from 25.8 percent to 34.1 percent.^{1,2} Hypertension is still a big challenge in Indonesia because of a condition that is often found in primary health care. This is a health problem with a high prevalence of chronic diseases in Indonesia. In addition, hypertension control is inadequate even though effective drugs are widely available.³

Chronic disease is the biggest cause of death with quite a large proportion including very large financing, namely 60% of the health financing of all people in Indonesia and this chronic disease can be prevented.^{4,5} Therefore, in the treatment of chronic diseases, it is necessary to carry out a health program that is promotive, preventive, curative, and rehabilitative on an ongoing basis. Because if there is no full attention from the start it will have an impact on the high cost of health, so there needs to be a breakthrough program, namely the Prolanis program.⁵

Prolanis is a health service system and a proactive approach implemented in an integrated manner that involves BPJS Participants, Health Facilities and BPJS kesehatan in the framework of health care for BPJS Kesehatan participants who suffer from chronic diseases to achieve optimal quality of life with cost-effective and efficient health services. Prolanis activities encourage participants with chronic diseases to achieve optimal quality of life with an indicator that 75% of registered participants who visit the First Level PLHF have "good" results on specific examinations for Type 2 DM and Hypertension according to the relevant Clinical Guidelines so as to prevent disease complications.⁵

Primary Level Health Facilities (PLHF) such as Puskesmas, Family Doctors, and primary care clinics that have collaborated with BPJS kesehatan are obliged to implement the Chronic Disease Management Program (Prolanis) initiated by BPJS kesehatan. Based on our observations during the implementation of Prolanis in one of the PLHFs, it was shown that the average involvement

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of BPJS participants who suffered from chronic diseases (hypertension and diabetes) was only 10%, below the target safe zone. This indicates the low utilization of Prolanis services at PLHF BPJS Kesehatan.

Previous research on the use of Prolanis activities shows that there is a significant influence between Prolanis service information ($p = 0.020$) and schedule / time suitability ($p = 0.008$) on the use of Prolanis in PLK Unair.⁶ While the variables of BPJS class, distance traveled, travel time, availability of transportation, type of transportation, social relations, health workers, health facilities, waiting time and needs do not have a significant effect.⁶ Other studies on factors related to the use of prolanis chronic disease management programs show that there is a significant relationship between knowledge of disease, BPJS kesehatan support and family support with the use of chronic disease management programs.⁷ There is no relationship between age, sex, education, occupation, mileage and travel time to the first level of PPK and peer support with the use of prolanis.⁷ The purpose of this study was to determine the factors associated with the use of the Chronic Disease Management Program (PROLANIS) at the PLHF BPJS Kesehatan in Gowa Regency based on enabling factors and need factors.

SUBJECTS AND METHODS

This research was conducted in April - May 2020 at PLHFs that have collaborated with BPJS Kesehatan and are temporarily implementing the implementation program for the management of Cornis disease (Prolanis). The selection of research locations was based on the geographical location of the PLHF, which represented lowland areas, namely Gentungan Public Health Center, hilly areas namely Manuju Health Center and upland areas namely Tinggi moncong Health Center.

The sample in this study were KIS / BPJS participants who were registered in the PLHF, registered as prolanis participants and routinely participated in prolanis activities with a total sample of 107 people obtained by total sampling. This type of research is an analytic survey with a cross sectional approach. Primary data were obtained through interviews using a structured questionnaire and secondary data were obtained from health center prolanis managers. Data analysis using the Statistical for Social Science (SPSS) application by presenting sample characteristics, to determine whether there is a relationship between enabling factors and needs factors for prolanis utilization through the Pearson chi square test.

RESULTS

Based on the results of the research in Table 1, it shows the characteristics of the respondents who took part in prolanis activities, namely that the female gender was the most participant (67.3%). Age the most is people aged over 59 years (40.2%). Respondents with the most recent education history were respondents who had completed elementary school (29.9%). Most of the respondents in the family were members of the family (64.5%). Most of the respondents' monthly income (60.7%) is below the provincial minimum wage, that is, with income below Rp. 2,941,270.

Table 1. Distribution of Responden Characteristics

Distribution of Responden Characteristics	n = 107	%
Gender		
Male	35	32.7
Female	72	67.3
Age		
<45 years	23	21.5
45 - 59 years	41	38.3
> 59 years	43	40.2
Education History		
Not Schooling Elementary School	17	15.9
Graduated Elementary School	32	29.9
Graduated Junior High School	19	17.8
Graduated Senior High School	19	17.8
Graduated College / Bachelor Degree	20	18.7
Status in the Family		
Head of Household	38	35.5
Household Members	69	64.5
Monthly Income (UMP SULSEL)		
<Rp. 2,941,270	65	60.7
> Rp. 2.94127 million	42	39.3

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Table 2. Distribution Frequency for Enabling Factors (enabling factor), Factor Needs and Utilization Prolanis BPJS

Frequency Distribution	n =	107%
Class BPJS Membership		
<i>Class I</i>	38	35.5
<i>Class II</i>	10	9.3
<i>Class III</i>	59	55.1
Distance House To health facilities		
<i><3 km</i>	46	43.0
<i>> 3 km</i>	61	57.0
Role of health workers		
<i>Good</i>	82	76.6
<i>Lack of</i>	25	23.4
Family support		
<i>Good</i>	84	78.5
<i>Lack of</i>	23	21.5
Knowledge about Prolanis		
<i>Good</i>	59	55.1
<i>Lack of</i>	48	44.9
Punctuality of Prolanis implementation		
<i>On time</i>	79	73.8
<i>Not on time</i>	28	26.2
Variable Needs Factor (Need Based Factor)		
Prolanis Service Needs		
<i>Requires</i>	105	98.1
<i>Less Need</i>	2	1.9
Chronic Disease Suffered		
<i>Hypertension</i>	63	58.9
<i>Diabetes Mellitus</i>	20	18.7
<i>Hypertension and Diabetes Mellitus</i>	24	22.4
Utilization of Prolanis Program		
<i>Routine</i>	83	77.6
<i>Not Routine</i>	24	22.4

Table 2. Shows the frequency distribution of factors enabling *factors*, need factors and utilization of the BPJS kesehatan at PLHF. The *enabling factors* in this study were based on the membership class of BPJS Kesehatan, most of the respondents were registered as class III participants, namely 55.1%, the distance from the respondent's house to health facilities, most of which was more than 3 km, namely 57.0%. Most of the health workers were respondents who stated that the role of health workers was good as many as 82 respondents with a percentage of 76.6%, the rest were respondents who stated that the role of health workers was lacking, namely 25 respondents with a percentage of 23.4%. The distribution of respondents based on the most family support was respondents with good family support as many as 84 respondents with a percentage of 78.5%, the rest were respondents with less family support as many as 23 respondents with a percentage of 21.5%. The distribution of respondents based on knowledge about PROLANIS BPJS Kesehatan is mostly respondents with good knowledge about PROLANIS as many as 59 respondents with a

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percentage of 55.1%, the rest are respondents with less knowledge about PROLANIS as many as 23 respondents with a percentage of 44.9%. The most distribution of respondents based on the punctuality of PROLANIS implementation was on time as many as 79 respondents with a percentage of 73.8%, the remaining respondents who stated that the implementation of PROLANIS was not on time were 28 respondents with a percentage of 26.2%.

Table 3. Relationship Factors Enabling / Pusher (Enabling Factor) Utilization against Prolanis BPJS

Factors Enabling / Pusher (Enabling Factor)	Utilization Program				P-Value
	Prolanis		Program		
	Routine		Not Routine		
	n	%	n	%	
BPJS Participation Class					
Class I	35	92.1	3	7.9	P = 0.019
Class II	8	80.0	2	20.0	
Class III	40	67.8	19	32.2	
Distance from house to health facilities					
<3 km	37	80.4	9	19.6	P = 0.353
> 3 km	46	75.4	15	24.6	
The Role of Health Officers					
Good	58	70.7	24	29.3	P = 0.001
Poor	25	100	0	0	
Family Support					
Good	66	78.4	18	21.4	P = 0.413
Poor	17	73.9	6	26.1	
Knowledge of Prolanis					
Good	43	72.9	16	27.1	P = 0.145
Less	40	83.3	8	16.7	
Punctuality of Prolanis Implementation					
Timely	65	82.3	14	17.7	P = 0.048
Not Timely	18	64.3	10	35.7	

Table 4. Relationship of Need Based Factors to Utilization of Healthcare BPJS Prolanis

Need Factors (Need Based Factor)	Utilization of Prolanis				P-Value
	Routine		Not Routine		
	n	%	n	%	
Prolanis Service Need					
Requires	82	78.1	23	21, 9	P = 0.400
Less Need	1	50.0	1	50.0	
Chronic Disease Control After Following Prolanis					
Hypertension	36	70.6	15	29.4	P = 0.315
DM	1	100	0	0	
Hypertension & DM	4	100	0	0	
Normal	42	82.4	9	17.6	

DISCUSSION

1. Relationship of enabling factors /Enabling factors for the utilization of the BPJS Kesehatan chronic disease management program (PROLANIS) at the PLHF.

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Based on the results of the bivariate analysis to determine the relationship between enabling factors and the utilization of BPJS Kesehatan prolanis to produce; p-value for participation class is 0.019, p-value for the distance of the participant's house to PLHF is 0.353, p-value for the role of health workers, p-value for family support is 0.413, p-value for knowledge is 0.145 and p-value for timeliness of implementation is 0.048.

Enabling factors for participants to take advantage of chronic disease management programs, namely the class of participation, the role of health workers and the timeliness of implementation based on the results of statistical tests resulted in a p-value less than alpha, namely 0.05, which means that the class of participation, the role of health workers and timeliness of implementation have a relationship to utilization BPJS Health chronic disease management program (Prolanis). This research is in line with research conducted by Viona (2018) which states that the use of prolanis is significantly influenced by the role of health workers.⁸

In a study conducted by Viona (2018) stated that the main reason respondents did not know about the existence of prolanis activities at the puskesmas was because health workers had never provided information about the existence of prolanis. According to research conducted by Abdullah (2017) regarding the factors causing the decrease in the number of visits from chronic disease management program participants at the Minasa Upa Public Health Center in Makassar City, Abdullah argued that the role of health workers has a significant relationship to the number of visits from chronic disease management program participants. The research conducted by Auliya (2018) is in line with this research by stating that the use of prolanis in PLK Unair is influenced by time suitability.^{8,9,10}

Enabling factors for the use of prolanis such as the distance from the house to the PLHF, family support and knowledge after the analysis using the chi square test resulted in a p value greater than Alpha, which means that the distance from the house to the PLHF, family support and knowledge are not related to the utilization of BPJS Health prolanis.

This research is not in line with the research conducted by Shella (2019) which states that knowledge, family support, support for health workers and the severity of disease are related to the use of prolanis at public health centers in the city of Semarang. In a study conducted by Shella (2019), it was stated that out of 118 respondents categorized according to the number of visits and participation of respondents in prolanis activities, they were divided into 2 categories, namely, 60 respondents in the low utilization category and 58 respondents in the high utilization category. Based on the results of observations and interviews conducted, Shella (2019) states that there are several possible respondents with the use of prolanis who are still unsure. First, respondents often forget about the implementation date of the prolanis. Second, on the day of the implementation of the prolanis the respondents were in an unhealthy condition. Third, respondents felt that they did not need to participate in pro-planning activities because they felt that their bodies were still healthy. Fourth, if there are other activities or events on the same day as the implementation of the prolanis, the respondents prefer to attend the event. Fifth, there were respondents who physically had difficulty reaching the PLHF to participate in pro-planning activities. Sixth, there is no family accompanying the prolanis activities. The low utilization of prolanis will not only affect the health of the participants but will also affect the payment for the number of capitation received by the puskesmas from BPJS Kesehatan. If the ratio of visiting prolanis participants does not reach the minimum indicator, the number of capitation will decrease. This is able to have an impact on the services that will be provided by the puskesmas to the participants.¹¹

2. Relationship of need based factors to the utilization of the BPJS Kesehatan chronic disease management program (PROLANIS) at the PLH.

Based on the results of the bivariate analysis to determine the relationship between need based factors and the utilization of BPJS Health prolanis, the results are; p-value of prolanis requirement 0.145 and disease control prolanis participant 0.315. The need factor in this case is the need for a chronic disease management program and disease control, after an analysis using the chi square test results in a p value greater than Alpha, so the need for prolanis and disease control is not significantly related to the utilization of the BPJS Kesehatan chronic disease management program. This research is in line with research conducted by Viona (2018) which states that in the work area of the Mandala Public Health Center in 2018, the use of prolanis is not influenced by the need for prolanis services.⁸

Notoatmodjo in Viona (2018) states that the amount of use of health services by a family is a character of the family's disposition, abilities and needs for medical services, so that all these components are considered to have their own role in understanding the differences in the use of health services, while needs are a more important factor. versus predisposing factors and abilities. The greater the perception of the respondent's need for prolanis services, the greater the possibility of increasing the utilization of the BPJS Kesehatan chronic disease management program.

In a study conducted by Vest (2013), it was stated that even if chronic disease sufferers need a chronic disease management program with self-management, with less income and sufficient needs, chronic disease sufferers will experience

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obstacles in carrying out self-management. Similar to this study, out of 107 respondents, only 2 respondents who less need a chronic disease management program, but 23 people who do not routinely follow prolanis. Thus, it can be concluded that the need for a chronic disease management program (prolanis) has no relationship with the use of prolanis.¹²

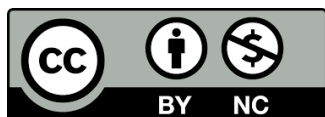
CONCLUSIONS

Characteristics of respondents related to the use of chronic disease management programs are the variables of education and income. Characteristics of respondents that were not related to the use of chronic disease management programs were gender, age, and employment status variables. Enabling factors related to the use of chronic disease management programs were the class of participation variables, the role of health workers and the timeliness. Enabling factors that relate to the use of chronic disease management programs are the variable distance from the house to the PLHF, family support and respondent knowledge.

Need based factors, in this case the need for prolanic services and disease control, have no relationship with the use of management programs. chronic disease. However, the results showed that there were positive changes, namely that the respondents did not suffer from Cornis disease based on blood pressure checks and blood glucose levels became normal as much as 47.7% following prolanis activities regularly.

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Information and Communication Technology (ICT) Skill and Quality Medical Care in Federal Medical Centre, Owo, Ondo State, Nigeria



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ABSTRACT: Quality medical care connotes a medical service with inherent ability to meet desired health outcome. Quality medical care is of concern to everyone. This is because it is important to human welfare and efficiency. The situation in Nigeria's hospitals as depicted in literature and observed by many is worrying. The quality of medical care services available in the Federal Medical Centres (FMCs) in Nigeria is worrisome and of concern to everyone. Empirical evidences in literature have shown that Information and Communication Technology (ICT) skill has positive impact on several professional output including medical service. It is believed that ICT proficiency of medical practitioners could contribute to a higher quality of medical care services. This study therefore examined the influence of ICT skill on the quality of medical care in FMC Owo, Nigeria.

Method: The study is based on post-positivist epistemology. Quantitative research method and survey research design were adopted. Out of the 95 population of medical doctors, a total of 76 of them, obtained through Krejcie and Morgan sample size table, were surveyed using convenience sampling technique. The doctors were surveyed using a five scale Likert-like adapted structured questionnaire research instrument and a 95% return rate was achieved.

Results: The study found that ICT skill positively and significantly influenced quality of medical care with a P value of 0.000 ($p < 0.05$) in FMC Owo, Nigeria. This shows that there is a positive and significant influence of ICT skill on quality medical care. The quality of medical care in the hospital is good with an overall mean of 3.35 on the scale while the level of ICT skill among doctors is high with an overall mean of 3.84.

Conclusion: The study concluded that ICT skill has positive and significant influence on quality of medical care. Therefore, there is need to sharpen the ICT skill of medical practitioners through government and institutional support towards sustaining and further improving the present medical care quality.

KEYWORDS: Digital Literacy, Federal Medical Centre, Information and Communication Technology Skill, Medical Care, Nigeria, Owo, Quality medical care.

INTRODUCTION

Quality medical care is the degree to which medical care services rendered to patients meet the desired health outcome (WHO, 2020). Every patient desires standard medical care services rendered in the most professional way to guarantee quick restoration of health and capacity. This desire requires that medical care services must be safe, efficient, timely, effective, accessible, patient-centred, responsive, acceptable, affordable and reliable. Achieving this demands an all-inclusive approach as advanced by the Donabedian's SPO theory of quality medical care. The SPO theory of quality medical care explains the phenomenon of achieving the desired medical outcome through the establishment and interplay of good structure and process.

This means that adequate structure and process results in the desired medical outcome. Structure refers to the array of resources such as adequate physical buildings, furniture, equipment, drugs, medical consumables, right personnel and machines. While process is the activities of the medical care givers in translating the resources into services in an acceptable way. It includes: arrangement for doctor-patient consultation treatments, reasonable patient waiting time, friendliness of staff, responsiveness to patients' requests/needs, physical and clinical examination, empathy, referral system, effectiveness, professionalism, effective communications, pre-packing of medicines, pharmacological services, counselling, efficiency, appointment system, defaulter tracking and attendance to patients. Finally, the outcome is the end-result of the interplay between structure and process manifesting in the restoration of health, patient satisfaction, commendation of care-givers, patronage, referral of others, cooperation, good quality of life, good health-seeking behaviours and reduction in complaints.

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The quality of the medical care services available to patients in Nigeria is observed to be substandard (Ameh et al., 2020; Akindele, 2019; Odunaiya, Akinpelu, Ogwu, & Aje, 2019; Ephraim-Emmanuel, Adigwe, Oyeghe & Ogaji, 2018; Izugbara & Wekesah, 2018). Most physical facilities such as buildings are not built to suit purpose and are poorly maintained, infrastructure such as electricity and access road to and within the hospital are in deplorable states. Many of the hospitals as well as citizens' residences lack portable water supply, most hospital equipment are obsolete, dysfunctional and inadequate for today's medical practice, there is inadequate staffing and poorly motivated staff in terms of timely remunerations as well as staff motivation factors such as training and reward system. Also, affordability and availability of drugs and consumables required to effectively treat patients is a mirage in many of the hospitals. There is compromise of safety of patients from harm or threat of harm, patient waiting time is unreasonably long, most hospital staff are unfriendly and irresponsive to the needs of the patients, lack of empathy is a common phenomenon and the referral system is deficient (Odunaiya, Akinpelu, Ogwu, & Aje, 2019).

The consequences of this poor quality medical care services is enormous. Among them are loss of lives, incapacitations, loss of hospital reputation and patronage, loss of revenue, increased healthcare cost burdens on individuals and governments, loss of individual national productivity, poverty, crime and social unrest.

Information and Communication Technology (ICT) is an equipment that integrates telecommunications, computers, storage devices and application software for the creation, transmission, access, manipulation and use of information resources. It is the equipment and accessories used for modern computing. Although there is no universally accepted definition of ICT, it is widely accepted as any device, network resources, application software and systems that are integrated to promote interactions in today's digital world. United Nations Educational, Scientific and Cultural Organization (UNESCO) defines ICT as the forms of technology that are used to transmit, process, store, create, display, share or exchange information by electronic means (UNESCO, 2019). ICT is sometimes used synonymously with Information Technology (IT). However, ICT is generally used to represent a wider and more comprehensive list of all components related to computer and digital technologies than IT. This is because while IT is only limited to information devices, ICT integrates telecommunication devices into Information equipment thereby making it more robust and comprehensive than IT.

ICT skill is the ability to accept, use and produce digital contents using Information and Communication Technology (Noh, 2016). It is the ability to use Information and Communication Technology (ICT) tools to find, locate, manage, integrate, evaluate, create, communicate and share information necessary for relevance and success in today's knowledge society (Sharma, Fantin, Prabhu, Guan & Dattakumar, 2016). Therefore, to be digitally literate, someone must possess information, communication, photovisual, reproduction as well as socio-emotional and real-time skills (Eshet-Alkalai, 2012). According to Kennedy and Yaldren (2017), ICT skill in healthcare is measured using the competencies of medical practitioners in data/information, digital branching and communication, collaboration/real-time, socio-emotional/safety, media/photo-visual, reproduction skills.

Many scholars believe the efficient application of ICT in healthcare can help improve the quality of medical care. However, it will be almost impossible to appropriate and maximize the potential benefits of ICT when its technical know-how is not understood. It therefore become important to understand the technology and how it can help address quality issues in medical care before its benefits can be appropriated. Unfortunately, the condition is different in Africa, especially Nigeria where most of the citizens are not ICT literate due to several reasons. Some of the reasons include poverty, inequality, sociocultural barriers, language and the generally high level of illiteracy. Most Nigerians lack personal computers while several million others have no formal education (Ifijeh, Iwu-James & Adebayo, 2016).

In view of the assumption that ICT skill influences the quality of medical care and the gap in literature as to the truthfulness of this assertion in FMCs in Nigeria, this study became necessary to:

1. Identify the quality of medical care services in FMC Owo, Nigeria;
2. Identify the level of ICT skill among doctors in FMC Owo, Nigeria; and
3. Determine the influence of ICT skill on the quality of medical care services in FMC Owo, Nigeria.

The researcher hypothesized that ICT skill does not significantly influence the quality of medical cares in FMC Owo, Nigeria. This research assumption was subjected to statistical tests using empirical data to confirm or refute the assumptions at 95 percent (95%) level of confidence ($P < 0.05$).

METHOD

This study adopted a survey research design. The population of the study are the 95 medical doctors in the Hospital as obtained from the office of the Chief Medical Director of the hospital. Using the Krejcie and Morgan table for sample size calculation, a total of 76 samples were reached. This total of 76 medical doctors in the FMC were surveyed using convenience sampling technique in view of varied duty schedules and difficulty to find study participants. Survey data for the study was collected using the

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questionnaire instrument. The questionnaire on ICT skill was adapted from the work of Son, Park and Park (2017) while the one on quality of medical care was adapted from the work of Marshall and Hays (1994). The adapted structured instrument is a five-point likert-like scale which was subjected to validity and reliability tests to enhance the credibility of the study. Reliability test of the instrument was done using the Cronbach's Alpha tests. This returned Cronbach's Alpha score of 0.98 for ICT skill of Doctors and 0.96 for quality of medical care. This suggested a high level of internal consistency among the survey items used in the study.

Data collection was done over a period of 2 weeks with the help of a trained research assistant. Data analysis was done using the Statistical Product and Services Solution (SPSS) version 21. Data from the returned questionnaires were collected, collated and inputted into the computer system. Descriptive statistical analyses were carried out to describe the pattern of occurrence of the phenomena under investigation. Also the influence of ICT on quality of medical care phenomena was analyzed using simple linear regression analysis. This informed the inferences and conclusions that was drawn in the study.

Ethical approval was obtained from the research ethics committee with number: BUHREC 292/21 dated 6th April, 2021. Respondents were given time to review the consent form and ratify it before proceeding with the survey. Confidentiality of respondents was protected and survey data was properly secured in locked cabinets and pass-worded personal computer.

RESULTS

72 out of the 76 questionnaires were returned and fit for use making a 95% return rate. Out of the 72 medical doctors surveyed, 75% (n=54) are male while the remaining 25% (n=18) are female. 50% of the doctors are within the ages of 31-45 years (n=36) with 70% (n=50) having less than 11 years clinical experience. Most 28% (n=20) of them are also medical officers and the least 3% (n=2) have attained the highest rank of Chief Consultant.

A Decision Rule of 1.0 - 1.7 = Very Poor; 1.8 - 2.5 = Poor; 2.6 - 3.3 = Fair; 3.4 - 4.1 = Good; 4.2-5.0 = Very Good was developed for the study and the quality of medical care services has an overall mean of 3.35 on the scale. This means that the quality of medical care in FMC Owo is good.

Similarly, with a decision rule of 1.0 - 1.7 = Very Low; 1.8 - 2.5 = Low; 2.6 - 3.3 = Moderate; 3.4 - 4.1 = High; 4.2-5.0 = Very High, the level of ICT skill has an overall mean of 3.84. This means that the level of ICT skill among doctors in FMC Owo, Nigeria is high. Lastly, ICT skill positively and significantly influenced quality of medical care with a P value of 0.000 ($p < 0.05$) in FMC Owo, Nigeria. This shows that there is a positive and significant influence of ICT skill on quality medical care in FMC, Owo.

Table 1. The influence of ICT skill on quality of medical care in FMC Owo.

Variables	Beta (β)	T	Sig.	R ²	Adj. R ²	F	p
(Constant)		11.843	.000	0.063	0.060	19.436	0.000
ICT Skill	.252	4.409	.000				
Dependent Variable: Quality of Medical Care							
Predictor: ICT Skill							
DF (F-Statistic) = 1, 71							
DF (T-Statistic) = 72							

DISCUSSION OF FINDINGS

The study found that most of the medical doctors in the study area are males. This demographic finding is in line with the data from the register of Medical and Dental Council of Nigeria which says only 35% of the total 74,543 medical doctors in Nigeria are females. Similarly, most of these medical practitioners have less than 11 years' work experience probably because of high rate of medical brain drain in the country (Kirigia, Gbary, Nyoni, Seddoh & Muthuri, 2006).

Surprisingly, the quality of medical care in the FMC under study was found to be good contrary to the results from many other empirical studies such as those of Ameh, et al (2020); Odunaiya, Akinpelu, Ogwu and Aje (2019) and Odetola and Fakorede (2018) which discovered that the quality of medical care in Nigeria's hospitals is poor. However, the finding may be a confirmation of the work of Roder-Dewan, et al (2019) which submitted that patients in Nigeria are often satisfied with low quality service (Roder-Dewan, et al, 2019). This may also be a confirmation of the argument that several investments in the healthcare system by the government and non-governmental organizations are beginning to yield positive results.

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In the same vein, contrary to widespread opinions, the level of ICT skill among doctors in FMC Owo, Nigeria is found to be high. This contradicts the findings from the works of Hassan (2019) as well as that of Kanjo and Kaasboll (2019). However, this might have been explained by the result of the work of Porat, Blau and Barak (2018) where the researchers discovered that staff often over-estimate their ICT capability (Porat, Blau & Barak, 2018). It is also important to note that this category of Nigerians are literate and highly skilled by virtue of their medical training. This may have informed their personal and professional development as well as ICT capacity enhancement.

The study found a significant relationship between ICT skill and the quality of medical care. This supports the findings of Blumer and Pimmer (2019) and that of Kennedy and Yaldren (2017).

CONCLUSION

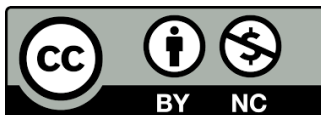
Although the level of the quality of medical care in FMC Owo is considered high, there is need for its further improvement towards achieving the desired very high quality medical care. This, if achieved, will reassure citizens and restore their hope in the Nigeria's medical care system. The result of the influence of ICT skill on quality of medical care in this study has shown that the desired quality of medical care can be achieved if more investments can be made to enhance the ICT competence of the medical care providers in the hospital. Government and hospital management should therefore encourage improved ICT competence among medical care providers by providing adequate number of ICT devices for them to work as well as subsidize personal ones for them to acquire. Further studies to ascertain the ICT skill claims of medical doctors through practical engagements should be conducted in future.

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Monitoring The Content of Heavy Metals in The Soil and Wines from Different Wine-Growing Areas of Romania



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ABSTRACT: Determination of heavy metals in soil and wine is very important for wine quality and consumer health, but at the same time it is a complementary tool for differentiating wines according to their geographical origin. In this work, soils and ten brands of wines originated from four major wine-growing areas of Romania (Iași, Babadag, Ștefănești and Blaj) were considered for performing a multielement (Cr, Ni, Cu, As, Pb, Hg, V, Sr, Mn, Zn, Fe) investigation in order to assess regional specificity. Heavy metals found in the investigated wines were below the limits imposed by European standards (O.I.V.) the elements concentrations following the trend: Zn>Fe>Mn>Sr>Ni>Cr>Cu>Pb>V>Hg>As. For the soils analyzed, the heavy metals content was found to be below the maximum permitted limit, except for Cu (135.45 mg/kg) from the Iași vineyard, which was at the permitted limit. The high values obtained for copper may be the result of different treatments with the Bordelaise solution for the vine. The elements CA, Mn and Hg observed from the research that they are predominantly of natural origin. Based on our results, a distinction has been made between wines according to their geographical origin, considering that the specific elements of discrimination Sr, Pb, and Ni for the Ștefănești vineyard (Muntenia region), Cr and Hg for the Babadag vineyard (Dobrogea region), Sr and V for the Iași vineyard (region of Moldova), respectively Fe and Zn for the Blaj vineyard (Transilvania region).

KEYWORDS: Wine, soil, heavy metals, ICP-MS, HR-CS-AAS, wine-growing area

I. INTRODUCTION

Obtaining wine was one of the oldest occupations of the Romanians, reaching the time of the dacians and romans. Wine was among the first alcoholic beverages produced and the most widespread in Romania. A special importance was reserved for the classification of wines by varieties, geographical areas and years of production. (Arvanitoyannis et al, 1999; Serrano-Lourido et al, 2012; Boschetti et al., 2013; Košir et al, 2014; Dugo et al, 2015). Most illegalities at wines are made by declaring some wines being obtained from noble and pure grape cultivars. The wines can be obtained by blending from various grape cultivars; therefore a special importance is manifested for the classification and identification of wine varieties (Huang et al, 2017).

Research into the evaluation of the authenticity of food products has increased in recent years and particular attention is paid to their quality and composition. Evaluation of these products involves the determination of food characteristics such as nutritional parameters, shelf life and healthiness (Woldemariam et al, 2011; Danezis et al, 2016; Zava et al, 2020). Due to food fraud, which can have a negative impact on human health and the economic market, producers and ordinary consumers have understood the benefits of protecting traditional or appreciated products (Everstine et al, 2013).

In order to identify the important compounds for the fingerprinting of the wine, it is done through the instrumental analysis. (Héberger et al, 2003; Franquet-Griell et al, 2004; Kiss et al, 2005; Regmi et al, 2012; De Villiers et al, 2012; Fabani et al, 2013; Huang et al, 2017) But lately, advanced analysis methods have used, such as the use of electronic tongues (Cetó et al, 2012) and

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chemical sensors (Gallagher et al, 2012). Various statistical analysis methods were used to characterize the wine, such as the analysis of elementary compounds in wine by PCA, the discriminant linear analysis (LDA) and the analysis of groups of elements (HCA). (Arvanitoyannis et al, 1999).

The important factors in the production and marketing of wine are authenticity and geographical origin. Various advanced analysis methods to identify the geographical origin of the wine were used, such as atomic absorption spectroscopy (AAS) or inductively coupled plasma mass spectrometry (ICP-MS) (Almeida & Vasconcelos, 2003; Goamez et al, 2004; Coetzee et al, 2005; Geana et al, 2013).

Environmental, soil and climate factors are important in characterizing grape varieties and wines in terms of quality, quantity and flavor. (Bora, 2015). Environmental factors are the region, pedology, climate, soil type and composition (Kostic et al, 2010; Fiket et al, 2011; Huzum et al, 2012). Production factors, including: fertilizer and pesticide use, industrial pollution, wine transport and storage are anthropogenic factors leading to the pollution of vineyards (Tariba et al, 2011; Bora et al, 2015).

At present, vineyards are contaminated and still polluted, so that the heavy metal content of vineyards soils can lead to serious problems in plant productivity, food quality and endanger human health (Bora et al, 2015; Zava et al, 2020). Certain metals such as Fe, Cu and Zn are essential in the biological development of plants and other metals are extremely toxic even if they are in small quantities, such as Pb, As, Ni, Cr, Hg, V, Co, Mo and Cd (Gogoasă et al, 2005; Tuzen, 2007; Geană et al, 2013).

For the origin of wines the most researched and determined heavy metals are: Fe, Rb, Cu, Cr, Co, Sb, Cs, As, Ag, Li, Sr, Al and Mn (Fiket et al, 2011; Geană et al, 2013; Bora et al, 2015). In Romania according to this research the most important heavy metals used to determine the geographical origin of wines are Mn and Sr (Geană et al, 2013). In this work an investigation of heavy metal content profile (Cr, Ni, Cu, As, Pb, Hg, V, Sr, Mn, Zn and Fe) of soil from four important Romanian vineyards and some wine brands of Muntenia (Stefanesti wine-growing area), Dobrogea (Babadag vineyard), Transilvania (Blaj wine-growing area) and Moldova (Iasi wine-growing area) regions is performed in an attempt to achieve an overview on the heavy metals profile and to differentiate wines by regions. For the classification of wines according to geographical origin, a multiple items analysis was applied in combination with statistical modelling of multi-output data.

II. MATERIALS AND METHODS

The study is carried out in four different geographical locations in Romania, on ten assortments of wine (Chardonnay and Fetească Neagră from Babadag vineyard - Dobrogea region; Fetească Albă and Cabernet Sauvignon from Iasi wine-growing area - Moldova region; Muscat Ottonel and Traminer Roz from Blaj wine-growing area - Transilvania region; respectively Fetească Albă, Riesling Italian, Fetească Regală, and Burgund from – and Stefanesti wine-growing area - Muntenia region) from the harvest of 2019. The coordinates for each studied geographical area are: wine centre Iasi - 47°12'42,5"N, 27°31'47,1"E, 120 m altitude, East exposure, the European road E 85 passes through county, at 12 km from the wine-growing area; Blaj wine-growing area - 46°18'51,2"N, 23°92'40,5"E, 278 m altitude, East exposure, the European road E 81 and highway A10 passes through county, at 23 km from the wine-growing area; Ștefănești wine-growing area - 44°51'N si 24°57' E, altitude 250 m, South exposure, the highway A1 passes through county, at 5 km from wine-growing area, and Babadag vineyard - 44°53'36"N 28°42'43"E, altitude 250 m, east exposure the European road E 87 passes through county, at 5 km from the vineyard (Figure 1).

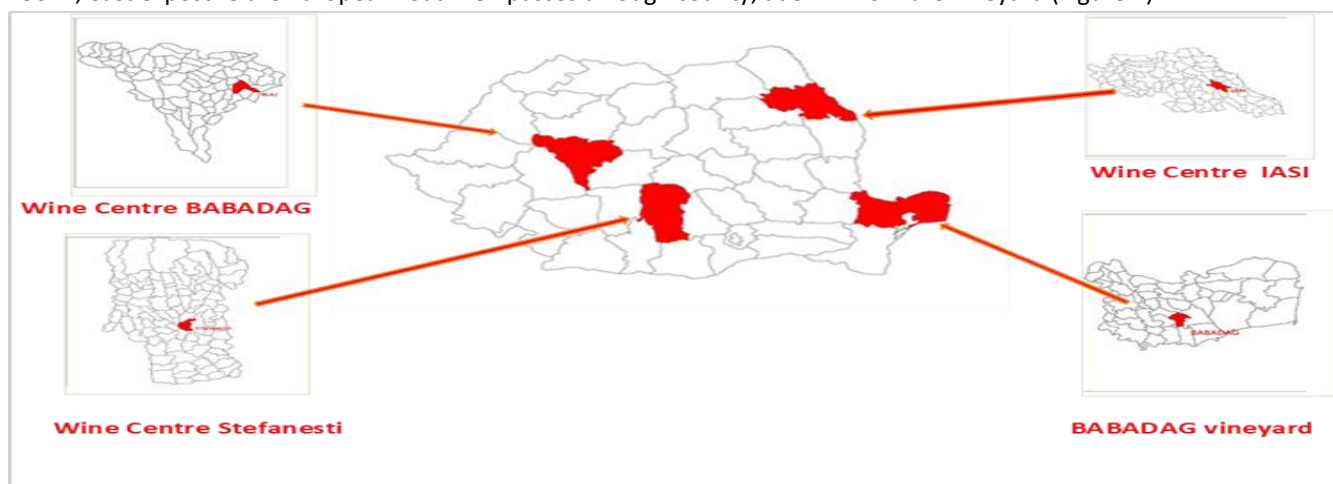


Figure 1 .Location of the study areas for the analyzed wines

The characteristics of soils in the areas studied are: Iasi wine-growing area have salnic cernoziom soil, wine Blaj wine-growing area have soil with clay and with sarmatian marl content and Babadag vineyard have sand - clay medium clay, yellowish brown

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soil. The soil in Ștefănești wine-growing centre is of the class umbrisoils of eutricambosoil type, brown, typical eumezobasic with clay in situ; the texture of the soil is clay-sandy, clay-clay, without skeleton, and the soil tillage is done with plows, the mechanical presses at intervals, the manual hoeing in a row (Toti, 2017). In 2019, during the growing season temperatures were specific to the areas studied, a longer autumn and spring was observed. In these area autumn and winter is dry, while during winter quite high temperature were registered in recent years.

Prior to analyses by ICP-MS, the wine samples have to be carefully decomposed. The amount of 1.0 g of wine was digested using A closed iPrep vessels speed iwaveJ system MARS6 CEM One Touch (CEM Corporation, Matthews, North Carolina, USA) with concentrated acid (10 ml of HNO₃ 69%) according to a 2 steps temperature-controlled digestion program. Each resulted clear aliquot of the digest were quantitatively transferred to 25 ml volumetric flasks and filled to volume with ultrapure water.

For soils, an amount of 0.5 g was digested using the same closed iPrep vessels speed iwaveJ system MARS6 CEM One Touch (CEM Corporation, Matthews, North Carolina, USA) with the mixture of concentrated acids (10 ml of HNO₃ 69% + 1ml HCl 37%) according to a 2 steps temperature-controlled digestion program. The resulted sediment digests were quantitatively transferred to 50 ml volumetric flasks and filled to volume with ultrapure water.

Analytical determinations of elements Cr, Ni, Cu, As, Pb, Hg, V, Sr, Mn, Zn and Fe were performed using an inductively coupled plasma mass spectrometer ICP-QMS 820-MS (Varian, Melbourne, Australia) equipped with an SPS-3 autosampler (Varian, Malgrave, Australia) and collision-reaction interface iCRI working in H₂ and He modes. The optimal conditions were as follows: RF power of 1200 W, plasma gas-flow rate of 12 L/min, auxiliary gas-flow rate of 1.5 L/min, nebulizer gas-flow rate of 1.05 L/min, H₂ gas flow rate of 90 mL/min, He gas flow of 90 mL/min and a dwell time of 50 ms for each isotope and ²⁰⁹Bi, ⁶Li, ⁴⁵Sc, ¹⁵⁹Tb, ⁸⁹Y isotopes that served as internal standards. Blank samples were also prepared by following the analytical methodology mentioned above. These solutions were analysed by ICP-MS after appropriate dilution using external standards for calibration, considering five points on the curve and one for quality control. Calibration standard solutions and internal standards were prepared by successive dilution of a high purity ICP multi-element calibration standard (10 µg/L from twenty-nine elemental ICP-MS standards, matrix: 5% HNO₃, Perkin Elmer Life and Analytical Sciences) and a mono-elemental calibration standard (10 µg/L Hg, matrix 5% HNO₃, Perkin Elmer Life and Analytical Sciences).

Concentration of the compounds was evaluated by statistical methods. Authentication of the geographical origin of wines using multi-element analyses with multivariate was evaluated by statistical modelling. For the statistical interpretation of the results, the data were included in an Excel database and then statistically interpreted with the SPSS 14.0 program, and the comparison of means was performed with the Duncan's multiple range test at 5% statistical assurance. The assessment of the degree of contamination / pollution of the soil-plant system, the results obtained were compared with the reference values provided by Order no. 756/1997 of the Minister of Waters, Forests and Environmental Protection, in the case of soil, and the values obtained in the case of wine analysis were reported to the Law on Vine and Wine but also to the regulations stipulated in O.I.V.

III. RESULTS AND DISCUSSION

Quantitative determinations for soil samples were made for 9 micro-elements Cr, Ni, Cu, As, Pb, Hg, V, Ag, Sr and 3 macro-elements Mn, Zn, Fe. Comparison of the Cr, Cu, and As level in the studied soils was performed with the Duncan's multiple range test at significance level $\alpha = 0.05$ ($P \leq 0.05$). There is a rather large difference in the soil from Iasi wine-growing area versus the other regions as concern the Cu (135,455 mg/kg), but also for Cr (34,002). Equally high values are found on the soil of Ștefănești wine-growing area for the Cr metal (48,343). The lowest values of these metals are found on the soil of Babadag vineyard. In table 1 can be seen that the values of the analyzed indicators are very different from one region to another and different statistically significantly for an insurance level of 5%. The distribution of copper from the analyzed soils is differentiated, namely: the soil from Ștefănești vineyard (5,430 mg/kg) recorded the highest concentrations, at the opposite pole with the lowest concentrations were recorded in the soils of Iasi Vineyard, the differences between them being statistically assured. The variation range of the As concentration in the soils was between the maximum value of 0.888 mg/kg registered in the soils from Ștefănești, followed by 0.608 mg/kg - the soils from Blaj, 0.453 mg/kg - the soils from the Iasi area, and 0.028 mg/kg in Babadag soils, the differences between them being significant for an insurance level of 5%.

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Table 1. The Level of Cr, Cu, As Elements in the Soils Studied

Soil	Cr mg/kg	5% least significant difference	Cu mg/kg	5% least significant difference	As m/kg	5% least significant difference
Sol Stefanesti	48.343 a	1.000	5.430 b	1.000	0.888 a	1.000
Soil Babadag	0.148 d	1.000	0.120 d	1.000	0.028 d	1.000
Soil Blaj	14.447 c	1.000	3.578 c	1.000	0.608 b	1.000
Soil Iasi	34.002 b	1.000	135.455 a	1.000	0.453 c	1.000

*Values with different letters are statistically different at 5% probability, Duncan test

In table 2 analyses the V, Sr and Pb elements using Duncan's multiple range test. Is observed a very high value in the content of Pb in the soil of the wine centre Blaj (19,76 mg/kg), the other wine-growing centers have a lower content of Pb in the soil, the differences between the values being statistically assured. According to the analysed data the Sr content of the soil has values close in the Stefanesti and Iasi wine-growing area (with values between 30-34,636 mg/kg), but statistically different. The lowest value is found to Babadag vineyard (0,089mg/kg), followed by the wine centre Blaj (15,276 mg/kg).

The highest content of V in the soil was registered at the wine centre Ștefănești (53,491mg/kg) and the lowest in the soil of Babadag wine growing area (0,178 mg/kg).

Table 2. THE LEVEL OF V, SR AND PB ELEMENTS IN THE SOILS STUDIED

Soil	V mg/kg	5% least significant difference	Sr mg/kg	5% least significant difference	Pb m/kg	5% least significant difference
Sol Stefanesti	53.491 a	1.000	34.636 a	1.000	4.655 c	0.058
Soil Babadag	0.178 d	1.000	0.089 d	1.000	4.367 c	0.058
Soil Blaj	18.816 c	1.000	15.276 c	1.000	19.760 a	1.000
Soil Iasi	37.509 b	1.000	30.627 b	1.000	5.073 b	1.000

*Values with different letters are statistically different at 5% probability, Duncan test

In Table 3 showed although the values of Hg content in the soil are close, but differences between them are statistically significant within the geographical areas studied, the highest value being in the Blaj region. (0,052 mg/kg Hg) and the lowest values were highlighted in the soils of Babadag and Ștefănești (0,043 mg/kg, 0,045 mg/kg Hg, respectively). In the case of Ni, the lowest value is found on the soil from Babadag vineyard (0,046 mg/kg), and the highest were highlighted in Stefanesti and Blaj wine-growing area (3,561mg/kg, 3,565 mg/kg respectively, table 3), the differences between them being statistically assured. Comparing the nickel concentration to the national legislation in force, it can be seen that it is within the normal permissible limits (20 mg / kg), and it is not possible to speak in the case of these vineyards as being polluted with Ni (Bora, 2019).

Table 3. THE LEVEL OF HG AND NI METALS IN THE SOILS STUDIED

Soil	Hg mg/mg	5% least significant difference	Ni mg/kg	5% least significant difference
Soil Stefanesti	0.045 c	0.497	3.561 a	0.221
Soil Babadag	0.043 c	0.497	0.046 c	1.000
Soil Blaj	0.052 a	1.000	3.565 a	0.221
Soil Iasi	0.046 b	1.000	3.286 b	1.000

*Values with different letters are statistically different at 5% probability, Duncan test

In the case of Zn and Mn content in the soil, their values are very small for all areas studied and differ statistically significantly between each studied geographic area. As far as Fe is concerned, the lowest content is found in the soil of Babadag vineyard, and the highest content was highlighted in the Blaj vineyard, the differences between them being statistically insured (Table 4).

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Approximate values of Fe content in the soil were recorded in the Babadag and Iasi wine-growing area, including in the same class of statistical homogeneity for an insurance level of 5% (13,918 mg/kg, respectively 13,605 mg/kg).

Table 4. THE LEVEL OF FE, MN AND ZN METALS IN THE SOILS STUDIED

Soil	Fe mg/kg	5% least significant difference	Mn mg/kg	5% least significant difference	Zn mg/kg	5% least significant difference
Soil Stefanesti	3.968 c	0.222	546.810 a	1.000	397.500 a	1.000
Soil Babadag	13.918 b	1.000	489.520 b	1.000	333.600 b	1.000
Soil Blaj	14.552 a	1.000	450.670 c	1.000	305.800 c	1.000
Soil Iasi	13.605 b	0.222	407.530 d	1.000	299.900 d	1.000

*Values with different letters are statistically different at 5% probability, Duncan test

In table 5 is expressed the content of Cr, Cu and As elements from 10 wine varieties, of the four geographic areas subject to the study. The highest Cr content meets in the Chardonnay wine in Babadag vineyard, and the smallest concentrations in red wine varieties in Iasi and Stefanesti wine-region (Cabernet Sauvignon – 13,15 µg/l and Burgund - 15,88 µg/l).

The content of wine may also depend on the treatments given to vines (Ivanova et al., 2013, Bora et al., 2015). The highest value of the contents meets at the Feteasca Neagra from Babadag vineyard (454,895 µg/l) and the smallest content in Feteasca Alba wine from Stefanesti vineyard (8,635 µg/l). In the case of As content, the highest values, but which do not differ statistically significantly, were highlighted in the Feteasca Regala and Riesling wines, both from the Ștefănești region. All other wines have registered lower values regardless of the wine-region (Table 5).

Table 5. THE LEVEL OF CR, CU AND AS METALS IN THE WINES ANALYZED

Wine names	Cr µg/L	5% least significant difference	Cu µg/L	5% least significant difference	As µg/L	5% least significant difference
Chardonnay, Babadag	270.610 a	0.073	120.345 cd	0.156	1.808 c	0.163
Feteasca Neagra, Babadag	151.170 c	0.067	454.895 a	1.000	2.394 bc	0.360
Feteasca Alba, Iasi	192.885 ab	0.147	283.110 bc	0.253	2.488 bc	0.360
Cabernet Sauvignon, Iasi	13.510 e	0.067	60.125 ef	0.133	2.544 bc	0.360
Muscat ottonel, Blaj	267.780 ab	0.153	123.775 cd	0.156	1.506 c	0.163
Traminer roz, Blaj	50.370 d	1.000	405.945 ab	0.177	1.046 d	1.000
Feteasca Alba, Stefanesti	175.400 bc	0.147	8.635 f	1.000	4.312 b	0.197
Burgud, Stefanesti	15.880 e	0.067	53.395 e	0.133	3.750 b	0.197
Riesling, Stefanesti	187.665 bc	0.147	312.650 b	0.191	7.674 a	0.433
Feteasca Regala, Stefanesti	19.855 e	0.067	109.119 cd	0.156	8.540 a	0.433

*Values with different letters are statistically different at 5% probability, Duncan test

In table 6, the V element is distinguished by a very high concentration in white wine varieties in Ștefănești (Riesling - 468,864 µg/l and Feteasca Regala - 464.79 µg/l), the other wines fall between values 23,38 µg/l Burgund from Stefanesti wine center and 43.58 µg/l for Feteasca Alba variety from Iasi wine-center. The Sr content of the analysed wines is among the only element that determines the geographical origin of wines. The largest concentration is at the wine of Feteasca Regala from Iasi wine-center and the lowest concentration of Riesling wine from Ștefănești wine-center, expressed for white wines; in red wines, the highest concentration of Sr is located at the Feteasca Regala from Babadag vineyard and the lowest in Cabernet Sauvignon wine from the Iasi region.

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Table 6. THE LEVEL OF V, SR AND PB METALS IN THE WINES ANALYSED

Wine names	V µg/L	5% least significant t	Sr µg/L	5% least significant t	Pb µg/L	5% least significant difference
Chardonnay, Babadag	28.646 c	0.849	367.0 d	0.283	9.980 d	0.650
Feteasca Neagra, Babadag	28.78 c	0.849	678.1 bc	0.167	24.990 abc	1.470
Feteasca Alba, Iasi	43.58 b	0.058	993.3 a	0.052	37.770 a	0.195
Cabernet Sauvignon, Iasi	26.440 c	0.849	352.1 e	1.000	21.540 de	0.235
Muscat ottonel, Blaj	28.020 c	0.849	887.9 a	0.052	10.540 ef	0.230
Traminer roz, Blaj	23.244 c	0.849	430.6 d	0.238	28.580 ab	0.280
Feteasca Alba, Stefanesti	31.284 bc	0.220	379.8 d	0.283	4.055 g	1.000
Burgud, Stefanesti	23.38 c	0.058	604.3 bc	0.450	24.665 de	0.235
Riesling, Stefanesti	468.864 a	0.162	801.2 ab	0.143	28.150 bc	0.162
Feteasca Regala, Stefanesti	464.79 a	0.162	579.6 cd	0.359	24.556 de	0.235

*Values with different letters are statistically different at 5% probability, Duncan test

The Pb content of wines depends on the geographical area, pollution on national roads and highways near vineyards and also by the industrial areas in the vicinity of the studied vineyards (Ivanova et al., 2013; Bora et al., 2015). The highest value of the Pb content meets in Feteasca Alba wine from Iasi region (37,77 µg/l) and the lowest values in Chardonnay wine (9,98 µg/l) of Babadag vineyard and Feteasca Alba wine (4,055 µg/l) from the Stefanesti region. Based on the applied statistical analyzes, it can be seen that there are very significant differences between the analyzed variants (Table 6).

The Hg content of the wine is given by the diffuse, natural movement of the traces of metal elements in the soil (Catarino et al., 2006; Ivanova et al., 2013; Gheșeș et al., 2013; Bora et al., 2015; Zava and Cone., 2015; 2020), (Table 7). The Ni content of the wine is given the "natural" mineral content of the soil and the ability of vines to absorb and accumulate these elements in grape grains, products used in the agricultural practice or winemaking treatments. (Alkis Mert et al, 2014; Bora et al, 2015). The highest content in the element is found in Chardonnay wine (298,945 µg/l) of Babadag vineyard and the lowest in Feteasca Alba (3,465 µg/l) from Ștefănești wine-center the differences between them being statistically assured (table 7).

Table 7. THE LEVEL OF HG AND NI METALS IN THE WINES ANALYSED

Wine names	Hg µg/L	5% least significant difference	Ni µg/L	5% least significant difference
Chardonnay, Babadag	7.445 a	1.000	298.945 a	1.000
Feteasca Neagra, Babadag	5.580 b	0.133	40.505 c	0.303
Feteasca Alba, Iasi	5.335 bc	0.217	123.255 b	0.203
Cabernet Sauvignon, Iasi	4.920 bc	0.271	46.115 cd	0.149
Muscat ottonel, Blaj	4.490 cd	0.178	104.515 bc	0.267
Traminer roz, Blaj	4.690 bc	0.217	67.915 bc	0.267
Feteasca Alba, Stefanesti	4.430 d	0.083	3.465 f	0.344
Burgud, Stefanesti	4.430 d	0.083	7.405 ef	0.429
Riesling, Stefanesti	4.375 d	0.083	12.120 e	0.512
Feteasca Regala, Stefanesti	4.350 d	0.083	29.950 d	0.512

*Values with different letters are statistically different at 5% probability, Duncan test

The content of Fe in wine is given by wine production technology and the treatments given to vines (Jakubowski et al, 1999; di Paola-Naranjo et al, 2011; Grindlaya et al, 2011; Bora et al, 2015). The wine with the highest concentration of Fe is in Muscat Ottonel wine (12.309 mg / l) from the Blaj vineyard. According to the analysed data, the Mn content is given by the natural concentration in soil, and Zn content is given by the industrial area in the vicinity of the studied vineyards Table 8. The highest Zn content it is in Muscat Ottonel wine (10,041 mg/l) from Blaj wine region and the smallest concentration from Ștefănești wine-center in Fetească Regala wine (2,182 mg/l).

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Table 8. THE LEVEL OF HG AND NI METALS IN THE WINES ANALYSED

Wine names	Fe mg/L	5% least significant difference	Mn mg/L	5% least significant difference	Zn mg/L	5% least significant difference
Chardonnay, Babadag	0.794 e	0.468	1.006 b	0.072	5.960 d	1.000
Feteasca Neagra, Babadag	1.380 de	0.085	0.934 c	0.134	7.622 b	0.120
Feteasca Alba, Iasi	3.144 c	0.345	0.668 d	1.000	7.943 b	0.120
Cabernet Sauvignon, Iasi	0.550 e	0.468	1.288 ab	0.394	2.633 f	0.963
Muscat ottonel, Blaj	12.309 a	0.205	1.288 ab	0.394	10.041 a	1.000
Traminer roz, Blaj	6.633 b	1.000	1.346 a	0.322	7.030 c	1.000
Feteasca Alba, Stefanesti	1.39 de	0.085	1.064 b	0.072	3.722 e	0.083
Burgud, Stefanesti	0.36 cd	0.345	1.270 ab	0.394	2.642 f	0.963
Riesling, Stefanesti	0.202 f	0.205	1.206 b	0.072	3.362 e	0.083
Feteasca Regala, Stefanesti	0.288 f	0.205	0.914 c	0.134	2.182 g	1.000

*Values with different letters are statistically different at 5% probability, Duncan test

Heavy wine metals are expressed in $\mu\text{g/l}$, except for Fe, Mn and Zn, expressed in mg/l (Figure 2).

For the latter, along with the calculated value, we have the standard error, which gives us the degree of inaccuracies (error) to the two indicators, in relation to their real values, at the level of the population at which the analysed data is assumed to be extracted. The comparative boxplot representations of Figure 2 make the relationships between the distributions analysed, reporting simultaneously at the same reference value (Figure 2) and the values of heavy metals concentrations in the analysed wines.

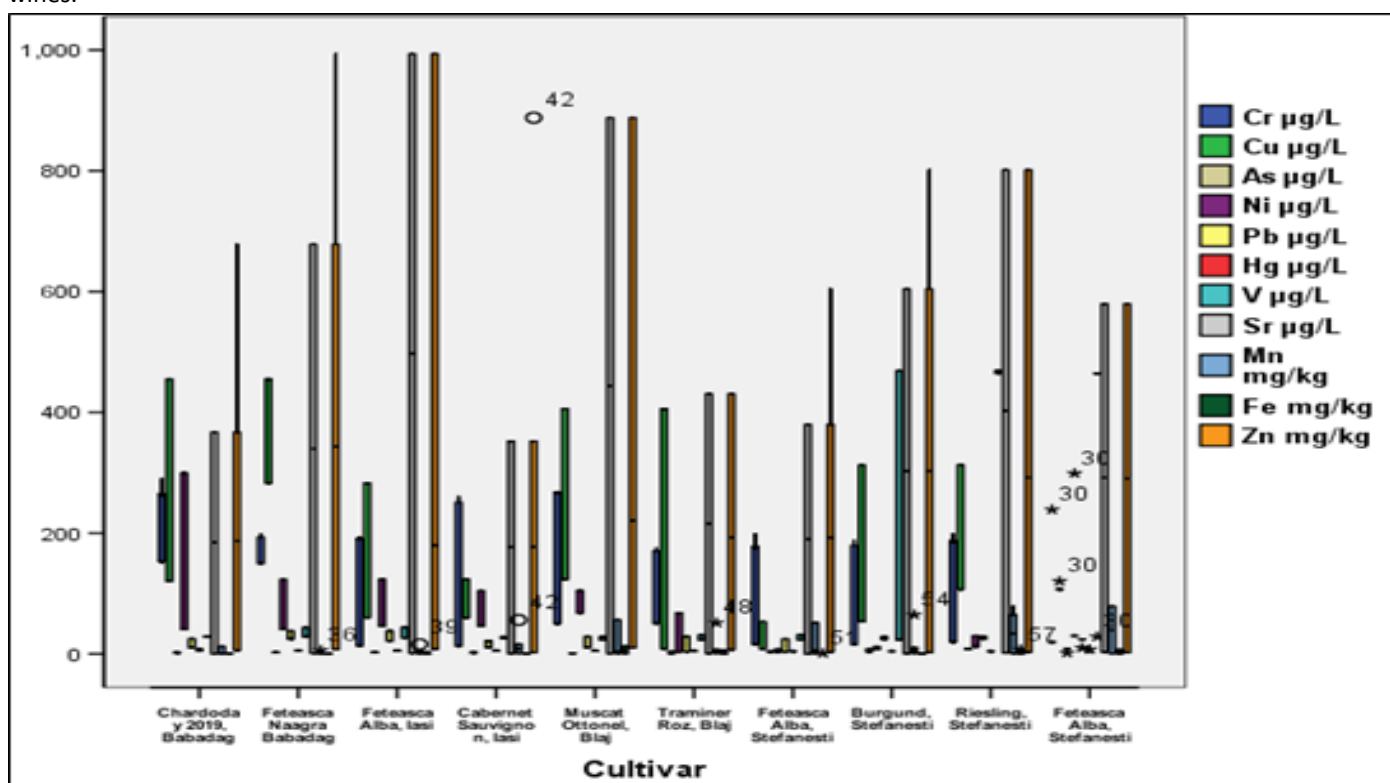


Figure 2. Heavy metals in wine

For the latter, along with the calculated value, we have the standard error, which gives us the degree of inaccuracies (error) to the two indicators, in relation to their real values, at the level of the population at which the analysed data is assumed to be extracted. The comparative boxplot representations of Figure 2 make the relationships between the distributions analysed, reporting simultaneously at the same reference value (Figure 2) and the values of heavy metals concentrations in the analysed wines.

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Table 9. Results of Statistical Test to Check Normality for the Metals Analysed and the Gradations of the Wine Factor

	Kolmogorov-Smirnov(a)			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Cr µg/L	.209	60	.000	.854	60	.000
Cu µg/L	.276	60	.000	.860	60	.000
As µg/L	.262	60	.000	.806	60	.000
Ni µg/L	.229	60	.000	.721	60	.000
Pb µg/L	.231	60	.000	.888	60	.000
Hg µg/L	.239	60	.000	.701	60	.000
V µg/L	.454	60	.000	.531	60	.000
Sr µg/L	.310	60	.000	.804	60	.000
Mn mg/kg	.304	60	.000	.647	60	.000
Fe mg/kg	.368	60	.000	.629	60	.000
Zn mg/kg	.309	60	.000	.807	60	.000

In table 9, it is presented the results of statistical tests for normalization from the analysed metals and wine factor grades. Essentially, they test the degree of overlapping between the cumulative distribution of the variable analysed and the cumulative distribution of a variable whose distribution follows the Gaussian form.

Table 10 shows the statistical indicators of the central trend and distribution of the values of the indicators analysed for the 10 wines subjected to the tests throughout the sample: N (number of measured values and missing values); The minimum and maximum sample value, the maximum, medium, median and mode, standard deviation and asymmetry values and vault indicators (excess). For the latter, along with the calculated value, we have the standard error, which gives us the degree of inaccuracies (error) to the two indicators concerning their real values, at the level of the population at which the analysed data is assumed, is extracted. In our case, we notice that the normality test has P (sig.) Higher than 0.05 for the "heavy metal" variables, which confirms the normality hypothesis. The comparative boxplot representations of Figures 3 make the relations between the more expressive distributions, reported simultaneously at the same reference value (Figure 3), the values of heavy metals in the analysed wines.

Table 10. Statistical Indicators of the Central Trend and the Spread of Heavy Metal Values Analysed From Wines Studied

	Cr µg/L	Cu µg/L	As µg/L	Ni µg/L	Pb µg/L	Hg µg/L	V µg/L	Sr µg/L	Mn mg/kg	Fe mg/kg	Zn mg/kg
Mean	129.365	192.749	3.7167	68.9688	21.725	4.971	123.9709	304.311	16.9161	2.0782	309.8845
Median	152.19	122.061	2.5385	40.5075	24.624	4.715	28.7715	177.753	1.482	0.7745	181.1225
Mode	15.88(a)	53.40(a)	1.05(a)	3.47(a)	4.06(a)	4.34(a)	23.38(a)	352.15(a)	1.29	.20(a)	2.18(a)
Std. Deviation	95.8001	151.3826	2.5263	79.9539	9.7064	0.857	181.8367	343.013	25.8851	3.23609	342.9337
Skewness	0.004	0.531	0.984	1.974	-0.399	1.997	1.408	0.616	1.47	2.182	0.59
Std. Error of Skewness	0.309	0.309	0.309	0.309	0.309	0.309	0.309	0.309	0.309	0.309	0.309
Kurtosis	-1.539	-1.228	-0.492	3.466	-0.631	3.495	-0.014	-1.043	0.546	4.006	-1.094
Std. Error of Kurtosis	0.608	0.608	0.608	0.608	0.608	0.608	0.608	0.608	0.608	0.608	0.608
Range	277.09	446.27	7.51	297.49	33.71	3.11	445.63	993.22	78.33	12.63	991.11
Minimum	12.26	8.63	1.04	3.46	4.05	4.34	23.24	0.07	0.67	0.02	2.18
Maximum	289.35	454.9	8.55	300.95	37.76	7.45	468.87	993.29	79	12.65	993.29

In Table 11, the correlations between the indicators studied in wine show which we highlight below: it is noted that Cr element correlates positively with the elements: Cu, Sr, Mn and Zn ($r=0.12$, $r=0.062$, $r=0.003$, $r=0.099$), distinctly significantly positive with the elements Ni, Hg ($r=0.552^{**}$, $r=0.499^{**}$) and negative correlation with V, Fe ($r=-0.165$, $r=-0.054$), significantly negative with As ($r=-0.265^{*}$) and distinctly significantly negative with Pb element ($r=-0.378^{**}$), which explains that there is a balanced ratio between these indicators (Grindlay et al, 2009; Woldemariam, 2011; Bora et al, 2015; Zava et al, 2020).

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The Hg element was correlated positively with Cu and Sr ($r=0.144$, $r=0.003$), distinctly positive with Ni and Cr ($r=0.902^{**}$, $r=0.499^{**}$), and on the other hand negative correlation with Pb, Zn and Fe ($r=-0.173$, $r=-0.208$, $r=-0.084$), distinctly significant and significantly negative correlations with As, V and Mn ($r=-0.475^{**}$, $r=-0.372^{**}$, $r=-0.298^{*}$). The Sr element is positively correlated with the elements: Cr, Ni, Cu, Pb, Hg, V ($r=0.065$, $r=0.034$, $r=0.083$, $r=0.124$, $r=0.003$, $r=0.031$), significantly positive with the Fe element ($r=0.325^{*}$) and distinctly significant negative correlated with Mn and Zn ($r=-0.549^{**}$, $r=-0.797^{**}$).

Table 11. Correlations between the Elements Studied In Wine Cultivars

		Cr µg/L	Ni µg/L	Cu µg/L	As µg/L	Pb µg/L	Hg µg/L	V µg/L	Sr µg/L	Mn mg/kg	Fe mg/kg	Zn mg/kg
Cr µg/L	Pearson Correlation	1	.552(**)	0.12	-.265(*)	-.378(**)	.499(**)	-0.165	0.062	0.003	-0.054	0.099
	Sig. (2-tailed)		0	0.362	0.041	0.003	0	0.207	0.638	0.984	0.683	0.449
Ni µg/L	Pearson Correlation	.552(**)	1	0.014	-.468(**)	-0.183	.902(**)	-.307(*)	0.034	-0.197	-0.062	-0.043
	Sig. (2-tailed)	0		0.917	0	0.162	0	0.017	0.797	0.131	0.636	0.745
Cu µg/L	Pearson Correlation	0.12	0.014	1	-0.193	.595(**)	0.144	0.037	0.083	-0.211	-0.024	0.109
	Sig. (2-tailed)	0.362	0.917		0.14	0	0.273	0.781	0.527	0.105	0.856	0.409
As µg/L	Pearson Correlation	-.265(*)	-.468(**)	-0.193	1	0.134	-.475(**)	.928(**)	-0.008	.470(**)	0.013	0.057
	Sig. (2-tailed)	0.041	0	0.14		0.308	0	0	0.951	0	0.923	0.665
Pb µg/L	Pearson Correlation	-.378(**)	-0.183	.595(**)	0.134	1	-0.173	.255(*)	0.124	-0.152	-0.073	0.162
	Sig. (2-tailed)	0.003	0.162	0	0.308		0.187	0.05	0.345	0.247	0.578	0.215
Hg µg/L	Pearson Correlation	.499(**)	.902(**)	0.144	-.475(**)	-0.173	1	-.372(**)	0.003	-.298(*)	-0.208	-0.084
	Sig. (2-tailed)	0	0	0.273	0	0.187		0.003	0.981	0.021	0.111	0.525
V µg/L	Pearson Correlation	-0.165	-.307(*)	0.037	.928(**)	.255(*)	-.372(**)	1	0.031	.467(**)	0.067	0.09
	Sig. (2-tailed)	0.207	0.017	0.781	0	0.05	0.003		0.813	0	0.609	0.493
Sr µg/L	Pearson Correlation	0.062	0.034	0.083	-0.008	0.124	0.003	0.031	1	-.549(**)	.325(*)	-.797(**)
	Sig. (2-tailed)	0.638	0.797	0.527	0.951	0.345	0.981	0.813		0	0.011	0
Mn mg/kg	Pearson Correlation	0.003	-0.197	-0.211	.470(**)	-0.152	-.298(*)	.467(**)	-.549(**)	1	0.16	.589(**)
	Sig. (2-tailed)	0.984	0.131	0.105	0	0.247	0.021	0	0		0.223	0
Fe mg/kg	Pearson Correlation	-0.054	-0.062	-0.024	0.013	-0.073	-0.208	0.067	.325(*)	0.16	1	-0.198
	Sig. (2-tailed)	0.683	0.636	0.856	0.923	0.578	0.111	0.609	0.011	0.223		0.13
Zn mg/kg	Pearson Correlation	0.099	-0.043	0.109	0.057	0.162	-0.084	0.09	-.797(**)	.589(**)	-0.198	1
	Sig. (2-tailed)	0.449	0.745	0.409	0.665	0.215	0.525	0.493	0	0	0.13	

IV. CONCLUSIONS

Intensive wine production from Iasi viticulture area had like results an increase of Cu content in the soil, about tens of times larger (135,455 µg/kg) as compared to the other wine-producing geographical areas (Babadag vineyard – 0,120 µg/l), due to cultural practice on the ancestors of wine production and regarding the long term of treatments application with copper products.

The high concentration of Pb in soil (19,76 mg/kg), it is from Blaj geographic area, due to the pollution from the industry in the area and proximity to the A10 highway; this leads to a Pb content of the wine to being larger (Fetească Neagră - 24,99µ l); but the highest value is found in wine from Iasi viticulture region (Fetească Albă – 37,76 µg/l), although the Pb content in soil is lower there (5,073 mg/kg), due to the treatments performed on vines it is higher in wine. However, the other concentrations of

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toxic metal lead in wines were found in the range of 0,02-37,76µg/l; These values are quite low compared to the set limit of OIV as 0,2 mg/l.

The elements Cr, Ni, Sr, Cu, Pb, Hg and V were identified as indicators for the description of wines and soils for the four geographical areas studied. Concentration levels of all analysed elements in all examined wine samples were below the maximum contamination level established by O.I.V. regulations. In general, moderate wine consumption contributes to the daily nutritional requirements of many essential metals, including Fe, Zn, Mn, and Cu. The elements As, V, Pb, Hg, Cr, Ni, Mn, Zn were found to have a significant mutual correlation in analysed wines. They were also found to differ between the four wine-growing regions investigated. Since Sr, Hg, Mn are typical geological elements, their presence in wine is normally considered to reflect regional soil chemistry. The association of Pb and As with geological elements involves a predominant feature. In general, the values found are in line with the data previously reported on wines from another bibliographic source, a natural condition for these elements.

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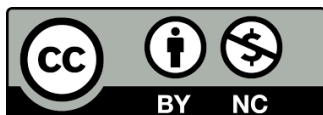
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Outstanding Manuscripts of The “Bukhara Collection” of The Institute of Oriental Manuscripts of The Russian Academy of Sciences (St. Petersburg)



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ABSTRACT: Outstanding manuscripts created on the territory of Uzbekistan in ancient, powerful states - in Khorasan and Maverannakhr, represent a fund of priceless manuscripts and folios in the Institute of Foreign Affairs of the Russian Academy of Sciences, among which there are genuine unique ones. They were acquired by the institute and thanks to scientific missions of the institute's employees, starting from the end of the 19th century. One of the most valuable collections is the Bukhara Collection by Vladimir Ivanov. About some unique folios acquired by the St. Petersburg scholar in Bukhara, and will be discussed in this story.

KEY WORDS: Bukhara, collection, manuscripts, scientific works, works of art, Sufism, archaeography.

INTRODUCTION

The emergence of the first Central Asian collections in Russia is closely connected with the history of Oriental studies. Oriental studies, as a science, was necessary, first of all, for the development of Russian statehood, constant interaction with the peoples that were part of the Russian Empire, had their own culture and professed different religions. After all, most of the territory of this power is in Asia. In addition, infinitely long lines of borders with the countries of the East, trade and diplomatic relations required people who knew the East.

THE MAIN RESULTS AND FINDINGS

Since the end of the 17th century in Russia, they began to purposefully collect manuscripts in Eastern languages, as well as household items and cult of the countries of the East.

The first manuscripts in Arabic script came to Russia from trips to Muslim regions. Oriental books were also acquired by private collectors in Europe.

However, from the time of the creation of the first oriental collections to the creation of a truly scientific, in fact, Russian oriental studies, almost a whole century will pass. In this regard, it is difficult to overestimate the importance of the Asian Museum, which has become a kind of bridge between East and West. At the origins of the creation of the Asian Museum were not only scientists, but also statesmen, for whom it was important that the collections, as well as sources in the languages of the East, be stored in St. Petersburg, studied and published.

The creation of the Asian Museum marked the beginning of a new period - academic oriental studies in Russia. The Asian Museum gradually became one of the world's largest collections of Oriental folios and manuscripts and the main, the earliest in Russia, institution for the fundamental scientific study of the East.

In this study, special attention is paid to the collections of manuscripts that were created in the ancient cities of Uzbekistan, but by the will of fate ended up in St. Petersburg in the Asian Museum, the successor of which was the Institute of Oriental Manuscripts of the Russian Academy of Sciences, where the manuscript masterpieces of the Muslim collection are currently stored.

In 1912, the Muslim fund of the Asian Museum received a unique list of the famous work of the great oriental scholar-encyclopedist Abu Rayhan Biruni (Abu Rayhan Muhammad ibn Ahmed al-Biruni, 973-1048) - the manuscript "Kitab Al-osor al-

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bokiya an al-kurun al -cholia” (“Monuments of past generations”). The list, which entered the Asiatic Museum, was rewritten almost 200 years after the scientist's death in 1220-1221. Science does not know the source of the manuscript in the Asian Museum. In Europe, this work of Biruni is known under the name "Chronology", and in the East - "Osor al-boqia". The historical work, in the center of which is the genealogy and chronology of the largest dynasties of the Near and Middle East, was created by the scientist in 1000, when he was 27 years old. The manuscript includes the calendar systems of many peoples and chronological tables of historical events. In addition, this fundamental work is devoted to the history and culture of Khorezm and neighboring states of the East.

The Muslim fund of the Institute of Oriental Manuscripts of the Russian Academy of Sciences was replenished thanks to the expeditions of the Institute to Central Asia. The first of them took place at the suggestion of Vasily Bartold (1869-1930) in 1914 in the Turkestan region "to search for and acquire Muslim manuscripts". And already in the next year, in 1915, an individual archaeographic expedition was undertaken to Bukhara by an orientalist linguist, poet and translator, Vladimir Ivanov (1886-1970). Since 1915, the scientist worked as a junior curator of the Asiatic Museum. More than one thousand, or rather 1057 manuscripts were bought by him in Bukhara and delivered to the Asian Museum. This is the so-called Bukhara collection. It is a collection of priceless Muslim manuscripts reflecting the intellectual life of not only Bukhara, but the entire Maverannahr for several centuries. These are works on theology, history, geography and outstanding works of fiction and poetry of the East. The manuscripts were rewritten several times. For example, in the Emirate of Bukhara, permission to make copies of the manuscript and its authenticity was confirmed by the imam of Bukhara. After a complete comparison of the manuscript with the existing original, the imam, in the presence of witnesses, issued a document confirming the correctness of the copy, and sealed it with his signature and seal. Manuscripts copied without permission were considered worthless. These facts testify to how much the manuscripts were valued and played a huge role in the cultural life of the enlightened electorate of Bukhara.

The results of the 1915 expedition were called "brilliant" in the Asian Museum. In the report of the museum for this year, the activities of Vladimir Ivanov were especially noted: “such brilliant results of the collective activity of Mr. Ivanov are due to his tireless zeal and experience in relations with Eastern booksellers, acquired during his travels ...”. Along with the replenishment of the manuscript collection, the process of its cataloging and the study of individual literary monuments was going on almost simultaneously in the Museum. The handwritten book becomes the source of the most important base for any research. The composition of the manuscripts of the Bukhara collection is diverse both in the time of their census and in the place of their origin. The earliest examples date back to the 11th century. These are comments on the Qur'an "at-Taysir fi tafsir an-Nasafi" by Najmuddin Abu Hafs Umar ibn Muhammad ibn Ahmad an-Nasafi al-Hanafi as-Samarkandi (1067-1142), a famous Islamic theologian, interpreter of the Koran, author of more than a hundred works of religious content and philosophical treatises. Ivanov's Bukhara collection contains several lists of interpretations of the Koran, among them "al-Kashshaf an haqaik at-tanzil" by the famous Khorezmian az-Zamakhshari (Abu-l-Kasim Mahmud ibn Umar al-Zamakhshari, 1074 - 1143). In addition to Koranic texts and religious works, Ivanov's collection included scientific and philosophical treatises, works of oriental poetry and artistic prose. The pearl of the collection is another work by Zamakhshari "Tahafut al-falsif" - "The overthrow of the philosophers". Among the manuscripts of the Ivanov collection was a rare copy of the dictionary of Ismail ibn Hammad al-Jawhari (940-1003) "As-Sikah fi al-lugat" ("The crown of speech and the correct words of the Arabic language"), rewritten in the 13th century, which is one of the main Arabic medieval dictionaries. The dictionary provides absolutely reliable information on the pronunciation and grammar of more than 40,000 Arabic words and expressions. In addition, the author described in detail the origin and meaning (isox) of each word included in his work. The dictionary, created by the author between the second half of the 10th century and the beginning of the 11th century, was rewritten in 1253. The list, which V. Ivanov brought to St. Petersburg, was personally sealed with the seal of the Bukhara ruler Subkhankuli Muhammad Khan (1625-1702). It can be assumed that the manuscript, copied in the middle of the 13th century, was kept in the kitabkhana of the Bukhara emirs already in the 17th century.

Of particular value to the collection are handwritten books from the library of the sheikh of the Naqshbandi Sufi brotherhood - Muhammad Pars, whose year of birth varies from 1345 to 1355 (d. 1420). “In the Bukhara collection, the main thing, if not in quantity, then in quality, the place belongs to the remains of the library of the Central Asian figure, the head of the Sufi Nakshbendi order, the second successor of Bukhaaddin an-Naqshbend - Muhammad Pars. Most of the best and most valuable manuscripts of the collection belong to this library”, we read in the study “Arabic Manuscripts” by Viktor Belyaev. In this collection, the manuscript with the work of Muhammad Pars "The Circumstances of High Mecca" was created in 1576.

Ivanov's collection also included the manuscript "Nafakat al-uns min qadarat kuts" - "Blows of friendship from the cloisters of holiness" by Abdurakhman Jami (Nuriddin Abdurrahman ibn Ahmad Jami, 1414-1492). This work includes a chronicle

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of the life of 616 sheikhs, saints and scholars who lived in the XIII-XIV centuries. In the description of the catalog of the Muslim Foundation, it is written that there are more than thirty women among them. This work was created by Jami in 1475-1477 under the influence of the works of Abdullah Ansari (1006-1088) "Tabaqat as-Sufi" and Fariddin Attara (1156-1220) "Tazkirat al-avliya", which are stored in the Muslim fund of the Institute (D330). Some sources contain information that Abdurakhman Jami created this treatise at the request of Alisher Navoi, who, in response to Jami's "Nafakat al-uns", created an anthology in the Uzbek language "Nasaim al-muhabbat", which includes stories about the life of 770 poets and saints. Jami's list from Ivanov's collection was copied in Bukhara. However, there is no exact date for the census of the manuscript. The catalog indicates a possible date starting from 1829.

The Institute of Oriental Manuscripts of the Russian Academy of Sciences has a manuscript with one of the most famous works of Abdurakhman Jami - "Yusuf and Zuleikha", which is one of the seven poems included in "Haft Avrang" - "Seven Thrones". Jami created this poem in 1483, already being a well-known poet and Sufi in the East. During his lifetime, Jami enjoyed great respect. Scientists from all over Maverannahr, India, Iran, Asia Minor and Arabia corresponded with him, and some of them came to Herat to meet him personally. His 337 autographs have been preserved in various manuscript collections of the world. Jami's list "Yusuf and Zuleikha" was rewritten in 1823. It is a unique piece of manuscript art, since from the cover to the final colophon, it is decorated with colorful miniatures corresponding to each fragment of the content. 83 years after its creation, this folio ends up in Ivanov's collection.

The pinnacle of literary creativity of Abdurakhman Jami is considered "Bakharistan" - "Spring Garden". This work in rhymed prose was created by the poet in 1482. The list from Ivanov's collection was copied in Kokand in the first half of the 19th century (1835-1836). Researchers compare Jami's "Spring Garden" with the famous work of his brilliant predecessor Saadi (Muslihiddin Abu Muhammad Abdallah ibn Mushrifaddin Shirozi, 1210-1292) - "Gulistan". Both poems have an introduction and eight chapters - "gardens" and are practically presented in a single manner. Jami's Baharistan has been translated into Latin and many European languages.

Ivanov's collection included several "Divans" (collections of poems), the greatest lyric poet of the East, Hafiz Shirazi (Shamsiddin Muhammad Hafiz Shirazi, 1326 - 1389), rewritten at different times in Bukhara. One of them, which is rightfully considered the most valuable example of the art of the Maverannakhr manuscript, was created in Bukhara in the 19th century (the exact date of the census is not available). The manuscript is richly decorated with miniatures dominating several pages and ornamented with floral designs. Despite the fact that the poet wrote only in Farsi, his works were copied throughout the East, including in the states on the territory of present-day Uzbekistan. This collection has a preface, compiled after the death of the poet, according to scientists from the Institute of Contemporary Art of the Russian Academy of Sciences (A. Khismatulin).

Each of the masterpieces of book art has its own history and destiny. It is quite obvious that they were the result of the needs of high-ranking customers and were created by outstanding masters of manuscript art.

CONCLUSION

The states that once flourished on the territory of Uzbekistan were ruled by enlightened rulers who possessed priceless collections of manuscripts and folios. Timurid Herat, Bukhara, the capitals of the great Baburids in India - they were famous for their book treasures. The illustrated manuscripts of the "Bukhara Collection" are exquisite, filled with wisdom, philosophy, legends, and exceptional intelligence of poets and thinkers who left us unforgettable images of their heroes, who continue to live in priceless manuscripts created in the royal libraries by a galaxy of talented calligraphers, miniaturists and gilders.

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The Effect of Swedish massage And Sport Massage on the Recovery of Fatigue on Labor Workers or Collectors



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ABSTRACT: This study aims to determine the effect of Swedish massage and sports massage on fatigue recovery in laborers or coolies. This study uses an experimental method with a "two group's pre-test-post-test design" design. The population in this study were coolie workers or laborers who worked for 7-8 hours every day, totalling 22 people. The sampling technique used was purposive sampling technique. Inclusion criteria for male research subjects with an age range of 25-30 years, heavy workers who use their muscles and energy to work. The instrument in this study used a job fatigue questionnaire in the form of a work fatigue questionnaire. Data analysis used t-test with a significance level of 5%. The results showed that (1) there was an effect of Swedish massage on fatigue recovery in laborers or coolies. (2) There is an effect of sport massage on fatigue recovery in laborers or coolies, amounting to. (3) Sport massage is better than Swedish massage on fatigue recovery in laborers or coolies.

KEYWORDS: swedish massage, sports massage, fatigue recovery

INTRODUCTION

Work is an activity that is carried out by every human being to earn money as a medium of exchange for fulfilling their needs (Alimuddin, 2020). The types of work carried out are various, there are those who work as office workers and as laborers. Workers often ignore various aspects that can interfere with their work, health and comfort aspects that arise as a result of work fatigue, both physically and mentally, they often ignore and only care about the rewards of the work they do.

In general, physical fatigue can appear when doing activities that exceed the capacity of their physical abilities. Work fatigue can cause physiological and psychological fatigue (Kahpi, 2020). Symptoms that arise from physiological work fatigue can be felt from the appearance of pain in the muscles, stiffness or spasms in certain parts to excessive sleepiness, discomfort and boredom, which are effects that arise from increased lactic acid as a result of the body's metabolic processes work continuously (Puspitasari, 2020). Workers or coolies in Indonesia are more often connoted as a type of work that prioritizes muscles and great energy rather than intellectual ability and expertise to do the work (Labour Union Law, 2002: 9). Working as laborers or coolies requires high energy and fitness. Laborers or coolies who work for long periods of time and prioritize their muscular ability and energy to work can experience discomfort caused by muscle fatigue, the fatigue they feel is starting to get tired, the body feels stiff and has pain, muscle cramps, sometimes the worker becomes lethargic. and decreased motivation to work.

There are many ways that can be done when experiencing fatigue and to speed up recovery after activity, one of which is the massage method. With the treatment that is often done is the Swedish massage which aims to reduce muscle tension due to activity. Muscle tension that occurs is influenced by lactic acid in the blood due to the body's process of releasing energy (Kresnawati, 2018). Swedish massage is a massage that is carried out by a massage to help speed up the recovery process by using a touch of the hand and without introducing drugs into the body which aims to relieve or reduce complaints or symptoms in several kinds of diseases which are indications for massage. The goals of hand manipulation techniques (massage) include muscle relaxation, improvement of flexibility, reduction of pain, and improvement of blood circulation (Purnomo, 2016).

sports massage is one type of massage that is used as an alternative to relieve fatigue and fatigue (Prastowo & Arovah, 2014). This is because Sport massage is designed to facilitate blood circulation, especially the encouragement of venous blood or venous blood to the heart so as to help restore and process the rest of the metabolism, in addition to providing muscle and nerve relaxation. In sports massage the mainstay of manipulation techniques are Effluerage, Petrissage, Shaking, Tapotement, Friction,

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Walken, Efflurage, Vibration. Swedih massage is a manipulation of massage movements whose movements consist of effrage, friction, petrissage, tapotement which are carried out for 45 minutes.

METHODS

This type of research is experimental. The experimental method is defined as a systematic method for building relationships that contain causal-effect relationships.(Babang et al., 2019). The design used in this study was "Two Groups Pretest-Posttest Design", namely a research design that contained a pretest before being given treatment and a posttest after being given treatment, thus it can be known more accurately, because it can be compared with those held before being given treatment.(Bagaskara & Suharjana, 2019). The place of research is in the development of the UNY park on Jalan Colombo No. 1. The population in this study are coolie workers or laborers who work for 7-8 hours every day. This study used a population of 22 people. The sampling technique used purposive sampling technique. Inclusion criteria for male research subjects with an age range of 25-30 years, heavy workers who use their muscles and energy to work. All samples were pretested using a job fatigue questionnaire, ranked by pretest scores, then matched with the ABBA pattern in two groups with 11 members each. The sampling technique used is ordinal pairing. Ordinal pairing is the division of a group into two with the aim of both having the same or equal ability(ASRUL, 2018). The research instrument used a job fatigue questionnaire in the form of a work fatigue questionnaire. This questionnaire contains 3 main components, namely (1) physical complaints (seven questions), (2) motivation disorders (one question), (3) impaired concentration (two questions). Each question has an answer in the form of strongly disagree (STS) is worth 4, disagree (TS) is worth 3, agree (S) is worth 2, strongly agree (SS) is worth 1. The largest score that can be achieved is 40 while the minimum score is 10. Grid -The instrument grid in this study is as follows:

Table 1. FATIGUE INSTRUMENT GRID

Variable	Indicator	Factor	No Item	Amount
Fatigue	Physical Complaints	Sore	1	7
		Rigid	2	
		Painful	3	
		Weak	4	
		Slow	5	
		Fit	6	
		Comfortable	7	
	Motivational Disorder	Active	8	1
	Concentration Disorder	Productive	9	2
		Decrease	10	
Amount			10	

In order to test the accuracy of the data collection instrument, before the research began, the validity and reliability of the questionnaire was tested. In the first stage, the researcher conducted the content validity of the questionnaire. Content validity was conducted to determine the extent to which the questionnaire represented all aspects considered to be the conceptual framework. The second stage is to test the questionnaire to groups that have the same characteristics as the research subjects. Questionnaire trials were conducted on 20personcoolie workers or laborers who work for 7-8 hours every day. After being analyzed with the Corrected Item Total Correlation method, which correlates the score of the question items with the total score of the questions and correlates them with the coefficient value. In addition, the reliability test using the AlphaCronbach method obtained an alpha value of 0.830 (>0.60) so that the questionnaire was declared reliable and feasible to be used as a research instrument.

The data collection process is carried out in September 2021. Data collection is carried out for 2 weeks. For the first week for the Swedish massage treatment and the second week for the sports massage treatment. The researcher gave the first questionnaire (pretest) and provided instructions and guidance so that there were no mistakes in filling out the questionnaire. The first questionnaire was filled in by the subject after carrying out activities in the form of work, then being treated with Swedish massage and sports massage after work. The second questionnaire (posttest) was given after the Swedish massage and sports massage treatment ended. Guidelines for the implementation of treatment (massage treatment) refers to the FITT (Frequency, Intensity, Time, and Type) treatment program as follows:

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Table 2. Guidelines for the Implementation of Swedish Massage and Sport Massage

No	Component	Swedish Massage	Sports Massage
1	Frequency	One time treatment	One time treatment
2	Intensity	Pressure adapt muscle size or thickness	Pressure adapt muscle size or thickness
3	time	45minute, every manipulation 3-8 time test	45 minute, every manipulation 3-8 time test
4	Type	Swedish Massage picture and order attached	Sport Massage picture and the attached order

after the data is collected, it is analyzed using SPSS 2020, before testing the hypothesis, it is necessary to test prerequisites. Testing of measurement data related to research results aims to help the analysis to be better. For this reason, this study will test the normality and homogeneity of the data. Before proceeding to the t-test, there are requirements that must be met by the researcher that the analyzed data must be normally distributed, for that it is necessary to carry out a normality test and a homogeneity test.(Wiratama & Karyono, 2017).

RESULTS

Table 3. Pretest and Posttest Results of Group Work Fatigue Swedish Massage

No Subject	Pretest	Posttest	Difference
1	39	30	9
2	38	33	5
3	38	28	10
4	37	30	7
5	37	31	6
6	34	32	2
7	34	31	3
8	32	28	4
9	31	30	1
10	31	30	1
11	31	27	4
mean	34.73	30.00	
Standard Deviation	3.17	1.79	
Minimum	31.00	27.00	
Maximum	39.00	33.00	

Based on the data in table 3 above, the distribution of work fatigue pretest and posttest for the Swedish massage group is presented in table 4 as follows:

Table 4. Distribution of Pretest and Posttest Work Fatigue in Swedish Massage Group

Category	interval	Pretest		Posttest	
		Frequency	Percentage	Frequency	Percentage
Very tired	34	7	63.64%	0	0.00%
Tired	26 33	4	36.36%	11	100.00%
Less Tired	18 25	0	0.00%	0	0.00%
Lost Tired	17	0	0.00%	0	0.00%
Amount		11	100%	11	100%

Based on table 4. above, it shows that work fatigue before being given swedish massage treatment in the categories of fatigue loss of 0% (0 people), less tired 0% (0 people), tired 36.36% (4 people), and very tired 63.64% (7 people), then at the posttest the fatigue category was 0% (0 people), 0% less tired (0 people), 100% tired (11 people), and very tired 0% (0 people).). These data indicate that there is a decrease in work fatigue after being given swedish massage treatment.

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Table 5. Pretest and Posttest Results of Sport Massage Group Work Fatigue

No Subject	Pretest	Posttest	Difference
1	39	22	17
2	38	23	15
3	38	24	14
4	38	22	16
5	37	23	14
6	35	24	11
7	34	21	13
8	32	24	8
9	31	25	6
10	31	24	7
11	31	15	16
mean	34.91	22.45	
Standard Deviation	3.24	2.73	
Minimum	31.00	15.00	
Maximum	39.00	25.00	

Based on the data in table 5 above, the distribution of work fatigue pretest and posttest for the sports massage group is presented in table 6 as follows:

Table 6. Distribution of Group Work Fatigue Pretest and Posttest Sports Massage

Category	interval	Pretest		Posttest	
		Frequency	Percentage	Frequency	Percentage
Very tired	34	7	63.64%	0	0.00%
Tired	26 33	4	36.36%	0	0.00%
Less Tired	18 25	0	0.00%	10	90.91%
Lost Tired	17	0	0.00%	1	9.09%
Amount		11	100%	11	100%

Based on table 6 above, it shows that work fatigue before being given sports massage treatment in the categories of fatigue loss of 0% (0 people), less tired 0% (0 people), tired 36.36% (4 people), and very tired 63.64% (7 people), then at the posttest the fatigue category was 9.09% (1 person), less tired 90.91% (10 people), 0% tired (0 people), and very tired 0% (0 people). These data indicate that there is a decrease in work fatigue after being given sports massage treatment.

Table 7. Summary of Normality Test Results

Group		p	Sig.	Description
Swedish Massage	Pretest	0.672	0.05	Normal
	Posttest	0.621	0.05	Normal
Sports Massage	Pretest	0.796	0.05	Normal
	Posttest	0.486	0.05	Normal

From the results of table 7 above, it can be seen that all data have a p value (Sig.) > 0.05. then the variables are normally distributed. Since all data are normally distributed, the analysis can be continued with parametric statistics.

Table 8. Summary of Homogeneity Test Results

Group	df1	df2	Sig.	Description
Pretest	1	20	0.951	Homogeneous
Posttest	1	20	0.472	Homogeneous

Table 8 above shows that the pretest-posttest scores are sig. $p > 0.05$, so the data is homogeneous.

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Table 9. T-test Results of Group Work Fatigue Pretest and Posttest *Swedish Massage*

Group	Average	t-test for Equality of means				
		t ht	t tb	Sig.	Difference	%
Pretest	34.73	5,164	2,228	0.000	4.73	13.62%
Posttest	30.00					

From the results of the t-test, it can be seen that the t-count is 5.164 and the t-table (df 10) is 2.228 with a p significance value of 0.000. Because t count 5.164 > t table 2,228, and a significance value of 0.000 < 0.05, this result indicates that there is a significant difference. The effectiveness of swedish massage in reducing work fatigue is 13.62%.

Table 10. T-Test Results of Pretest and Posttest Work Fatigue in Sport Massage Group

Group	Average	t-test for Equality of means				
		t ht	t tb	Sig.	Difference	%
Pretest	34.91	10,640	2,228	0.000	12.45	35.66%
Posttest	22.45					

From the results of the t-test, it can be seen that the t count is 10.640 and the t table (df 10) is 2.228 with a p significance value of 0.000. Because t count 10,640 > t table 2,228, and a significance value of 0.000 < 0.05, this result indicates that there is a significant difference. The effectiveness of sport massage in reducing work fatigue is 35.66%.

Table 11. Swedish Massage and Sport Massage t-test group

Group	Percentage	t-test for Equality of means			
		t ht	t tb	sig,	Difference
Swedish Massage	-13.62%	5,200	2,086	0.000	0.583
Sports Massage	-35.66%				

From the table of t-test results above, it can be seen that the t-count is 5.200 and the t-table (df = 20) = 2.086, while the significance value of p is 0.000. Because t arithmetic 5,200 > t table = 2,086 and sig, 0.000 < 0.05, it means that there is a significant difference. Based on the results of the analysis, the percentage of the effectiveness of sport massage is better than swedish massage on fatigue recovery in laborers or coolies.

DISCUSSION

Based on the results of the analysis showed that swedish massage had a significant effect on the recovery of fatigue experienced by coolies or laborers. This is supported in the journal (Hanief et al., 2019) that swedish massage can relieve pain then also provide relaxation and can also be used as athlete rehabilitation so that they recover quickly and recover. In addition, Swedish massage is also an important support in the success of an athlete to excel in the future, because if an athlete experiences fatigue, his physical condition with this treatment can quickly return to its original condition during competition or after competing.

Swedish Massage is the manipulation of body tissues with special techniques to shorten recovery time from muscle tension (fatigue), increase blood circulation without increasing the workload of the heart (Armada & Putra, 2017). Swedish massage aims to reduce muscle tension due to activity. Muscle tension that occurs is influenced by lactic acid in the blood due to the body's process of releasing energy. Swedish massage is a massage that is carried out by a messure to help speed up the recovery process by using a touch of the hand and without introducing drugs into the body which aims to relieve or reduce complaints or symptoms in several kinds of diseases which are indications for massage. The goals of hand manipulation techniques (massage) include muscle relaxation, improvement of flexibility, reduction of pain, and improvement of blood circulation (Akhmad et al., 2021).

The benefits of Swedish massage performed on the body can provide physiological effects in the form of increasing blood flow, lymphatic flow, stimulation of the nervous system, increasing venous return. Can relieve pain, namely by increasing the pain threshold, because it stimulates increased production of endorphins. Research conducted by (Zaritsky et al., 2021) showed that 90aq can directly increase venous flow in the skin and increase venous return. This increased venous return will help efficiently return blood to the heart, and help drain the lactic acid that has accumulated in the muscles so that it helps accelerate the elimination of lactic acid in the blood and muscles (Moses, 2021).

Based on the analysis data, sport massage is useful to help reduce pain, and help relax muscles, so that it can cure fatigue experienced by workers or coolies. Sport massage has a mainstay of the order and manipulation technique, namely Tapotement and Efflurage which is more needed in the targeted area with the pressure applied must be strong enough, intentionally given directly at the beginning of the massage to cause a shock and stimulate the release of endorphins which function in the stages of reducing lactic acid. (Saputro, 2017).

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Massage after physical activity was given after cooling and stretching. It aims to reduce muscle tension and increase the disposal of metabolic waste that occurs after exercise. In addition, efforts are also made to reduce post-exercise pain that occurs immediately or shortly after physical work, maintain joint range and increase blood and lymph circulation in tense muscles. (Mirawati et al., 2017). The benefits of sports massage after exercise can help speed up muscle recovery to be able to return to a relaxed and rested state. Massage in this situation there is an increase in venous return so that it can increase the process of cleaning metabolic waste.

The results showed that sport massage was more effective than Swedish massage in reducing the level of fatigue experienced by coolies or laborers. This is because sports massage is more suitable to be given to active workers who work a lot with high physical activity. This active activity causes poor circulation and muscle tension. This can be overcome by doing sports massage because sport massage aims to improve blood circulation, reduce muscle tension and muscle elasticity, reduce nervous tension and reduce pain. (Giyanti, 2019).

The difference between these two massages is in the order of the massage locations, sport massage starts with massaging the inferior parts of the body, namely the upper limbs, lower legs, feet, back, then proceeds to a supine position on the upper limbs, calves, back of the feet, abdomen, chest, hands. and ends at the head. Swedish massage starts from the supine position in the superior part of the head, chest, abdomen, arms, hands, legs, ending on the backs of the feet. After that proceed with the prone position starting from the legs, buttocks and ending on the back. Judging from the sequence of manipulation techniques, sport massage starts with effleurage, petrissage, tapotement, shaking and ends with effleurage again. The Swedish massage technique starts with effleurage, petrissage, tapotement manipulation and ends with shaking manipulation.

Sport massage is more effective because the manipulation of sport massage movements is more than Swedish massage. In sports massage the movements include effleurage, petrissage, tapotement, friction, shaking, walken, skin rolling, and chiropractic, while in Swedish massage includes friction, walken, tapotement, skin rolling, and effleurage. With more variations of sports massage movements than Swedish massage, it is faster to overcome work fatigue caused by less smooth blood circulation and accumulation of lactic acid. This can be interpreted that sports massage can be used as a type of therapy used to overcome the fatigue experienced by coolies or laborers. Nurmala (2017) mentions that sport massage is useful for maintaining and restoring weak physical conditions with a stimulating effect on the functions of body organs and adjusting the activities carried out. Sport massage is a type of massage that is often used by athletes to maintain physical fitness. Sport massage has more benefits for improving blood circulation, stimulating breathing, increasing muscle tension, muscle elasticity, and reducing or eliminating nervous tension to reduce pain. (Ripai & Graha, 2018). Sports massage will release the tension and muscle stress that is felt caused by excess physical activity.

Activities carried out by coolies or laborers are very susceptible to causing work fatigue. Work fatigue experienced by coolies or laborers can affect daily activities. Work fatigue experienced by coolies or laborers must be resolved as soon as possible, so that they can support coolies or laborers in their work. Sport massage is one option that can be used. Judging from the physiological function, sport massage is useful to help reduce pain, and help relax muscles so that it can heal the fatigue experienced by athletes after doing sports activities. As stated by Masruro & Rahman Hidayat (2020) mentions that sports massage is useful for improving blood circulation and relieving nervous tension caused by excess physical activity, making it suitable to be applied to active workers.

CONCLUSIONS

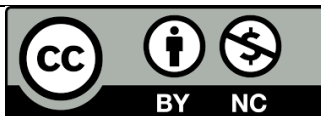
Based on the results of data analysis and discussion, conclusions can be drawn, namely: (1) There is an effect of Swedish massage on fatigue recovery in laborers or coolies. It can be seen that t count is 5.164 and t table (df 10) is 2.228 with a significance value of 0.000 p . Because t count 5.164 > t table 2,228, and a significance value of 0.000 < 0.05, this result indicates that there is a significant difference. (2) There is an effect of sport massage on fatigue recovery for laborers or coolies. It can be seen that t count is 10.640 and t table (df 10) is 2.228 with a p significance value of 0.000. Because t count 10,640 > t table 2,228, and a significance value of 0.000 < 0.05, this result shows that there is a significant difference. (3) Sport massage is better than Swedish massage on fatigue recovery in laborers or coolies. It can be seen from the results of data analysis that t -count is 5.200 and t -table (df = 20) = 2.086, while the significance value of p is 0.000. Because t arithmetic 5,200 > t table = 2,086 and sig, 0.000 < 0.05, it means that there is a significant difference.

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Is The Satisfaction Moderate the Influence of Brand Image and Brand Trust Toward Loyalty of Student?



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ABSTRACT: This study aims to analyze and determine the effect of brand image and college brand trust towards student loyalty and student satisfaction as intervening variables. The number of respondents in this study is 360 students who will be taken as a sample. Then the analytical test used is the Smart PLS 3.0 software. The results of this study shows that the brand image and brand trust have the significance effect on loyalty. However, the brand image has no influence on the student satisfaction, and the following result also shows that the loyalty has not affected by satisfaction of student. Brand image and brand trust has no effect on loyalty through the satisfaction of student.

KEYWORDS- brand image, brand trust, loyalty, satisfaction

I. INTRODUCTION

The existence of universities, in addition to quality and quantity in meeting adequate facilities for the entire academic community, also needs to pay attention to branding strategies. Students who become "customers" of higher education still have to get attention from all elements. However, students who are satisfied with the services and facilities they receive will have a positive impact on the university. In the process of acquiring new students during the enrollment period and retaining students who are already studying, universities must develop a competitive advantage that focuses on the quality of their services (Helgesen & Nasset, 2007).

Competition between universities is growing along with the digital era that has entered every aspect of education. According to Ramadhan (2020), that every university, both public and private, strives to improve its excellence. These advantages are expected to provide different values from other universities (Haryono & Octavia 2020). Meanwhile, according to Mujahidin, et al., (2018), alumni recommendations can also increase the number of students. The patterns and strategies of each of these universities, of course, are to maintain the reputation of the university in the aspect of the assessment of the accreditation agency, or more importantly, the community's assessment. It is this public perception that must be built, including the perception of students who have become part of the university. Their existence will determine the survival of the university. Thus, student satisfaction must be a priority, so that they continue to study at the university until graduation.

According to Ambartiasari, et al. (2018), student loyalty will be strongly influenced by student satisfaction who expects what students want. Students' expectations for these universities must be considered and accommodated. Students as the main stakeholders of higher education should be able to get what they want (Amin, 2017). Student loyalty creates a brand image for colleges during and after their campus life, therefore student loyalty refers to loyalty both during and after the student's study period in college (Hennig-Thurau, et al., 2001).

The challenges of higher education in an effort to maintain a brand image in order to maintain a positive perception in society are increasingly complex. So that universities must remain consistent and continue to improve in providing the best service to students. Students can also be said to be "brand ambassadors" of universities, meaning that whatever their opinions are, they will shape perceptions in society. Having students who want to recommend the college they choose is not an easy problem (Hafifi, 2018). Thus, higher education management must continue to improve to maintain the level of student satisfaction during studies. If student satisfaction is getting better, student loyalty will also be maintained. Because student loyalty is very important for the sustainability and management of higher education (Lewa, 2020). It is possible that the student will provide recommendations to others to enter college. Based on the research results of Nafil & Nasib (2019), it is stated that many universities have involved students in marketing efforts to increase public interest in higher education. In other words, that the existence of student loyalty will also have an impact on the promotion costs of a university which can be minimized (Fadli, et al., 2020).

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According to Nikmah (2015), student satisfaction is one indicator of the success of a university in carrying out its duties and functions as an educational institution. With positive student satisfaction, of course it will affect their behavior in recommending to the public. Universities must continue to conduct surveys on the satisfaction of the performance of lecturers and education staff in providing the expected value to students. So that the survey results can be used as input in improving better services to students (Lestari, et al., 2019). Thus, this will be a proof of the university's commitment in providing satisfaction to all parties.

The brand image of a university is a reflection of how the higher education institution is perceived by the community and stakeholders. Accurate information about the quality of a university is very much needed by the community in order to find a college as a destination for study. Thus, higher education management must also pay attention to what information will be used in marketing programs to create a good brand image in the public. According to Pramudyo (2016), the results of his research state that brand image will be very supportive, especially for prospective new students to decide which university has the best quality. This decision is certainly not easy, considering that prospective students will compare all the brand images of other universities (Lestari, et al., 2019).

The next factor that is no less important in influencing student satisfaction, and then student loyalty, cannot be separated from the important role of the university's brand trust. Students' trust in universities has a huge impact on the reputation and credibility of the college. Although, internally, the reputation of the university is also strongly supported by the quality of the implementation of the tri dharma or even the chess dharma of the university which is carried out by all lecturers. However, according to Syaifullah (2018), students' trust in higher education should not be misinterpreted because it will have a major impact on the future of the university. This of course is closely related to the brand trust built and maintained by universities.

The quality of higher education is closely related to the value at the college. Quality universities can be seen from various aspects, including aspects of accreditation, completeness of lecture facilities, collaboration with domestic and foreign institutions, as well as various internationalization programs and scholarship offers. The process of creating shared value in the type of mental stimulus from services such as higher education is very important, because its success can only be achieved through the involvement and relationship of students with universities to participate in creating the best services.

According to Robinson & Celuch (2016), a university must remain aware that students are supporters who create genuine value in the delivery of educational services. Higher education value creation efforts are also inseparable from the active participatory role of students to interact and collaborate with teachers or lecturers (Dollinger, et al., 2018). Strong brand relationships are needed by higher education institutions to increase awareness of their existence or often referred to as brand awareness (Fleischman, et al., 2015).

In terms of brand awareness of a university, it is closely related to how the university's efforts are in developing brand relationships with students in particular and society in general. Universities that have good quality with all aspects attached to the institution, will not be conveyed properly and widely to the public, if there is no good brand management. Brand management or often called branding, not only conveys about the quality of the university, but is also closely related to efforts to maintain quality and also focuses on student satisfaction as stakeholders.

Based on the description that has been stated in the objectives and objective research, the hypothesis proposed are:

Hypothesis 1: Brand image has a positive effect on satisfaction of student at the private university.

Hypothesis 2: Brand trust has a positive effect on satisfaction of student at the private university.

Hypothesis 3: Brand image has a positive effect on loyalty of student at the private university.

Hypothesis 4: Brand trust has a positive effect on loyalty of student at the private university.

Hypothesis 5: Satisfaction of student has a positive effect on loyalty of student at the private university.

Hypothesis 6: Satisfaction of student mediate the effect of brand image on loyalty of student at the private university.

II. METHODOLOGY

This research will be conducted using quantitative research methods based on the primary data that collected from the student through online questionnaire. Then, for the next stage is tabulate data using a Likert scale, with a score of 1 to 5.

There are 3 (three) types of variables, namely:

a) The dependent variable: student loyalty (Y).

b) Independent variables, involve of brand image (X1), and brand trust (X2).

c) Mediating variables: student satisfaction (M).

This study uses data analysis, namely Partial Least Square (PLS) analysis.

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III. RESULT AND DISCUSSION

The approach used in this research is the quantitative approach. This study uses a questionnaire given to respondents, namely students in private university. Respondents who fill the online questionnaire in this study were 360 students. This study uses data analysis, namely Partial Least Square (PLS) analysis. The research instrument test included an inner model test, outer model, path diagram conversion, estimation, goodness of fit and hypothesis tester (Resampling Bootstrapping).

A. Convergence Test Validity

The result of convergence test validity of indicators that have values less than 0,500 must be excluded from the model because they are considered to be unreliable and insignificant. Furthermore, a reestimation of the model is performed. The result obtained from this study are all indicators of variables that have a value of more than 0.500 can be used to be used as a measurement tool.

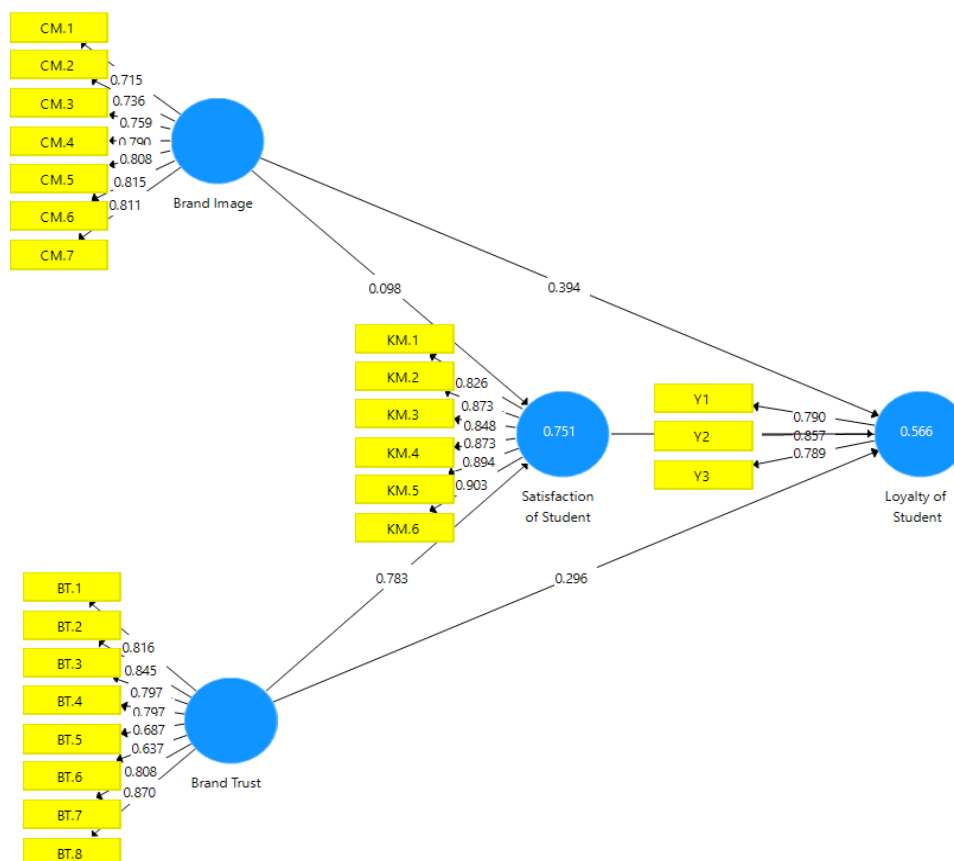


Figure 1. Research Framework (PLS Model)

B. Discriminant Validity Test

Discriminant validity refers to the degree of discrepancy between attributes that should not be measured by the measuring instrument and theoretical concepts about the variable. Discriminant validity can be said to be achieved if the Average Variance Extracted (AVE) value is greater than 0.500.

Table 1. Discriminant Validity Test

Variables	Average Variance Extracted (AVE)
Brand Trust	0.617
Brand Image	0.604
Satisfaction of Student	0.757
Loyalty of Student	0.661

C. Composite Reliability Test

A composite reliability test is performed to test the reliability of the research variables. Table 2 is illustrated the composite reliability test results.

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Table 2. Composite Reliability Test

Variable	Composite Reliability
Brand Trust	0.928
Brand Image	0.914
Satisfaction of Student	0.949
Loyalty of Student	0.854

The reliability composite test is described to be reliable if the composite reliability value is graters than 0.700. According to the data in table 2 is showed that all of the composite reliability values of variables are reliable.

D. Structural Model Analysis

The structural model analysis is done by evaluating the results of estimated path coefficient parameters and their level of significance (less than 0.005). The test results for the significance of the path coefficient of each variable can be seen in table 3, and indirect effect in table 4.

Based on the result in table 3 is shown that the brand image has no effect to satisfaction of student (P values more than 0.005). As in previous research, it was stated that brand image has no effect on satisfaction (Wahyuni & Ghozali, 2019); (Gunardi & Erdiansyah, 2019); (Rofiq, Firdi, & Respati, 2020). Likewise, the satisfaction of student has no influence towards the loyalty (Hayati, et.al, 2021); (Aprilia, 2021); (Nurdyastuti & Awatara, 2018).

Table 3. Parameter Coefficient and Statistical Values among Variables

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (O/STDEV)	P Values
Brand Image -> Loyalty of Student	0.394	0.398	0.074	5.357	0.000
Brand Image -> Satisfaction of Student	0.098	0.096	0.053	1.846	0.066
Brand Trust -> Loyalty of Student	0.296	0.294	0.100	2.965	0.003
Brand Trust -> Satisfaction of Student	0.783	0.784	0.051	15.363	0.000
Satisfaction of Student -> Loyalty of Student	0.105	0.105	0.079	1.330	0.184

Table 4. Specific Indirect Effects

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics (O/STDEV)	P Values
Brand Image -> Satisfaction of Student -> Loyalty of Student	0.010	0.010	0.010	1.009	0.313
Brand Trust -> Satisfaction of Student -> Loyalty of Student	0.082	0.082	0.062	1.314	0.189

Table 4 showed that P values of specific indirect effects more than 0.005, which means that the brand image has no influence on loyalty of student through satisfaction of student. Including the results of the analysis the effect of brand trust toward loyalty of student, there is no significant effects that mediated by satisfaction of student.

IV. CONCLUSIONS

The result showed that the brand image and brand trust become the variable that have the significant influence on loyalty of student, respectively. In other side, brand trust also has the significant effect on satisfaction of student. On contrary, brand image

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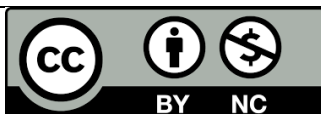
has no effect on student satisfaction, nor does loyalty affect student satisfaction. Brand image and brand trust has no effect on loyalty through the satisfaction of student. This means that there is no indirect effect, respectively.

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Customer Satisfaction among Nursing Officers: Experience of Service Recipients at a District Health Office in Sri Lanka



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ABSTRACT

Introduction: Customer satisfaction, efficiency and effectiveness are key essential characteristics of good service delivery. Unacceptable delays in providing services and subsequent re-visits had created customer dissatisfaction with services provided by the Regional Director of Health Services' Office, Kurunegala. A descriptive cross-sectional study was conducted to assess the current levels of customer satisfaction, efficiency and effectiveness of service provision to nursing officers at the Regional Director of Health Services' Office, Kurunegala.

Methods: Ten services offered to nursing officers from Establishment Branch were prioritized for the assessment. The research adopted mixed methods and involved a customer survey, a desk review, key informant interviews and focus group discussions. Proportions, percentages and means were calculated for quantitative data and z test for percentages was applied as appropriate. The p-value <0.05 was considered significant. Narrative analysis was done for qualitative data.

Results: Major deficiencies identified were non-availability of service standards, ineffective two-way communication and submitting incomplete documents by applicants. Compliance of nursing officers' files with service standards was 40%. It was revealed that 56.6% of nursing officers had to revisit on average 2.4 times to receive the requested service. Only 11.5% of nursing officers were satisfied with the service provision. Suggested solutions include complying with developed service standards, establishing an effective feedback response system, developing document submission checklists, format compilations and a booklet on work steps.

Conclusions: The customer satisfaction, efficiency and effectiveness of services to nursing officers at RDHSK was unsatisfactory. It is recommended to implement interventions to improve service delivery by the Establishment Branch of RDHSK for healthcare staff category-wise.

KEYWORDS: Efficiency, Effectiveness, Services, Nursing officers, Establishment Branch, Regional Director of Health Services' Office.

I. INTRODUCTION

The Office of Regional Director of Health Services is the administrative focal point for health institutions including hospitals (ranging from large to small) and Medical Officer of Health (MOH) Offices offering comprehensive public health services in each district of Sri Lanka. The Office of Regional Director of Health Services, Kurunegala (RDHSK) is the administrative focal point for Kurunegala District and has four branches. Out of which, the Establishment Branch (EB) has the largest external customer interface of 5044 health workers in 63 categories of 129 health institutions coming under the directorate.¹ It deals with routine but critical personal file-related services. Consequently, catering with efficient and effective services to the satisfaction of a large number of service recipients using limited resources has been a challenge for the management of RDHSK.

Lack of explicit service standards for the EB of RDHSK results in unacceptable delays in service provision and frequent unwarranted visits by the service users. Ineffective two-way communication between the EB and service using healthcare staff builds a dilemma among service users on documents that need to be submitted along with service requests, which adds up to the delay. Besides, there is no existing mechanism to tackle service users' grievances on poor service provision. These factors collectively create dissatisfaction among service users of EB. Therefore, the assessment of the current levels of customer

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satisfaction, efficiency and effectiveness of service provision to the healthcare staff at the EB of RDHSK is important to identify deficiencies and thereby to improve customer satisfaction by devising well-targeted and effective initiatives.

Customer satisfaction is defined as a measurement that determines how happy customers are with a company's products, services, and capabilities. An organization's main focus must be to satisfy its customers regardless of being profitable or not. Customer satisfaction information can help an institution determine how to best improve its products and services. Organizations should not assume that they know what the customers want. Instead, it is important to understand the true voice of customers, using tools such as customer surveys, focus groups, and polling. Organizations can gain detailed insights on what the customers want through such tools and better tailor their services or products to meet or exceed customer expectations.² Efficiency and effectiveness are key essential characteristics of good service delivery. Effectiveness is the extent to which an activity fulfils its intended purpose or function whereas efficiency is the extent to which an activity achieves its goal whilst minimizing resource usage.³ Peter Drucker defines 'Effectiveness is doing the right things; efficiency is doing things right'.⁴ Ineffective and inefficient processes are costly in terms of money, delays and customer dissatisfaction.⁵ Organizations can be assessed from either an efficiency or effectiveness perspective. Efficiency measures how successfully the inputs have been transformed into outputs without waste. Effectiveness measures the degree to which a business achieves its goals. Having a clear view of current organizational effectiveness and customer expectations is a critical success factor.⁶ Organizational efficiency reflects the improvement of the internal processes of the organization.⁷ Improving the quality of service delivery is a challenge in many developing countries. Moreover, traditional systems of administration have failed to respond to the citizens' quest for efficient and effective public service delivery.⁸ Process mapping is a way of reviewing existing processes for improving them for maximum efficiency and effectiveness.⁹

A service standard helps to define what a customer can expect from a service and how the service should be delivered by the service provider such as in terms of timeliness, accuracy and suitability.¹³ Service standards have two main goals: Establish yield objectives for employees and inform the customer about what they have the right to expect. When clearly stated, service standards equip the personnel with the right tools to bring about the service recipient satisfaction and facilitate engagement of the service provider.¹⁴

II. METHODS

A descriptive cross-sectional study was conducted during August 2019 at the Establishment Branch to assess the customer satisfaction, efficiency and effectiveness of service provision to nursing officers by the Establishment Branch of Regional Director of Health Services' Office, Kurunegala.

As the processes of personal file related services were unique for each healthcare staff category, the assessment of the efficiency and effectiveness of services need to be specific to each healthcare staff category. Based on the size of the customer interface, the volume of issues faced by the service providers and project feasibility, the category of nursing officers was chosen for the assessment. The topmost seven services resulting in 81.9% of visits of nursing officers to EB were identified based on the data gathered from nursing officers. Those services included obtaining the formal letter of appointment, registration under the widows' /widowers' & orphans' pension scheme, approving an annual increment, confirmation in the service, Grade II promotion, Grade I promotion and Supra Grade promotion. Another three services being provided to nursing officers i.e.: obtaining foreign leave, prior approval for retirement and retirement were identified by the RDHSK staff based on the urgency, importance and volume of issues faced by them. Those ten services were prioritized for assessing the current level of efficiency and effectiveness of service provision.

A core group of seven members consisting of four Management Assistants providing services to nursing officers at EB, the Senior Management Assistant, the Administrative Officer and the Deputy Regional Director of Health Services was formed for developing service standards through re-designing of processes. The routine process of providing the selected services was mapped by the principal investigator using qualitative data gathered through observation, Key Informant Interviews (KII) and Focus Group Discussion (FGD) held with service providers of RDHSK who take part in each process. The process extended from the point of collecting the documents by the RDHSK staff from the applicant nurse up to the receipt of completion or rejection letter by the applicant. The workflow of the services was drawn up considering preparations, recommendations, certifications, approvals etc. along with the officers responsible for each point. Then the processes were studied extensively by the core group to identify deficiencies in service provision. The delays between points were identified and the possible ways to minimize delays were examined. The possibilities for delegation were considered. Repetitions and redundant steps were eliminated. Quality requirements to be met at each point were identified. Finally, the core group came up with a redesigned process. The time required between points of the workflow was assessed keeping a margin for service contingencies. Then the total time duration

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needed to deliver each service in days was calculated to set service standards. Nursing officers receiving services from RDHSK and the staff of RDHSK providing services to nursing officers were consulted on the total time duration needed to deliver each service (service standard) before finalizing it.

The current research adopted a mixed-method approach. Key Informant Interviews, Focus Group Discussions, a desk review and a customer survey were used for collecting data. The customers were surveyed using an interviewer-administered questionnaire which consisted of open and closed-ended questions. The face validity and content validity of the questionnaire were ensured through reviewing literature and discussions with relevant stakeholders and experts in the field including a Consultant Community Physician and a Consultant Medical Administrator. The survey aimed to assess the several important socio-demographic variables of participant nursing officers, service/s the participants were seeking and the number of visits made to receive each service from the EB of RDHSK, service expectations of nursing officers when receiving services from EB, nursing officers' satisfaction on selected attributes of service provision from EB and their suggestions for service improvements. The entire population of nursing officers (n=122) who visited EB and completed receiving prioritized service/s for four consecutive Wednesdays, which were public days, were surveyed using a structured interviewer-administered questionnaire. Hence, no sampling method was adopted. A convenient sample (n=50) of personal files of nursing officers from files that had been completed in the selected services (five files per service) during a month was chosen for the desk review. The checklist used in desk review assessed the number of personal files that complied with the set service standards. The KIIs and FGDs were conducted to identify issues faced by service providers of RDHSK in providing services at EB to nursing officers and to probe their suggestions for service improvements. The KIIs were held with the Regional Director of Health Services, the Deputy Regional Director of Health Services, the Medical Officer of Quality Management Unit and the Administrative Officer of the RDHSK using a structured interviewer guide. Two FGDs were conducted with service providers who involve in providing selected services to nursing officers at EB of the RDHSK using an FGD guide. The Senior Management Assistant, Management Assistants (n=6) providing prioritized services at EB, and the Management Assistant and the Health Activity Assistant at Tappal of RDHSK took part in discussions. The KIIs and FGDs were conducted by the principal investigator.

Quantitative data were analyzed using Statistical Package for Social Sciences (SPSS) software. The proportions, percentages and means were calculated where appropriate. The statistical significance of the differences in nursing officers' service expectations and their satisfaction was analyzed by applying the two-sample z test for percentages. The p-value <0.05 was considered as the level of significance. The KIIs and FGDs were electronically recorded with the participant's consent and transcribed. Narrative analysis was done for qualitative data. Ethics clearance for the study was obtained from the Ethics Review Committee of the Faculty of Medicine, the University of Colombo following approval of the Board of Study in Medical Administration. Administrative approvals were obtained from the Provincial Director of Health Services of North-Western Province and the Regional Director of Health Services of Kurunegala District before starting the study. Informed consent was obtained from all participants. The confidentiality and anonymity of study participants were preserved. The principal investigator carried out data collection and closely monitored the process to assure reliability. The principal investigator had no affiliations with or involvement in any organization or entity with any financial or non-financial interest in the subject materials discussed in this research.

III. RESULTS

Overall, the customer satisfaction, current level of efficiency and effectiveness of providing services to nursing officers at the EB of RDHSK was found to be unsatisfactory. The findings of the quantitative and qualitative components are outlined below.

Quantitative results

Quantitative data were gathered through the customer survey, checklist and the quantitative elements of KIIs and FGDs. Based on the quantitative data gathered from the customer survey, the frequency distribution of services visited by nursing officers at EB is listed in table 1.

Table 1: Distribution by services visited by nursing officers at Establishment Branch

	Service	Frequency	Percentage	Cumulative percentage
1	Annual increment	40	32.8	32.8
2	Registration for widows'/ widowers' & orphans' pension scheme	37	30.3	63.1
3	Grade promotions (Grade I, II & Supra Grade)	12	9.8	72.9

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4	Service confirmation	07	5.7	78.6
5	Formal appointment letter	04	3.3	81.9
6	Maternity leave	03	2.4	84.3
7	Others	19	15.7	100.0
	Total	122	100.0	100.0

The services that needed 81.9% of visits by nursing officers to EB were prioritized for the assessment.

The service standards of prioritized ten services that were developed following process mapping and redesigning are as below (Table 2).

Table 2: Service standards for the prioritized ten services offered to nursing officers

	Service	Service standard
1	Forwarding the request for obtaining the formal letter of appointment to the Provincial Director of Health Services' office	02 days
2	Forwarding the request for registration under the widows'/widowers' & orphans' pension scheme to the Provincial Director of Health Services' office	02 days
3	Forwarding the approval of annual increments to the Salary Branch of the Regional Director of Health Services' office	05 days
4	Forwarding the request for confirmation of the service to the Provincial Director of Health Services' office	07 days
5	Forwarding the request for the promotion from Grade III to Grade II to the Provincial Director of Health Services' office	07 days
6	Forwarding the request for the promotion from Grade II to Grade I to the Provincial Director of Health Services' office	04 days
7	Forwarding the request for the promotion from Grade I to Supra Grade to the Provincial Director of Health Services' office	04 days
8	Forwarding the request for recommending foreign leave with full pay (personal/duty) to the Provincial Director of Health Services' office	03 days
9	Forwarding the request for obtaining the prior approval for retirement to the Provincial Director of Health Services' office	10 days
10	Forwarding the PD 03 format to the Pensions Department	14 days

Table 3 shows the quantitative results of desk review, selected quantitative results of the survey, and quantitative results of KIIs and FGDs.

Of the files, 40% complied with service standards of prioritized services. Among nursing officers 56.6% revisited the RDHSK for receiving prioritized service/s. A nursing officer on average had to pay 2.4 visits per service to the RDHSK to get the requested service completed. Three out of 13 service providers were satisfied with the level of efficiency and effectiveness of providing prioritized services to nursing officers at EB.

Table 3: Key findings of the desk review, survey, KIIs and FGDs

	Indicator	Result
1.	Percentage of files complying with service standards of prioritized services	40.0
2.	Percentage of nursing officers revisited the RDHSK for receiving prioritized service/s	56.6
3.	The average number of visits to RDHSK per service to get the requested service	2.4
4.	The proportion of service providers satisfied with the level of efficiency and effectiveness of providing prioritized services to nursing officers at EB	3/13

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The difference between nursing officers' service expectations and satisfaction over the selected service attributes at EB were tested statistically to find out the attributes that do not meet the service expectations. The results are as in table 4.

Table 4: Distribution of nursing officers' service expectations and satisfaction on selected service attributes

	Attribute	Expectation (P) N=122	Satisfaction (P) N=122	Statistical significance
1.	Awareness of all documents required with a service request	100.0 (122/122)	0.0 (0/122)	$z=-15.62$ $p<0.001$
2.	Awareness of the place of formats can be obtained	41.8 (51/122)	9.0 (11/122)	$z=5.88$ $p<0.001$
3.	Awareness of duration required to deliver the services	100.0 (122/122)	1.6 (2/122)	$z=15.366$ $p<0.001$
4.	Immediate notification in delay (<i>If relevant only</i>)	100.0 (122/122)	0.0 (0/122)	$z=15.62$ $p<0.001$
5.	Availability of contact details of the responsible officer	59.8 (73/122)	60.6 (74/122)	$z=-0.13$ $p>0.001$
6.	Complaints handling (<i>If relevant only</i>)	98.4 (120/122)	0.0 (0/122)	$z=15.36$ $P<0.001$
7.	Promptness of service delivery	100.0 (122/122)	22.1 (27/122)	$z=12.47$ $p<0.001$
8.	Easiness of getting services	100.0 (122/122)	4.1 (5/122)	$z=14.99$ $p<0.001$
9.	Courtesy of staff	53.2 (65/122)	9.8 (12/122)	$z=7.30$ $p<0.001$
10.	Overall satisfaction		11.5 (14/122)	

P=Proportion

Service expectations of nursing officers were 100% for the attributes of being aware in advance of all documents required with a service request, being aware of the time taken to deliver services, immediate notification in delays, promptness of service delivery and easiness of getting services. The complaints handling was also expected by 98.4% (n=120) of participant nursing officers. The remaining attributes of availability of contact details of the responsible officer, courtesy of the RDHSK staff and awareness in advance of the place of formats were expected by 59.8% (n=73), 53.2% (n=65) and 41.8% (n=51) of participants respectively. Among nursing officers, 11.5% (n=14) were satisfied with service provision at EB overall. The current level of satisfaction on three attributes (awareness in advance of all documents required with a service request, immediate notification in delay and complaints handling) was zero. Availability of contact details of the responsible officer showed the highest satisfaction which was 60.6% (n=74). The promptness of service delivery, courtesy of staff, awareness in advance of the place of formats, easiness of getting services and awareness of time taken to deliver services demonstrated 22.1% (n=27), 9.8% (n=12), 9.0% (n=11), 4.1% (n=5) and 1.6% (n=2) of satisfaction respectively. Significant differences ($p<0.001$) were observed between the nursing officers' service expectations and the satisfaction on all service attributes except for the attribute 'Availability of contact details of responsible officer'.

Nursing officers' service expectations were compared with their satisfaction on selected service attributes of EB and depicted below (Figure 1).

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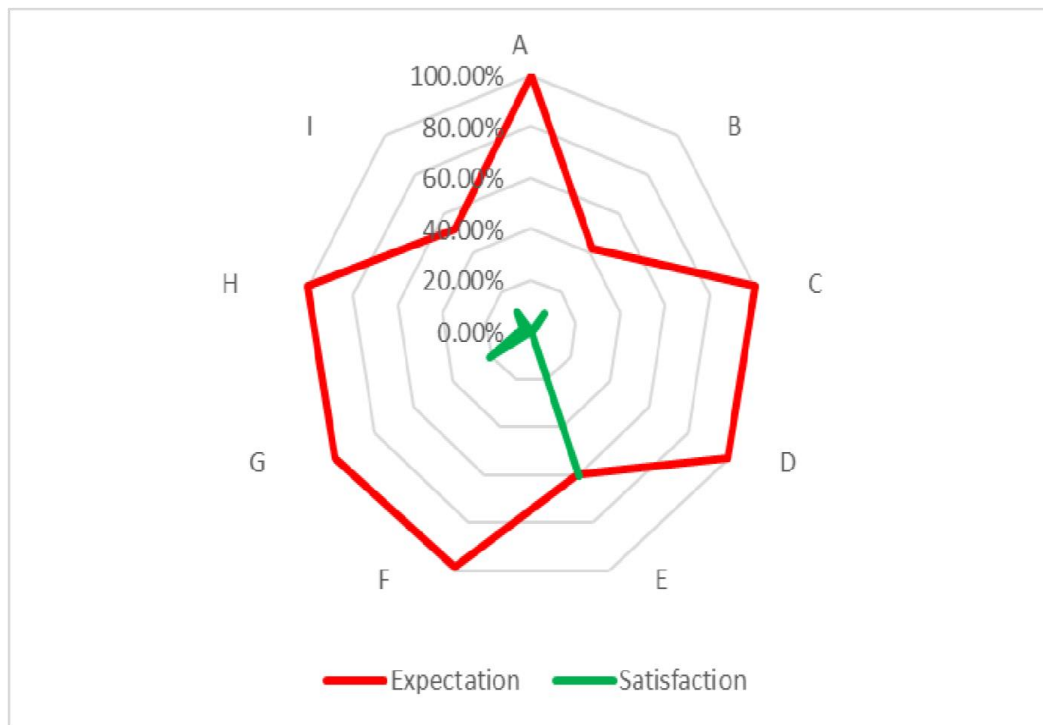


Figure 1: Comparison of nursing officers' expectations with nursing officers' satisfaction on service attributes

There was a considerable gap between the nursing officers' expectations and their current level of satisfaction except for the 'Availability of contact details of responsible officer'.

Qualitative Results

Qualitative inputs of KIIs, FGDs and the customer survey combined with mapping the process of providing services to nursing officers at EB identified the following deficiencies. There were no explicit service standards for the services offered to nursing officers and therefore the time to deliver services was unacceptably long and varied. Applicants had to visit the EB several times for follow up. The two-way communication between RDHSK and applicant nursing officers was not satisfactory. The applicants were not aware of the documents and other requirements that need to be fulfilled for receiving the required service/s. Nursing officers had to visit the RDHSK to collect application formats then and there they need those. The subject officers accepted requests without checking the completeness of documents and they had no mechanism of referring lengthy lists of documents for crosschecks. Missing or incompleteness of one or more documents resulted in rework and added up to the delay. When a subject officer is on leave, the covering up officer does not know the work steps to be followed. On top of that, the grievances of nursing officers were not appropriately dealt with by the RDHSK staff, and nursing officers' suggestions were never sought for service improvements.

The suggestions for service improvements gathered from nursing officers through the customer survey and service providers of RDHSK through KIIs and FGDs combined with process mapping identified the following solutions to improve the efficiency and effectiveness of providing services to nursing officers at EB of RDHSK.

1. Publicizing of and adhering to developed service standards in providing prioritized ten services to nursing officers at EB
2. Implementing an effective feedback and response system to redress nursing officers' grievances on service inefficiencies at EB and utilizing received suggestions for improving services offered to nursing officers at RDHSK
3. Developing document submission checklists based on the required documents to be filled for receiving services by applicant nurses
4. Compilation of formats to be filled by applicants for each service with the relevant checklist on the top and making compilations available at nursing officers' work institutions
5. Developing a booklet incorporating redesigned work steps for prioritized ten services to be followed by subject officers and covering up officers at the EB

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IV. DISCUSSION

This descriptive cross-sectional study aimed at assessing the customer satisfaction, efficiency and effectiveness of providing services to the nursing staff at the RDHSK. Ten services offered to nursing officers by the Establishment Branch (EB) of RDHSK were prioritized for the assessment.

This study adopted mixed methods for understanding the contradictions between quantitative results and qualitative findings if any. An interviewer-administered questionnaire was preferred over a self-administered one as the respondents might need clarifications about items in the questionnaire, especially in the service attributes section. Process mapping, a way of reviewing existing processes for improving them for maximum efficiency and effectiveness was combined with qualitative and quantitative data to identify deficiencies in service provision to nursing officers at EB.

The services that are mostly ineffective and inefficient were prioritized for inclusion in the assessment. Service standards in terms of days that take to complete each service were calculated as there were no nationally accepted norms for referring. The majority of services in the prioritized list cannot be completed within the RDHSK and need forwarding to the Provincial Director of Health Services' office for completing the rest of the steps.

The checklist data showed that only a minority of files as low as 40% complied with service standards. According to the survey data, a majority (56.6%) of nursing officers revisited the RDHSK for receiving intervened service/s. Non-availability of service standards, ineffective two-way communication between service receivers and providers, and submitting incomplete documents resulted in delayed personal file-related services and repeat visits by nurses. Hence, an applicant nurse had to pay on average 2.4 visits to RDHSK per service to complete getting the requested service. The number of service providers satisfied with providing services to nursing officers at EB was calculated using the qualitative data gathered from KIIs and FGDs. Only a very few service providers, three out of 13, was satisfied with the level of efficiency and effectiveness of service provision to nursing officers at the EB. They were aware of the inefficiencies in service provision and seeking for solutions to rectify them by the time of assessment. A section on nursing officers' service expectations was incorporated into the survey questionnaire as a means of a needs assessment. Out of the nine service attributes used to assess the service expectations, five attributes which are awareness in advance of all documents required with a service request, awareness of time taken to deliver services, immediate notification in delay, promptness of service delivery, and easiness of getting services were expected by all (100%, n=122) participants. The attribute 'proper complaints handling' was expected by 98.4% (n=120) of service recipients. Those needs highlight the nursing officers' quest for receiving efficient and effective services from EB. The remaining attributes i.e.: awareness in advance of the place of formats, availability of contact details of the responsible officer and the courtesy of staff were expected by a relatively lesser number of participants. Availability of contact details of the responsible officer to be contacted in a service need was expected by 59.8% (n=73) of nursing officers as most of them had contact details of EB and RDHSK before the assessment. A 53.2% (n=65) of nursing officers expected the RDHSK staff to be courteous while providing services to them. The rest thought that the timeliness matters over the courtesy. Being aware in advance of the place of formats scored the minimum expectation of 41.8% (n=51) and the rest did not expect to be aware of the place of formats as they knew traditionally those were kept at RDHSK. The nursing officers' satisfaction on the same selected service attributes at EB was assessed. Satisfaction of nurses on all attributes except attribute 'availability of contact details of the responsible officer' showed a very low score (Table 4). Among them, three attributes namely awareness in advance of all documents required with a service request, immediate notification in delay when relevant, complaints handling reported zero satisfaction. It reflects the poor awareness of nursing officers in advance of the documents required with a service request and the non-availability of mechanisms at RDHSK for immediately notifying in a delay and handling complaints of service users. The attribute 'availability of contact details of the responsible officer' showed the highest satisfaction of 60.6% (n=74) because most of the nursing officers had contact numbers of EB and RDHSK both even though contacting them gave them no relief for the issues faced. The remaining service attributes that include awareness in advance of the place of formats, awareness of the time taken to deliver services, promptness of service delivery, easiness of getting services and courtesy of the RDHSK staff resulted in very low satisfaction scores. It is a result of poor awareness in advance of the place of formats, poor awareness of services delivery standards, delays in completing nursing officers' service requests, overall difficulty in getting services and issues in the courtesy of the serving staff of RDHSK. The overall satisfaction was very low (11.5%, n=14) owing to the poor satisfaction on service attributes described above. The non-availability of support personnel to contact in difficulty in getting services, not seeking nurses' suggestions for service improvements and need to visit RDHSK for collecting the required formats when a service is required had an impact on the poor overall satisfaction. The difference between the satisfaction of nursing officers and their expectations was statistically significant for all attributes except attribute 'availability of contact details of the responsible officer' proving the deficiencies in efficiency and effectiveness of the services offered to healthcare staff by the RDHSK.

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Kotler et al.¹⁵ describe satisfaction as a feeling that surfaces from an evaluation process when the consumer compares what is received against what is expected from the utilization. Therefore, nursing officers' expectations on service provision were compared with satisfaction to identify further gaps. It was evident that all attributes except one (availability of contact details of responsible officer) had expectation-perception gaps (Figure 1) that need to be bridged through appropriate interventions.

Attribute 'availability of contact details of the responsible officer' yielded slightly greater satisfaction (60.6%) than expectation (59.8%) because most of them had the contact details of EB and RDHSK even though contacting them was not fruitful.

The study found issues of non-availability of service standards, ineffective two-way communication between service receivers and providers, and submitting incomplete documents which resulted in delayed personal file-related services and repeat visits by nursing officers leading to external customer dissatisfaction. The suggestions of the service receivers and service providers identified specific solutions to each issue.

V. CONCLUSIONS

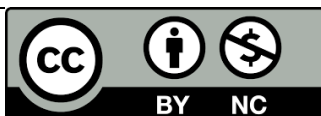
The customer satisfaction, efficiency and effectiveness of providing services to the nursing officers at RDHSK were found to be unsatisfactory primarily due to the non-availability of explicit service standards, ineffective two-way communication between RDHSK and applicants, and submission of incomplete documents for receiving services with special reverence to services provided to nursing officers at EB. The solutions suggested by the service receivers and service providers for the identified issues include complying with service standards set for prioritized services being offered to nursing officers at EB of RDHSK, developing an effective feedback and response system, welcoming suggestions of nursing officers for service improvements, developing lists of the document and other requirements that need to be fulfilled for receiving the service/s and then document submission checklists, compiling formats to be filled by applicants with the relevant checklist on the top and making them available at their workplaces, and developing a booklet on redesigned work steps to be followed by subject officers and covering up officers at the EB.

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Benefits and Challenges of Taking English Courses Abroad: A Case Study of FPT University Students



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ABSTRACT: There are many different ways to learn English effectively, and joining English courses abroad is one of them. FPT University is implementing this method to improve students' English ability, contributing to strengthening the internationalization and globalization of this international standard university. From the actual research at FPT University, this article mentions the great benefits of the method, including (1) Students have a favorable environment to practice using English, (2) Students learn to live independently, (3) Enhance the experience of student life, and (4) Besides English, students have many opportunities to learn about many other things. In addition, the five most common challenges related to this method of English improvement were also found to be (1) Program costs are high, (2) Lack of confidence in the ability to use English, (3) Participants must get out of their "safe zone", (4) Participants must be away from loved ones for quite a long time, and (5) Participants may face safety risks. Since then, combined with the author's research, some suggestions have been made so that the program's quality is improved, more students can know and participate in the program.

KEYWORDS: Abroad, benefits, challenges, English courses, learn English, students

I. INTRODUCTION

As we all know, English is a global language (according to Rao, 2019). Many people around the world have been working hard to learn English to master this prevalent language. There are many different ways to acquire and use English, such as self-studying at home using apps, websites, and youtube, studying through schools or centers, foreign language clubs, community activities, etc. Not to be missed is studying English through short-term courses abroad.

At FPT University – Vietnam, English is very important in training. 100% of students enter the specialized study stage with an English level equivalent to IELTS 6.0. There are a total of 6 English levels for the preparatory stage; after taking the English placement test, students will know what level of English they have achieved and accordingly be placed in the appropriate class. With the orientation to enhance the experience of using language, many English courses in Australia, The Philippines, Singapore and Malaysia are held annually for students at the highest level, with the subject code TRS501.

II. LITERATURE REVIEWS

When it comes to the benefits of study abroad programs, there has been much research. These include Twombly et al. (2012), who analyzed the great benefits of studying abroad in a new global century. Many of the benefits of studying abroad have been covered in great detail and persuasiveness in this research. In addition, in the opposite direction, the difficulties encountered when studying abroad have also been studied by Trilokekar and Kukar (2021); being disoriented in one or more stages while abroad is one of the experiences inevitable and most challenging of all international students.

On a narrower scale, about the benefits of studying English abroad, we see research by quite a few researchers like Sasaki (2007); the author has analyzed the positive effects of traveling abroad learning in improving foreign language ability, mainly English writing skills. Alternatively, another study by Trentman (2013) also mentioned some issues of accessing and using Arabic and English during study abroad in Cairo, Egypt.

As for learning English at FPT University, according to Vo et al. (2020), there are quite a few challenges that a student of general English may have to face at this TRS501. A survey of 50 students and 3 faculty members found that the three most common challenges to students' reading comprehension at TRS501 were vocabulary, grammar, and inability to identify sentences answer. However, this study focuses on students who have studied this subject in Vietnam rather than abroad and only focuses on reading

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comprehension. Therefore, this study focuses more deeply on the benefits and challenges of learning English through short-term study abroad programs.

III. METHODOLOGY

To elucidate the benefits and challenges of attending English courses abroad of FPT University students, the author has used a combination of both qualitative and quantitative methods. Specifically, the author collected information from 3 staff of the International Cooperation Department, who directly organized the above English study abroad programs and 50 students who had participated in the program. This study abroad program replaces taking the ETR501 course in Vietnam. The implementation method is face-to-face interviews and online surveys through Facebook, Zalo, and email. In addition, the author also relies on information from studies, books, and newspapers with topics related to the content being studied. From there, the author synthesizes, analyzes, compares, and contrasts to give the most objective and accurate results. The total duration of the study was 3 months. The ultimate aim is to highlight the benefits of the program in order to attract more students to the program. Besides, clarify the limitations the remaining disadvantages, challenges so that the program implementers can adjust and improve the program.

IV. RESEARCH RESULTS AND DISCUSSION

To clarify the benefits of participating in English courses abroad, the author discussed with the human resources department of the International Cooperation Department, FPT University, and the results were four benefits. The main points are as follows: (1) Students have a favorable environment to practice using English, (2) Students learn to live independently, (3) Enhance the experience of student life, and (4) Besides English, students have many opportunities to learn about many other things. Based on these initial results, the author surveyed the agreement level of 50 students who had participated in the program, and the results were as shown in the following table and figure.

Table 1. Level of agreement about the benefits of taking English courses abroad

Benefit	Strongly disagree	Disagree	Neither agree or disagree	Agree	Strongly agree	Total Reply	Total Score
	1	2	3	4	5		
(1) Students have a favorable environment to practice using English	0	0	2	12	36	50	234
(2) Students learn to live independently	0	2	0	15	33	50	229
(3) Enhance the experience of student life	1	3	7	15	24	50	208
(4) Besides English, students have many opportunities to learn about many other things	1	0	1	25	23	50	219
							890

This result clearly shows that, in general, 50 students surveyed have a high degree of agreement with the benefits that the author discussed with the people who directly organize the program. The highest benefit is that students have a favorable environment to practice using English, with a total score of 234. Especially, 36/50 students agree at the highest level, accounting for 72%. This result is quite understandable because if students study English in Vietnam, the practice of using foreign languages will almost wholly stop when students leave the classroom. However, when studying abroad, students have many opportunities to practice listening, speaking, reading, or even writing skills in daily life, through daily activities such as shopping, going on a picnic, communicating with foreign roommates, etc. In addition, even during class hours, group discussions or pair work are also conducted in English - this is extremely difficult to do if their classmates are English. have the same nationality. In their study in 2020, Daif-Allah and Aljumah agreed with this view; trying to use the language learners are learning to communicate with classmates of different nationalities has great effect and promotes language mastery. Not only that, when studying abroad, direct interaction with native teachers, or at least teachers who do not speak the learners' native language, will also contribute to stimulating the development of students in terms of student language a lot. This view has been clarified by many researchers, such as Walkinshaw and Oanh (2014), Al-Khasawneh (2017), Mohammed (2018), etc.

As mentioned above, for students of FPT University, most students must complete this English learning phase in the first year. This means that their typical age is 18-19 years old, and they have just finished high school. In the context of Vietnamese culture, it

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can be said that this is the first time in a Vietnamese person's life where he must learn to live independently; of course, this degree of independence is also quite different for individuals. So in the condition of being away from family, coming to a foreign country to learn English is a perfect opportunity for practicing an independent and more mature lifestyle. Agreeing with this view, Nielsen, in her study in 2014, said that studying abroad has made a significant contribution to promoting a person's maturation process. Going back to this study, up to 96% of the students surveyed agree and strongly agree with this great benefit of taking an English course abroad. Discussing more closely with two students who disagreed with the above view, the author concluded that both of these learners believe that independent life is mainly due to each person, not the impact of outside living.

In higher education orientation, the student experience is an essential factor that many universities and colleges need to aim for (Mupenzi, 2018). From this point of view, the author and three experts from the International Cooperation Department agreed that participating in a short-term English study abroad helped enhance student life experience a lot. However, such a course that lasts from 1 to 3 months may not be long enough for learners to experience many things in a new country, so 11 out of 50 students choose strongly disagree, disagree, and neutral, accounting for 22%. However, nearly 50% of the respondents strongly agree with the point of view just presented among the remaining students. Those precious experiences can come from many things such as experiencing a comfortable life in a modern country, experiencing services that are not available, or very rare in Vietnam, such as means of transportation, entertainment, etc. For many students who are passionate about foreign films, this is an opportunity for them to truly experience the life of an international student as fully and as excitingly as possible.

Usually, students take an English course abroad, what they expect is to learn English and many other things. These values can come from their classroom, such as teamwork skills, presentation, persuasion, critical thinking, etc. Besides, students learn more about the culture, people, tourism, and many other areas of the host country. This brings many incredible benefits to learners, especially for students oriented to work in a multinational environment, work abroad, or even return to the country in which the student joined this program to work. Understanding and agreeing with this, up to 98% of the students asked to agree with the above point of view.

The benefits of short-term English study abroad are pretty obvious. However, coexisting with it are difficulties and challenges. Within the framework of this research, the challenges that students will face will be explored and presented in the following section.

Table 2. Common challenges that students face when taking English courses abroad

Challenge	Number of students selected	Percentage
(1) Program costs are high	49	98
(2) Lack of confidence in the ability to use English	38	76
(3) Participants must get out of their "safe zone"	31	62
(4) Participants must be away from loved ones for quite a long time	27	54
(5) Participants may face safety risks	26	52

The results from the table above show that the program's cost is the leading factor influencing learners' decision whether they can participate in the program or not, with 98% of students asked to choose this category. According to Chelliah et al. (2019), the cost of study abroad programs is one of the main factors affecting the decision to participate in the program and learners' satisfaction when studying abroad. It is understandable that when studying English in developed countries, the cost that learners have to pay is much or much higher. In the case of FPT University students, they can complete ETR501 in Vietnam with a tuition fee of about 550 USD, but if they apply for the program in Australia, this fee will double. In addition, students need to pay many other high fees, such as accommodation, transportation, airfare, other living expenses, etc.

The second in the list of the most common challenges that students often face when studying English abroad is a lack of confidence in their ability to use a foreign language even though they have previously studied English pretty much. This challenge accounts for 76%. This difficulty can be explained by the past's lack of experience in learning English. In fact, many Vietnamese students may have studied English for quite a long time, 5, 10, even 15 years before that. However, when it comes to using it as a part of life because students have to live abroad for a certain period, it immediately becomes an invisible barrier. According to Nguyen (2019), in Vietnam, many people learn English to pass exams only, not to learn to use it, which explains the challenge mentioned above. Therefore, at FPT University, many efforts have been made to increase the practical use of English, but it is pretty difficult for all students to learn English in a relatively limited period, from 2 to 10 months.

The "safe zone" concept in this study is understood as familiar, comfortable, complete, and convenient for students. Many students face great difficulties when entering university; when this comfort zone gradually disappears, students need to be strong

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enough to face more challenges, difficulties, and changes. That level of difficulty and novelty will become higher when students leave Vietnam and study in a foreign country. For that reason, in this survey, up to 64% of students surveyed chose this as one of the major challenges they face when studying abroad. In particular, in today's developed society, more and more attention is paid to learning, students become more and more cared for and pampered to focus on studying alone. This has many consequences, and not wanting to change for the better is one of the significant challenges associated with this challenge- Participants must get out of their "safe zone".

"Participants must be away from loved ones for quite a long time" was the next challenge chosen by 27 students, with a rate of 54%. Through the study of related documents and in-depth discussions with these 50 students, the author concluded that in the context of Vietnamese culture, community cohesion had a profound impact on the lives of Vietnamese people, including students. Leaving family, friends, or lovers to study abroad is quite tricky and will make them lose their morale and concentration in studying (Ngoc, 2014). Along with this topic, homesickness has also been mentioned by Hendrickson and Aune (2011) in their research. Homesickness is one of the significant difficulties that international students face.

A final common challenge here is the safety risks that students may face while participating in the program. There are 52% of students choose this because when studying abroad, there are many potential risks that can happen to them. Such safety risks may occur due to a lack of adequate understanding of the laws, cultures, religions, and regulations of the host country, land, and school where students come. Moreover, even if students have made careful preparations about the above, the safety risk cannot be eliminated because there are many differences in laws, cultures, customs, etc., between countries and continents. In political instability, natural disasters or epidemics such as the COVID-19 pandemic, being unsafe or stuck in a foreign country, and being unable to return home are risks students may encounter while studying abroad for a short time.

V. CONCLUSIONS AND RECOMMENDATIONS

Regardless of the great benefits of a short-term study abroad program to learners, the above challenges need to be considered thoroughly. Then we offer solutions to improve the program. Because if we do not have these adjustments, the program's quality will still be stagnant, even in the context of the epidemic and political instability, and natural disasters in many places, the program will be reduced in terms of quality, and it cannot be ruled out that the program is canceled. In this study, the author has proposed several options that can improve the above challenges.

As mentioned above, the biggest problem is the cost difficulty; the disparity in prices in developed countries makes many students want, but they cannot participate in the program. Therefore, universities should consider adjusting fees, such as tuition fees, institution fees, accommodation fees, etc., at a reasonable cost. In the best case, these fees should not differ too much from studying in Vietnam; this would be a practical and effective measure in this regard. The school can also apply many forms such as tuition support free or reduced tuition for students participating in the program. In addition, schools can also support the cost of air tickets, accommodation, and even full scholarships for excellent students. Like some other exceptions when studying at the school, the University may also apply a scholarship or loan policy to provide financial support to students who enroll in the program. If these financial difficulties are removed, the student's decision to join the program will undoubtedly become a lot easier.

Next is the problem of increasing confidence in students, especially confidence in using English with foreigners and in an overseas environment. Educators need to have effective, practical, and appropriate measures so that students can cultivate this confidence right from the first days of learning English. It will be tricky for universities when the English learner they accept is now a student, but it is not easy. Senior and experienced professionals in English teaching need to pay more attention to the practicality of using this language, not just teaching so that learners can pass exams only.

It is not only the school's duty, but the family also needs to join hands in encouraging and facilitating students to step out of their "safe zone" as soon as possible. It is not only convenient for students to boldly participate in short-term study abroad programs such as studying English, but it also opens a new path ahead - the path of young, mature, and enthusiastic people. , dare to challenge and accept failure to get better every day. Related to this, parents who are overly protective of their children need to give more consideration to training their children to lead an independent life, have the right to self-determination, and take responsibility for themselves - from the minor things in everyday life to choosing the essential things in personal life. With this approach, the fourth challenge mentioned above is also solved.

Most risks are unintended and intended. However, in organizing the program, the organizers can also take many actions to minimize the possible damage caused by such risks. For example, it is necessary to be serious about training and supplementing with important information about law, politics, religion, culture, etc., students before sending them to a specific country. In organizing the program, it is necessary to arrange the school's personnel and coordinate with partners to follow up and support students in urgent cases. Enhance coordination among stakeholders so that information is complete and timely. In addition, the

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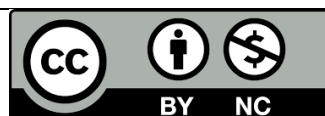
requirements for buying insurance for the trip or vaccination for program participants should also be paid attention to. In addition, there are many other specific measures that schools need to prepare and implement for specific programs in different countries carefully.

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Effectiveness and the Ways of Using Pedagogical Innovative Technologies in Teaching Process



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ABSTRACT: Innovation is the process of making new changes in various fields of activity, as well as in the field of education and industry. The result of such changes is news. Any innovation is inevitable, which is formed in the logic of changes and development in society. The essence of innovation is to the tools and methods to achieve new results, obtain them, to overcome traditional or regular elements of traditional activities. The transition of enterprises and organizations of the national economy (including the education) has further strengthened these all conflicts, but the most painful situation is the need to restore the minds of these employees.

KEYWORDS: Cognitive Competence, Innovative Methods, Creative Teaching, Internet Resources, Education and Training.

INTRODUCTION

Technical and organizational issues will come on first in educational institutions and goes around the training of students and consumers of technologists and educational services. At the same time, the lack of the lack of two main issues (the teacher renounces and not to them) to introduce news for the educational process in the educational process. Organizations operating in uncertainty of educational institutions, ie it may not be possible to assess the probability of potential results in exact figures. Such organizations include socio-cultural, political and science. The knowledge of the social and psychological-pedagogical aspects of innovations in these areas is relevant, as ignoring them may compromise the most valuable news. Any news leads to technical and psychological consequences.

THE MAIN PART

Traditionally, innovations are considered as a completely positive accident in the organization's life: historical and net daily experience shows that it is far from this work. All innovations may not be good for people, even if their purpose is good. Based on the above, psychological and pedagogical factors in the implementation of innovations is clear. Inquiries of innovations (innovators, organizers) should support the psychological support of innovations to eliminate obstacles with the least losses.

We can find many classifications of innovations in publications. We focus on the projected classified classification in education.

- 1) technical and technological (new manufacturing facilities and new technologies); employees of organizations do not expect negative results from these news;
- 2) organizational-management (new organizational structures and methods management methods, management of management decisions);
- 3) socio-economic (new financial incentives, salary systems).

The last four types of innovations lead to a negative reaction between employees and is the most difficult to achieve effective changes in people's actions, the presence of stability, healthy conservatism and the presence of life and prefencial stereotypes encourages all of us to be careful and prone to fear.

Problem Provider, Novage, Entreprensiuous, Developer, Expert, Organizer, Organizer, User, the user affects many employees of each organization, interests. This role-wheeling position set depends on the content and scope of innovations and is rarely found in manufacturing. There are two mandatory positions: organizer and user. In education, many positions are often qualified to be a teacher-innovator.

Often, the functional position of innovative positions and employees may not be compatible. Typically, scientists should be the head of the organization and its behavior should reflect innovative behavior standards, the desire to give the freedom of

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movement, initiatives. The manager's innovative behavior is the motivator's motivator's motivates in the most important personnel.

The modern educational space consists of two types of pedagogical processes –Innovative and traditional. Pedagogical innovation - theoretical reasonable, is fulfilled and practiced, it is carried out three levels: macro level, meso-level, and micro levels. Innovations at the macro rate affects the changes in the entire education system and lead to a change in its paradigm. MESOz level is aimed at changes in the educational environment of the region, in specific educational institutions. At the micro level, we talk mainly about creating new educational institutions based on new conceptual approaches. Today, there are four types of educational institutions in Uzbekistan: elite, opportunistic, experimental and traditional. Innovations aimed at creating new content for a separate course and courses of innovations (for example, environmental or humanitarian); Or develop new methods of building the educational process; Development of new technologies, new forms and methods of teaching.

Education innovations develop in five stages at any level.

The decision on the need to excite the first rounds and the need to introduce certain types of news. Initialization may concern with internal motivation of the head of the organization, but may result from external or internal pressure: changes and processes for order from ministry, ordering, organization for a new specialist, organization. Typically, innovative strategy and analytical work on its implementation should be carried out by the head by the head of the rector, Vice-Rector and Dean (Director, the head teacher). Innovation initiative in practice is often from the above-mentioned teacher - not from above.

The second phase and theoretical, ie the development and development of innovations on the basis of psychological and pedagogical analysis, the development of the innovative process and was its negative and positive consequences (economic, legal, etc.). This stage is the hardest, because pedagogical reflection and ability to think "other pedagogical truth" is:

- ❖ Knowing psychological and pedagogical theory;
- ❖ Ability to make your ideas into a single understanding;
- ❖ Librating the need for or inevitable news;
- ❖ Identification of factors that promote the introduction of news.

This stage also includes the provision of planned innovation information. In the second stage, cautious work requires success in the stage of the introduction of innovations in the pedagogical process.

New structures promoting the development of third-round-organizational and practical and practical and practical and practical and practical and practical and practical and practical-innate. These structures should be self-sufficient and independent. At this stage, it is important to find supporters of innovative idols, especially in the organization, through the influential and reputable people in the organization. In addition, the relationship of many other employees to innovations should be patient among these innovations. This stage of the innovative process ends with many members of the organization to meet the needs of the organization and create a favorable emotional and motivational background.

The fourth step is to generalize and analyze the analytical model. At this stage, it is necessary to understand how the innovative process is carried out; The state of the educational institution should be associated with a subject of a subject that must be achieved by a whole incident (or teaching of a particular science). If the game is not held, you must find an answer to the question: Why?

The fifth phase is done, it can be tested, and then complete. At this stage, success depends on three factors:from the material and technical base of the educational institution or the environment

Innovation is mostly done in relatively small communities, where to innovations make psychological manufacture of psychological cooking and awaken people's enthusiasm and confidence here.

Qualification and education. It is important to know the management, knowledge and foreign languages of the leader's progressive kind. These features are associated with the initiators and implementers of the innovative process, and this role should often perform the heads of organization. R. L. According to Krijevsky, as for the characteristics of the performers to successfully implement innovation policy, the following factors are important:

- a) Availability of a special system of training and retraining of employees;
- b) Information relations and awareness awareness, ie adequate information about them for innovation;
- c) Innovation, the attitude of employees to innovations depends in many ways on the organizers of innovations.

According to our observations, the main obstacle to the introduction of educational innovations in the practice of university practice is the quality of pedagogical staff, the level of professionalism. For example, new pedagogical technologies require the university teacher (except for professional competence on its subject) to have pedagogical skills.

A list of new pedagogical knowledge and skills required by the teacher of the Education Technologies Development is as follows:

- ✓ Ability to diagnose for education;

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- ✓ Exigting on the topic and its scientific basis, systematic knowledge;
- ✓ The ability to restore the educational material from inductive presentation, but the whole theme is the ability to restore the whole theme to the logic of the presentation of inductive detatory issues;
- ✓ Equipment for the professional performance of the future specialist in the educational process (in his goals, content, learning forms, methods and tools);
- ✓ Except for the workshop, business environment, brainstorm and others preparatory work;
- ✓ fluency fluenting methods of teaching;
- ✓ Ability to provide a favorable psychological climate, teacher and student co-operation.

In the study of N.A.Ilyina, the specific attitude of employees to innovation consists of three components: cognitive, emotional and behavior. It sets five types of attitudes to innovations: active, prosifucous, positive, neutral, passive-negative and active.

LITERATURE REVIEW

Social psychologists divide people into the following types according to the news. People who are determined by the permanent aspersion of opportunities for improving the opportunities to improve the production and management; Develops technological, organizational and other innovations, make initiative proposals and achieve them.

Psychological barriers in innovation. The actions, expectations and emotional experience of an employee who conceal or clearly illustrate negative socio-psychological situations as a result of the psychological barrier. According to forms of manifestation, psychological barriers can be divided into passive, active and very (open sabotage). The psychological barrier is a developing person, as its parameters (nature and forms) are changed at different stages of innovations, depending on the type of innovation and varies to various categories of employees.

R. L. Krichevsky, K. Referring to Davis, the reasons for the resisting organizational innovations of employees may be three different: economic, personal and social. As we can see, teachers are basically afraid of innovation, as they lead to acceleration and retraining of the case; They can reduce importance and change the main role in the educational process; Improads and creativity in the teacher's activity limits. Teachers are among the social reasons for the reconections:

1. The desire to maintain normal social ties, and therefore, their status (40%);
2. I am afraid to change the functional functions of innovation and reduce the work of work (30%);
3. Protests of irrelevantness of the role of personal participation and insignificance of innovation (20%);
4. The fact that innovations are beneficial not to the community, but not employee

The experience of introducing new technologies over the past 3 years shows that the educational institution is highly related to the socio-cultural context. The specifics of the introduction of innovative processes in the department. According to our observations, this is:

- The direction of many employees is not successful, but not to fail;
- Fear of dangers and hardship;
- There is a low level of claims;
- Any initiative is punishable;
- There is no interest in self-development;
- In particular, general and low sympathy is a rough contact Culture;
- Lack of communication skills;
- Low lower ability to comply with and improvise steroids;
- Failure to understand their professional purpose (their teaching function) and resulting in the lack of self-activation at work;
- Failure to display a multifaceting and as a result, after 10-15 years of doctrine, emotionally burn.

These components define the teacher's professional affairs (we call acmenological invirations after psychologists after psychologists), we think the optimal creative potential and high productivity of the teacher's work. The desire for the collaboration of creative and research methods of creative career is an Amitology Case Position (Promoting the actology and prosperity of acts and prosperity).

If the vocational direction of the teacher is based on social actions, technique and operations of modern traditions, the best traditions of modern professional culture (not a boring necessity or random destinate), This situation gathers the interests of society and the student. This situation can be considered optimal because it stimulates and catalyzes the highest productivity of vocational activity and turns it towards positive news.

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The Athletic Component is a result of complex subjective-objective formation, some of the deepest mental characteristics of the national character, which is a group of personality qualities that determine the development of professional.

Practical reform of educational systems, i.e. education and upbringing in all types of educational institutions on the basis of relevant programs. It should be noted that the introduction of any pedagogical news is the innovative activity of the teacher not to reform education. The structure of the innovative activity can be described in various aspects: axisology, reflection-activity, socio-psychological, etc.

A symptological approach to innovative activities reveals it in terms of teaching values. The teacher assigns universal cultural and pedagogical values to the extent that allows the level of development and inner culture of self-awareness of self-awareness and inner understanding. The professional mind has an internal basis, which allows the teacher to self-determine about the introduction of news to the education process.

The innovative model should be developed based on the model of social partnerships created in foreign pedagogical innovations. The combination of these two sources L. S. Podymova allowed to offer such a model of the teacher, where there was a social phenomenon for all elements of the innovative process (see the Figure number 1).

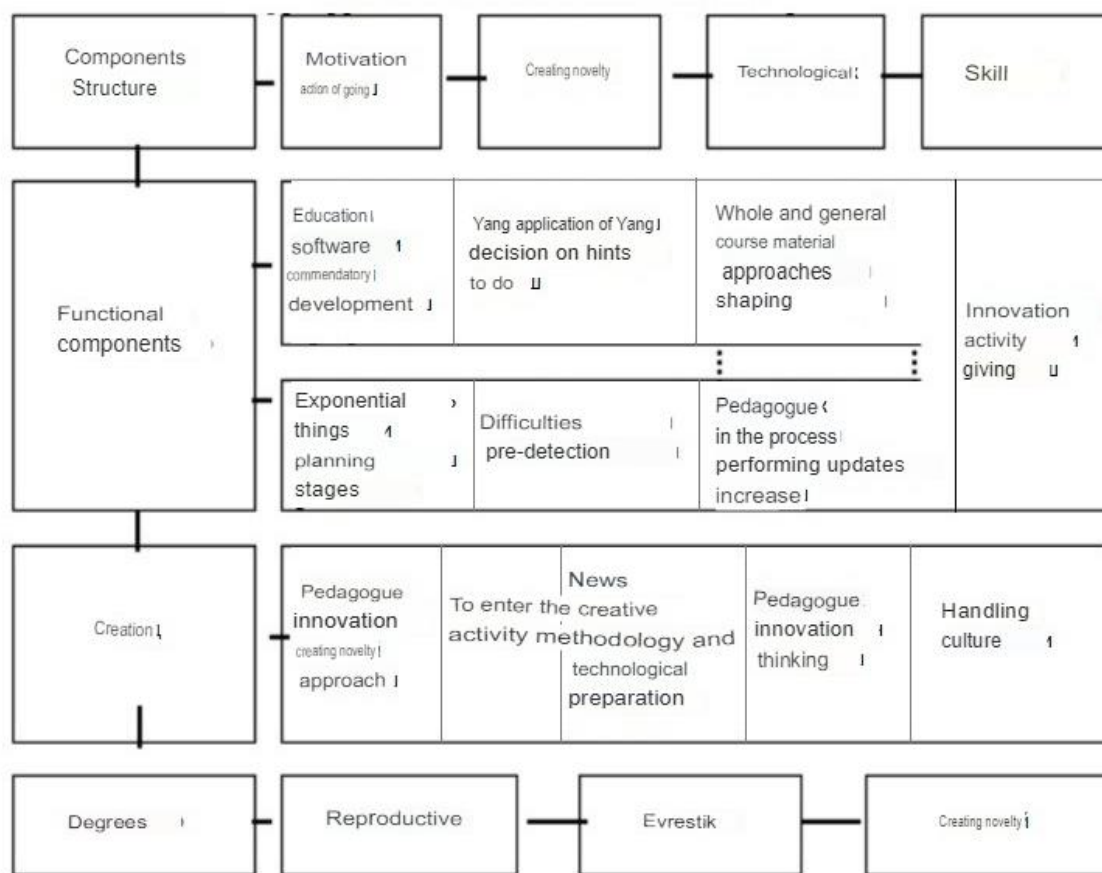


Figure 1. The innovative process model of the teacher

Learning in a broader study-human experience accumulated by civilization. Preparation of young people for active work depends on the current need of society. Vocational training is conditionally conditionally conditionally established to the needs of the state and society for qualified specialists. The state forms a social order for the training of specialists and defines them with requirements. These requirements are made in the learning process.

Didactic (learning theory), studying the essence of the study, insisting its clear social and pedagogical character. The multidimensional nature of the educational process is determined by the movement of social, pedagogical and individual legislation. The social level includes the general laws and mechanisms and mechanisms of social development determining the purposes, content, content, organization and methodology of the education. Pedagogical molds reflect the structure of learning as a bilateral active process of teachers and students to master appropriate knowledge, skills, and formate their professional qualities. The player's molds of the student at the individual and the player's molds with macro-features are a person, as manifested as the subject, as a job.

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Modern professional work is complex and multifaceted. To ensure successful implementation of it, knowledge of technique and methods of use is required to develop strong practical skills and skills and skills and intellectual, willtell, and other qualities. The main component of the case is vocational activity. Given the short time for students, the teaching process should be on the one hand, fierce and speaker, and in the other side, while the laws of human psychiak should be in line with the possibilities. The activity in the educational process has a teaching and learning feature. Therefore, the effectiveness of teaching is largely determined by the ability of teachers to organize the learning process in accordance with the basic laws of the teaching. The concepts of various pedagogy (didactic) of teaching them will also be developed.

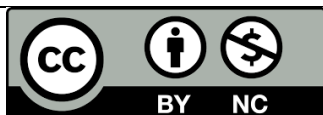
They formed an integrated organizational and pedagogical basis for educating students. In particular, the organizational and pedagogical bases of professionals proposed by many researchers is the structure of theoretical and methodological regulations, which is the basis of professional and pedagogical approaches and staff; Psychological-pedagogical bases, including the conditions and factors of the conceptual and formal-mathematical models of education, knowledge and practical activities, indicators and methods, effective professional cocoons. Organizational framework for the architecture of the optimal system of comprehensive and advanced training of specialists, the principles, conditions and factors, etc.

CONCLUSION

The general consideration of all pedagogical concepts, their content and direction, determines the ultimate purpose of teaching as a mastering of the knowledge and practical readiness system required for successful activities. Therefore, it is important to know the essence, content and characteristics of the basic concept of the main concept of education, to know their strengths and weaknesses, and to organize the learning process, given it. Following the basic rules of the concept of a certain concept, the teacher plans its activities and mastery of students' teaching materials. At the same time, it uses the most effective forms, tools and methods of training. Regular monitoring and analysis of exercise results allow you to quickly implement the necessary adjustments in the activities of the teacher and the trainers.

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Clinical & Biochemical Profile of Covid 19 Patients With and Without Co Morbidities



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ABSTRACT: The pandemic outbreak of novel corona virus disease (COVID-19) was initially noticed in a seafood market in Wuhan city in China in mid-December, 2019, has spreaded to 215 countries worldwide. 2020 January 7th and was temporally named 2019-nCoV.

Corona virus belongs to a large family of virus that causes illness ranging from the common cold to more severe disease. A novel corona virus is a new strain that has not been previously identified in humans on January 30th 2020 declared the novel corona virus outbreak of public health emergency of international concern (PHEIC). At that time there was 98 cases and no death in 18 countries outside China.

The official name COVID-19 and SARS-CoV-2 was issued by the WHO on 11th February 2020. Viruses are named based on their genetic structure to facilitate the development of diagnostic test, vaccine and medium. Virologist and the wider scientific committee do this work, so viruses are named by the international committee on taxonomy of viruses.

A recent review of the survival of human corona virus on surface found large variability ranging from 2 hours to 9 days. The survival time depends on number of factors, including the type of surface, temperature, relative humidity and specific strain of viruses.

March 11th 2020, the rapid increase in the number of cases outside China. 118,000 cases had been reported in 114 countries and 4,291 deaths had been reported.

Middle of the March 2020 corona outbreak could be characterized by "Pandemic" reporting over 401,088 globally confirmed cases. As of 28th April 2020, 63% of global mortality from the virus.

The impact of the disease on the world has been staggering both from public health and economic perspective. We evaluated whether prior or active corona virus infection influenced hematological, biochemical and clinical parameters of such patients. But active corona fever resulted in higher hospitalization rate. Our data support the notion that SARS-CoV-2 and co-morbidity weather affects an important percentage of COVID-19 patients and leads to worse parameters, requiring greater attention from health authorities.

KEYWORDS: COVID, SARS-CoV-2 Infection, SARS-CoV-2 Infection with Comorbidities, hematological, Biochemical, Markers, ARDS, acute respiratory distress syndrome; SARS-CoV-2, corona virus disease CRP- C reactive protein; ICU, intensive care unit; PCT, procalcitonin.

INTRODUCTION

The severe acute respiratory syndrome corona virus-2 (SARS-CoV-2) quickly spread to several countries, infecting millions of people worldwide. Thereafter, the number of infected individuals from all countries continued to grow daily reaching day by day expressive figures.

Most (SARS-CoV-2) infective individuals are asymptomatic or present non-specific, flu-like symptoms, such as fever, headache, fatigue and dry cough. However, clinically conditions can rapidly progress to severe pneumonia and ultimately death, mainly in patients who present comorbidity such as obesity, type II DM, CVS, neurological disorders. Although research is happening at an overwhelming speed to biochemical, hematology data and day to day investigations for effective treatment.

The impact of this disease on the world has been staggering, both from the public health and economic perspectives. A worse scenario has been witnessed in South America. Specially in Brazil, Ecuador, Argentina, and Peru. Recently highest number of cases of COVID-19 in the region. It has been hypothesized that such countries possibly experienced an aggravated COVID-19 pandemic due

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to socioeconomic and health factors. Co- morbidity infection being mostly reported in endemic and various non- endemic countries.

Corona fever is an endemic disease, by continuous vector transmission in several tropical areas around the world. The covid-19 pandemic brought additional uncertainty to countries that already needed to deal with Co-morbidity of obesity, MI, CVS, Type II DM. The circulation of both viruses represents a major challenge for hospitals that will have to face difficulties in determining biochemical parameters to diagnosis due to overlapping symptoms between Co-morbidity and covid-19. The consequences of covid-19 and Co-morbidity disease misdiagnosis are relevant and may include ineffective patient management. The clinical consequences of SARS-CO-V-2 and Co-morbidity disease infection are still unknown. Justifying investigations in the theme and dose vigilance by health authorities. Data regarding patients hematological and biochemical parameters, as well as clinical outcomes, were collected and analyzed.

We detected that a significant percentage of Covid 19 patients presented by virus infection did not significantly influence clinical and laboratorial parameters, active SARS-CO-V-2 was associated with more frequent detectable lung alterations and hospitalization, our data may provide important information to health authorities to improve the identification and the management of these patients.

AIMS AND OBJECTIVES

We are planned of 300 patients aged 18 + years who were admitted to the hospital emergency department and Covid-19 ward, presenting 75 patients of Covid-19 and 25 patients of Covid 19 Co morbidity-obesity, Type II DM, COPD, RENAL FAILURE MYOCARDIAL INFRACTION CHIRROSIS OF LIVER symptoms and performed the patient sample to analysis for strategic management.

The medical history carefully examined the patients and then filled their medical record with proforma data regarding and clinical history of fever, cough, dyspnoea, fatigue, headache, sorethroat, chest pain, diarrhea, vomiting, anosmia and in appetite. Patient clinical follow-up was assesed on medical record and was to determine major clinical outcome such as investigations of biochemical parameters and hospitalization.

ANALYTICAL PARAMETERS:-

1. Complete urine analysis.
2. Complete Blood Hematological analysis.
3. Complete Blood Biochemical analysis.
4. Covid 19, Antigen, Antibody Rapid test.
5. Throat Swab – RT PCR.
6. CRP, Ferritin, D-dimer, IL6.
7. Electrophoresis – Hemoglobin
 - Protein
 - Lipid
 - CSF
8. USG - Abdomen.
9. ECG, ECHO. – Color Doppler
10. HRCT – Thorax
11. CT - Brain
12. MRI - Brain

MATERIALS AND METHODS

The Study was performed with a convenience sample of patient assessed in JNU Hospital and study was to be approve by Ethics committee of JNUIMSRC.

Covid-19 diagnosis was confirmed by Reverse transcription-polymerase chain reaction (RT-PCR) assay of nasopharyngeal swab sample. Viral RNA was extracted using the high pure viral nucleic acid version by the step are plus reactive PCR systems methods. Hematology blood sample were used to analyze by flow cytometry.

Biochemical samples were used to analyze by fully auto analyzer diagnostic equipment. Serology test were carried out the methods based on indirect ELISA technique, immune plates are coated with a mixture of purified viral antigen and probe using the patient serum. And all Radiological investigations by highly modular technique of the Radiological Equipments

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Seventy five covid 19 survivors' twenty five co-morbidity non survivors and biochemical markers are studied and have been reported this is descriptive study and the comparisons between the two are analyzed.

INCLUSION CRITERIA

Patients with a history of fever more than one week with cough, dyspnea, fatigue, sore throat, chest pain, diarrhea, vomiting, anosmia, agusia and inappetite. Patient clinical follow-up as assessed to medical records.

Blood samples were used to analyze hematological parameters by flow cytometry. Serum samples were characterized according to the liver profile, renal profile, lipid profile, diabetic profile, coagulation profile, cardiac markers, CRP, D-dimer, ferritin, ABG parameters, electrolyte analysis and urine complete analysis by equipment of Randox Imola Autoanalyzer and used high resolution computed tomography (HRCT) was used to assess patient lung condition and RT-PCR to identify corona virus infection and rapid antibody test for the scoring to corona virus infection.

All statistical analysis were performed quantitative data were submitted to analysis of frequently using procedure with subsequent chi-square analysis at 95 % confidence interval to assess whether clinical parameters would significantly varies between Covid-19 co morbidity infection and Covid-19 past fever positive. Quantitative data were normality test using and then submitted to detect difference between Covid-19 co morbidity infection and Covid-19 past fever group patient.

All subjects were evaluated and selected by detailed medical history and physical examination, each subject gave informed consent and the study was approved by institutional ethical and research committee.

PROFORMA STATUS

JNU University Institute of Medical Science and Research Center (Jaipur, Rajasthan)

DEPARTMENT OF BIOCHEMISTRY

Research topic: A study to utility for Biochemical Parameters in Covid 19 Patients versus COVID-19 comorbidity

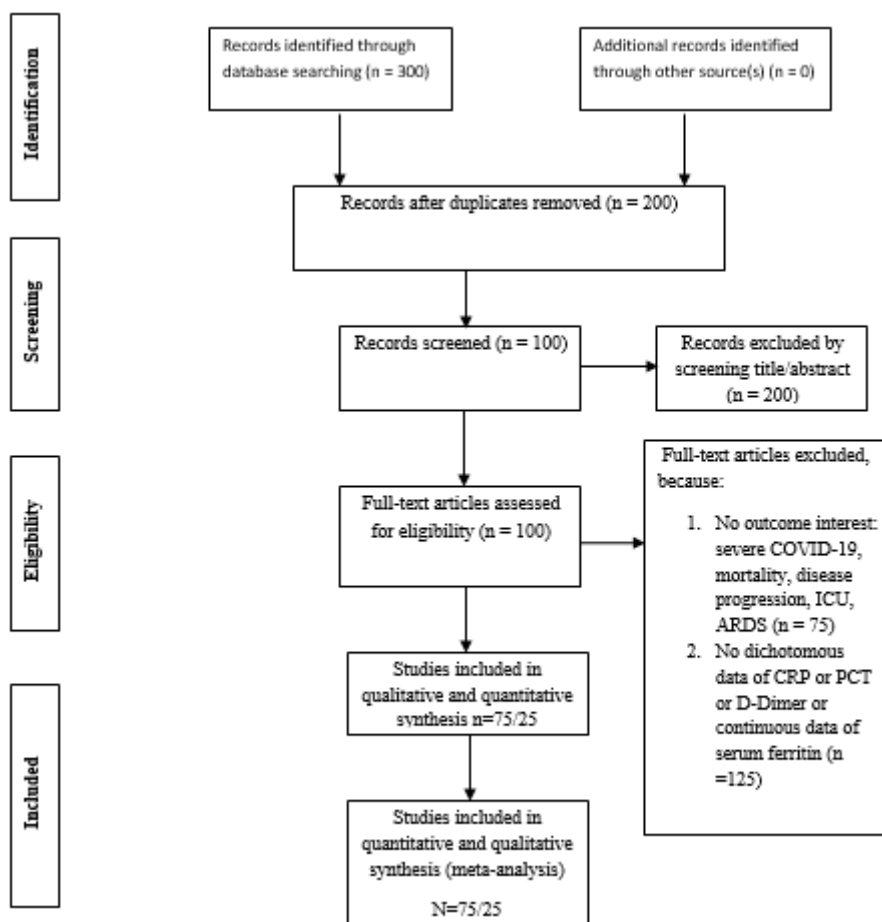
Investigator name: . , Dr. Shivasubramaniam M.D Dr.Minakshi M.D

1. Patient name/detail: Total 100 Patients
2. Age: 25-70 yrs old Sex: Male-40 Patients Female-60 Patients
3. Patient Id: Hospital Registration OP/IPD NUMBER
4. Weight: 32 kg – up to 90 kg various
5. Height: 132 cm. to 180 cm. various
6. BMI: 20 to up to 45 various
7. Religion: Hindu /Muslim/Sikh/Christian/Others
8. Area: Urban 60 Patients. Rural: 40 Patients
9. Tribal 10 Patients Non tribal: 90 Patients

10. Diet: Vegetarian 60 Patients Non Vegetarian: 40 Patients
11. Smokers 80 Patients Non Smokers: 40 Patients
12. Chewing habit: 80 Patients
13. Alcoholism: 40 Patients Non Alcoholism: 35 Patients
14. Medical History: Fever, Cough, Cold, Tiredness, Breathlessness, with Hypertension, Diabetics, Renal Failure, Alcoholic cirrhosis, Acid peptic disorders 60 Patients in Covid-19. Covid-19 only 40 Patients
15. Patient Medical Co-Morbidity Disease History. 25 Patients

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STUDY FLOW DIAGRAM



ARDS, acute respiratory distress syndrome; COVID-19, corona virus disease – CRP, C-reactive protein; ICU, intensive care unit; PCT, procalcitonin.

RESULTS

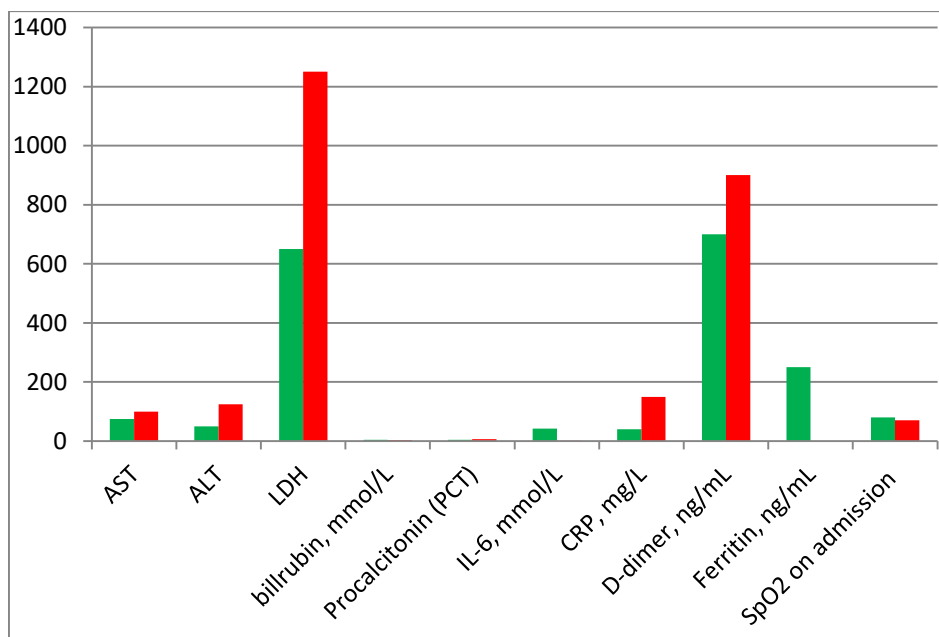
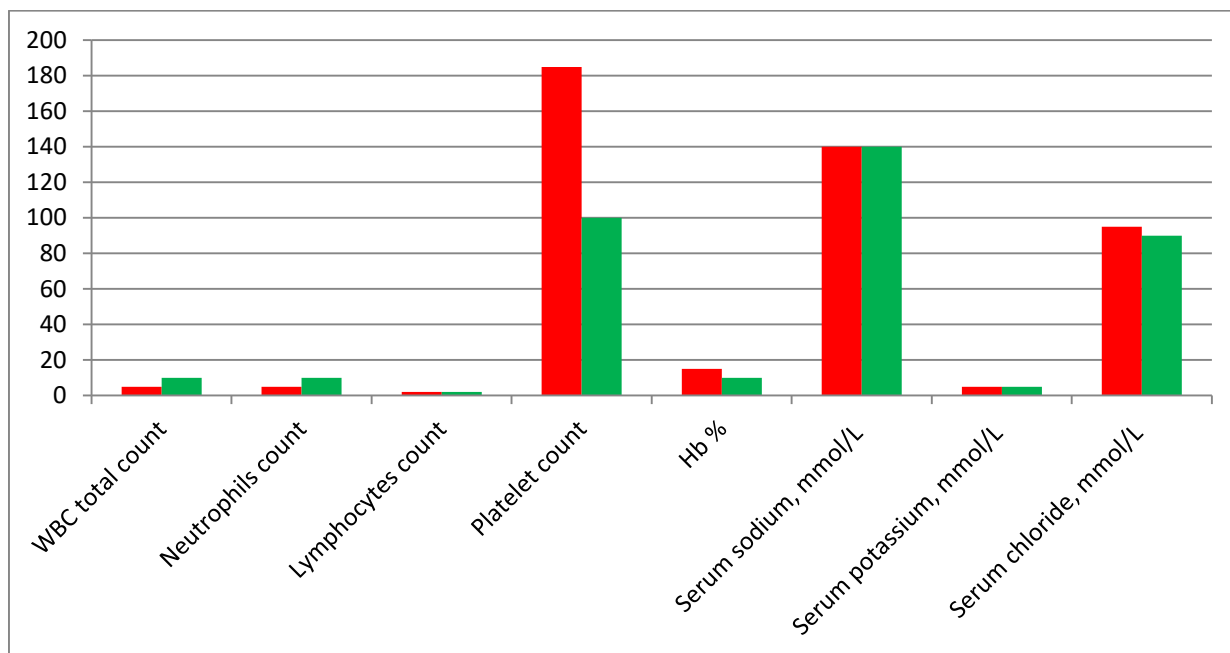
Table to describe the hematological and biochemical profile in COVID -19 and Co morbidity COVID -19:

Markers	COVID -19	Co Morbidity COVID -19	Sig
WBC total count (10 ⁹ /L)	4.8 ± 3.7	8.9 ± 6.0	Not Sig
Neutrophils count (10 ⁹ /L)	5.9 ± 1.5	8.4 ± 2.1	<0.001 Sig
Lymphocytes count (10 ⁹ /L)	2.4 ± 1.4	1.3 ± 0.5	Not Sig
Platelet count. (10 ⁹ /L)	184.07 ± 38.15	101.58 ± 70.27	<0.001 Sig
Hb %	12.81 ± 1.72	10.27 ± 1.29	Not Sig
Serum Sodium, mmol/L	138.21 ± 2.38	140.35 ± 7.39	Not Sig
Serum Potassium, mmol/L	4.12 ± 0.13	4.41 ± 0.92	Not Sig
Serum Chloride, mmol/L	96.71 ± 6.18	94.49 ± 7.8	Not Sig
AST U/L	68.38 ± 34.29	90.8 ± 114.98	Not Sig
ALT U/L	49.82 ± 38.92	121.38 ± 187.48	Not Sig
LDH U/L	620.28 ± 318.09	1216.16 ± 1129.29	<0.001 Sig
Direct billrubin, mmol/L	0.61 ± 1.23	0.79 ± 1.12	Not Sig
InDirect billrubin, mmol/L	0.41 ± 1.17	0.75 ± 1.39	Not Sig
TBIC, mmol/L	1.11 ± 1.22	1.45 ± 1.92	Not Sig
CRP, mg/L	39.29 ± 57.12	116.26 ± 91.9	<0.001 Sig
D-dimer, ng/mL	682.00 ± 114.19	892.13 ± 412.38	<0.001 Sig
Ferritin ng/mL	249.91 ± 38.15	1006.16 ± 112.39	<0.001 Sig
Procalcitonin	3.92 ± 6.99	2.90 ± 10.22	<0.01 Sig.
IL-6	42 ± 70	68 ± 1.10	<0.01 Sig.
SpO2 on admission	93.82 ± 6.39	86.28 ± 6.0	Not Sig

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Graph 1& 2: to describe the biochemical markers in COVID-19 and Co morbidity COVID-19.

Red – COVID-19 Co morbidity Green – COVID -19



DISCUSSION

This disease has a peculiar natural course. This starts off with mild symptoms and then suddenly the signs and symptoms blows out of proportion and eventually is very hard to treat. So identification of the stage is very important so that the treating doctor gets a chance to effectively treat the patient.⁸ Some of the reports have already marked the importance of the hematological and biochemical markers to identify the prognosis of the disease^{4,9} No such study has been done in the present population and this is one such sincere effort, some study has also reported the importance of inflammatory markers in the patients, C-reactive protein (CRP) is one such, others like erythrocyte sedimentation rate (ESR), and interleukin-6 are also extensively studied.³ Likewise, another work reported lymphocytopenia, high blood sugar, gamma-glutamyl transerees (GGT), high lactate dehydrogenises (LDH) in more COVID-19 patients.¹⁰ Further, laboratory findings of 77 COVID-19 deaths and 150 COVID-19 patients also demonstrated an increase in urea, cardiac troponin, creatine kinase, D-dimer, C-reactive protein (CRP), lactate dehydrogenises (LDH), IL-6, and lower level of lactic acid levels and lymphocytes.^{11,12} Analysis of 100 cases of COVID-19 revealed a higher level of C-reactive protein, D-dimer, lactate dehydrogenises, serum amyloid, and lower level of albumin are directly associated with developing a

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critical illness.⁹ The hematological and biochemical markers have been studied and this study successfully proves the difference. This can be used as a prognostic tool. Majority of the study has been done in the east and none of them in this region. The pandemic is still not over and this study is one novel effort to find the difference so as to help the practicing physician to diagnose the severity earlier and be helpful in the treatment of the disease. This meta-analysis showed that elevated serum CRP, PCT, D-dimer, and serum ferritin levels were associated with an increased composite poor outcome that comprise mortality, severe COVID-19 WARDS, and the need for ICU care in patients with COVID-19. The effect estimate was not significance modified by gender, age, cardiovascular disease, diabetes, and COPD.

In the systemic hyper inflammation phase of COVID-19 proposed there significant elevation of inflammatory cytokines and biomarkers, such as interleukin (IL)-2, IL-6 granulocyte-colony stimulating factor, macrophage inflammatory protein 1- α , tumor necrosis factor (TNF- α), CRP, ferritin, PCT, and D-dimer. This stage consists of the most severe manifestation cytokine storm, in which excessive hyper inflammation may lead to cardiopulmonary collapse or Multi-organ failure.^{35,36}

CRP is an acute phase inflammatory protein produced by the liver that may be elevated in several conditions, such as inflammation, cardiovascular disease, and infection.³⁷ In our meta-analysis studies, an elevated CRP was associated with severe COVID-19, the need for ICU care, but not mortality. Although there is no general agreement on a cutoff point to determining the severity of COVID-19, the majority of the studies used a ≥ 10 mg/L cutoff. Our SROC analysis showed the diagnostic value of serum CRP > 10 mg/L for a composite poor outcome in COVID-19 (51% sensitivity, 88% specificity, an LR + of 4.1 and an LR - of 0.5). Previous studies that attempted to predict mortality in sepsis by the presence of an elevated serum CRP were inconclusive. A study showed that an elevated serum CRP level was associated with a 30-day mortality rate,³⁸ while other studies showed otherwise.³⁹⁻⁴¹ These inconsistencies might be caused by the different cutoff value used. In the study by Koozi et al., the cutoff value for an elevated serum CRP was > 1000 mg/L, while in the study by Ryoo et al., the cutoff point of ≥ 140 mg/L was used.⁴¹ Liu et al. proposed cutoff value of ≥ 41.8 mg/L to predict severe COVID-19.⁴² In our analysis, the cutoff values of serum CRP varied widely, with the lowest and highest values being > 3 mg/L and > 100 mg/L, respectively these findings reflected the paramount need for pursuing the optimal serum CRP cut off value for COVID-19 Prognostication. The time period for serum CRP measurement was critical in light of timely manner of serum CRP increment, which culminates 72 h after the initial insults.^{37,41} Desj value in predicting a poor outcome in COVID-19, it should be noted that various factors could affect serum CRP levels, including age, gender, smoking status, weight, lipid levels, blood pressure, and injury.³⁷ These factors should be taken into account while interpreting the serum CRP level. In addition, recent evidence has shown that serum CRP level could also be used in monitoring the progression and improvement of patients with COVID-19.⁴³

A peptide precursor of the hormone calcitonin, PCT, has been widely investigated as a promising biomarker for the initial investigation of a bacterial infection.⁴⁴ An elevated serum PCT is often in patients with sepsis and septic shock.³⁹ While it is still controversial whether PCT can accurately distinguish bacterial or viral pneumonia,⁴⁵ it was found that PCT-guided therapy in acute respiratory infections reduces the antibiotic exposure and side effects, and improves the survival rate.⁴⁶ Bacterial infections trigger extrathyroidal synthesis of PCT, which is actively maintained by elevated values of IL-6, IL-1 β , and TNF- α , while viral infections hinder PCT production due to interferon- γ .⁴⁷ This explains why serum PCT concentrations remain normal in uncomplicated cases of COVID-19 at inflated values may indicate bacterial co-infection in severe cases.⁴⁸ In this meta-analysis, we found that an elevated serum PCT was associated with mortality and severe COVID-19. Our SROC analysis showed the diagnostic value of serum PCT ≥ 0.5 mg/L for a composite poor outcome in COVID-19. (88% sensitivity, 68% specificity, LR+2.7 and LR-0.2).

In our study, we also found that an elevated D-dimer was associated with an increased composite outcome, especially mortality and severe COVID-19. This finding supports the hypothesis that acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infection could induce the dysfunction of the hemostatic system, leading to a hypercoagulable state, a condition which we commonly encounter in sepsis.^{49,50} Recent evidence of lung pathology dissection has shown occlusion and micro-thrombus formation in pulmonary small vessels of patients critically ill with COVID-19.⁵¹ However, the effect of elevated serum D-dimer level is multifactorial and the optimal cutoff value of elevated D-dimer in patients with COVID-19 remains to be established. It is clear that COVID-19-associated coagulopathy warrants distinct emphasis and special treatment. According to the International Society of Thrombosis and Hemostasis (ISTH) guideline, a markedly elevated serum D-dimer level (which is still poorly defined as a three-to four-fold increase) implies an increased thrombin production. Patients with COVID-19 with markedly elevated D-dimer levels may require hospitalization, despite their severe clinical presentation.⁵² In the absence of contraindications, a prophylactic dose of an anticoagulant is recommended for all hospitalized patients with COVID-19.

Along with other biomarkers included in this study, we also found that a higher serum ferritin level is independently associated with ARDS, mortality, and severe COVID-19. This may lead to the presence of secondary hemophagocytic lymphohistiocytosis (sHLH) in COVID-19.⁷ sHLH is a condition of hyperinflammation characterized by a cytokine storm causing fatal multi-organ failure. This condition is most commonly triggered by viral infections,⁵⁴ which might lead to a hypothesis of SARS-CoV-2 inducing this

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hyperinflammatory syndrome. Despite the fact that some authors suggest using HScore to identify subgroups of patients that may benefit from immunosuppressive therapy still controversial whether or not this specific condition in severe COVID-19 needs to be treated. A recent systematic review by Veronese et al. including 542 patients reported conflicting evidence in 4 studies.⁵⁵ the authors concluded that the current evidence did not support the use of corticosteroids in COVID-19, but some findings suggested corticosteroids may reduce the mortality rate in COVID-19 cases aggravated with ARDS.

CONCLUSIONS

1) Virus is inside the body detects a virus has never seen and will throw everything against it. The body eliminate the virus but can cause sometimes deadly collateral damage through the body. The study included only people who were unvaccinated and had at least one risk factor for developing a severe case of Covid-19. The people who are older than 60, obese, Type II DM, CVS, RS, CNS, Abdominal Organ underlying disease, an immunocompromised from another condition like prophylactic vaccine is enough to be hospitalized.

2) Corona virus SARS –COV2 significantly reduces the risk of hospitalization and death in people who take it early in the course of their Covid-19. There was also less likely to die, reported within a month of treatment and now in those who received the medicine. All of the antiviral medicines available today, including remdesivir and the monoclonal antibodies are much more affected against Covid and cut risk of hospitalization and death by up to 85 % but this treatment cost almost higher than normal

3) The research, Study has conducted in numerous place sites around Rajasthan in Jaipur, JNUIMSRC became the results are promising to against corona virus and clinical parameters investigations is improve the identification and the management of the Covid 19 patients. (SARS-CO-V-2)

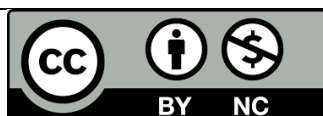
The hematological and biochemical markers may be used as prognostic markers in COVID-19 and Analysis showed that an elevated serum CRP, PCT, D-dimer IL6, and serum ferritin were associated with a composite poor outcome in patients with COVID-19.

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Perception of Climate Risks and Issues of Adoption of Resilient Technologies by Farmers in Togo



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SUMMARY: In this paper, we develop a theoretical model to simultaneously describe the adoption of improved seed technology and the climate risk perception capacity of farmers facing production risks and incomplete information about the new technology. The adoption condition is derived from the assumptions of upstream climate risk perception and downstream farmer risk aversion, and assuming that uncertainty can arise from two sources: the randomness of climatic conditions and the uncertainty of future returns associated with the use of the new technology. We estimate a reduced form of this model through the Heckman selection probit using a sample of 545 plots distributed in the five regions of Togo. The estimation procedure is developed in two steps. In the first step, we estimate the first four moments of the benefit distribution and in the second step, we incorporate these estimated moments into the model of technology adoption and climate risk perception. We find that risk plays a central role in farmers' decisions, first through the direct effect of its perception and second through sampling moments of the yield distribution in the adoption model.

KEY WORDS: Risk, perception, technological adoption.

I. INTRODUCTION

The negative effects of climate change on agricultural production in constituted geographic areas are documented and are of concern beyond the scientific community, to policy makers and even to populations increasingly exposed to climate hazards (Lokonon et al., 2019; Egbendewe-Mondjozo et al., 2017; Pilo, 2014). In the tropics and particularly in Africa, climate change is most often considered to be highly detrimental to livelihoods in the agricultural sector (Dinar *et al.*, 2008). Africa is subject to a highly variable and unpredictable climate. This weakens African agricultural systems that no longer respond to current climate pressures (Yegbemey *et al.*, 2014). Already, Kurukulasuriya *et al.* (2006) highlighted the continent's high vulnerability to climate change due to the high dependence of economies on agriculture and the limited adaptive capacities of populations.

A firm to ensure its growth in a continuous manner, seeks to use the best available technology or innovate taking into account the economic context (Suri 2011; Hailu *et al.* 2014). In a context marked by the law of diminishing returns, in order to cope with declining productivity, a firm must improve or change its production technology by the most productive or efficient one possible; this is the adoption of technological innovations. New technologies are more likely to be adopted in response to economic scarcity and opportunity (Hicks, 1932; Habakkuk, 1962; Allen, 2008; Acemoglu, 2010). Similarly, when the environment of the production system changes, it is necessary to adjust the production technology to accommodate this change (Easterling, 1996 and Sunding and Zilberman, 2001). Clearly, the motivation for any decision to adopt an agricultural technology lies in the desire to improve productive performance. The success of agricultural transformation worldwide has been largely attributed to improved agricultural technologies such as fertilizers, improved seeds, and soil and water conservation (Johnston and Kilby, 1975; Mellor, 1976; Gabre-Madhin and Johnston 2002). The adoption of these technologies offers opportunities to not only increase agricultural productivity and income (Feder et al., 1985), but also to protect against climate risks.

For developing countries, the contribution of improved technologies to agricultural productivity is well documented (Sunding and Zilberman, 2001; and Doss, 2006). The process of technological adjustment to can be affected by farmers' expectations of future climate change as well as by expected price changes.

Technology adjustment that occurs in response to environmental and market shocks has been widely studied and well documented in the literature (Lucas 1967; Caballero 1994; Hamermesh and Pfann 1996; Hall 2004; Lambert and Gong 2010). The existence of risks associated with the adoption of new technologies can reduce productive performance and delay farmers'

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response to these shocks. However, the response of farmers to environmental shocks such as climate change can affect the adjustment costs and risks of introducing new technologies in the technological adjustment process has received relatively little attention.

Indeed, the change in climate observed over the last thirty years, at the global level, is one of the major challenges of our time. It is characterized by the resurgence of extreme phenomena such as droughts and floods, rising temperatures, increased variability of rainfall and characteristics of agricultural seasons (IPCC, 2007). As early as the Rio de Janeiro summit in 1992, the international community recognized the reality of the danger, through the report by the British economist Nicolas Stern. Indeed, this report compares the future consequences of climate change to those of the first and second world wars and the 1929 crisis combined, and estimates the costs of this change at 5,500 billion euros and 5% of future GDP in the world if nothing is done. Climate change is therefore a major threat to the environment and agricultural development worldwide and especially in Africa. Thus, for Egbendewe *et al* (2016), adaptation measures must be rapidly designed to reduce the impact of climate change on food security, especially in countries located in the tropics. For the same authors, one way to address food insecurity issues besides the required emission reduction efforts may be through food trade between countries.

Thus, a rich literature is provided in the logic of climate change adaptation (Rashid *et al.*, 2008; Yesuf *et al.*, 2008 and Asfaw, 2013). Apata (2010) uses a multinomial model and a stochastic simulation model to show that adaptation measures have a significant impact on the agricultural productivity of Nigerian farmers. In the same vein, Dédehouanou (2016) showed that 84% of Nigerian smallholder farmers have adopted one or more strategies to cope with climate change (temperature, rainfall). If the importance of adaptation to climate change is perceived and clearly articulated, it must arguably be said that the ability to perceive change plays a driving role in the adaptation process. Adaptation to climate change is a process that initially requires producers to perceive that the climate has changed and then identify useful adaptations to implement (Mustapha *et al.*, 2012). This last aspect has attracted the attention of many. Gnanglè *et al* (2011) have shown that the capacity to adapt to climate change is strongly related to the capacity of a farmer to perceive it. Thus, the main question of this research is to know how Togolese farmers react to climate risks. These are: what determines their capacity to perceive climate risks and how do they take into account the endogenous risks related to the adoption of new technologies in their adaptation process to climate change?

The objective of this research is to analyze the decision to adopt innovative technologies by Togolese farmers in order to strengthen their resilience to climate change. Specifically, the aim is to analyze the capacity to perceive climate risks and their implication in the decision to adopt resilient technologies, and then to analyze the consideration of yield loss risks related to the adoption of new technologies in the process of adaptation to climate change by Togolese farmers. The contribution of this research is to simultaneously take into account the involvement of upstream and downstream risks in the process of adopting new agricultural technologies. Following this work, we will present session 1 titled material and method, then we will present in session 2 the results and discussions, then we will end with a conclusion.

II. MATERIAL AND METHOD

Our modeling of technology adoption choice through the capacity to perceive climate change is based on the work of Maddison (2007) and Gbetibouo (2009), which was taken up by Yegbemey *et al.* The consideration of endogenous risks is inspired by the work of Chavas (2003). To better understand the design, we will present the theoretical model on the determination of the factors of perception and adaptation and then expose the adapted empirical framework. We will close this session with the presentation of data and some descriptive statistics.

Theoretical model on the determination of factors of perception and adaptation.

Given that farm households in Togo and elsewhere in the developing world produce under conditions of uncertainty and large market imperfections, the study adopted an expected utility maximization framework. Production risk was represented by the stochastic term ϵ , whose distribution, $G(\cdot)$ was exogenous to the actions of the farm household. Since improved varieties are among the most important inputs in the agricultural production process of smallholders, the household production function was presented as:

$$q = f[h(\alpha)x_c, \mathbf{x}, \mathbf{I}, \epsilon]. \quad (1)$$

While taking risk aversion into account, if r and p represent input and output prices respectively, the problem of a risk averse household maximizing expected utility of gross income is:

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$$\begin{aligned} & \max_x E[U(\pi)] \\ & = \max_x \int_0^q [U(pf[X_s, X_f, X_0, \varepsilon] - r_f X_f - r_s X_s \\ & \quad - r_0 X_0)] dG(\varepsilon) \end{aligned} \quad (2)$$

Where $U(\cdot)$ is the Von Neumann-Morgenstern utility function. E is the expectation while ε captures all unobserved household heterogeneity such as unreported farm management capacity, land fertility, risk preferences and risk management measures, and the discount rate that could affect input use and farm productivity.

Since r and p are not random, the necessary first-order condition for the variable the improved seed was specified as:

$$E[r_f U'] = E \left\{ p \frac{\partial f[X_s, X_f, X_0, \varepsilon]}{\partial x_f} U' \right\} \quad (3)$$

And

$$\begin{aligned} & \frac{r_f}{p} \\ & = E \left\{ \frac{\partial f[X_s, X_f, X_0, \varepsilon]}{\partial x_f} \right\} \\ & \quad + \frac{\text{cov} \left[U', \frac{\partial f[X_s, X_f, X_0, \varepsilon]}{\partial x_f} \right]}{E[U']} \end{aligned} \quad (4)$$

where U' is the change in income utility due to a change in income. In other words $U' = \partial U(\omega) / \partial \omega$.

Because the new technology is more efficient, we expect risk-averse farmers who bear higher profit uncertainty to have a higher probability of adoption, in order to protect themselves from the risk of adverse weather conditions (Kebede *et al.* 1990; Foster & Rosenzweig 2010).

Now assume that future profit streams after adoption are not known with certainty because of either the lack of knowledge of the exact performance of the new irrigation technology, or the higher probability that the use of the technology is not appropriate for the actual conditions, or that the market does not offer the sales opportunities. In addition, there are sunk costs associated with purchasing the new technology (there is a fixed investment cost and some irreversibility in the decision). These arguments imply that additional information could have positive value (Dixit and Pindyck 1994). Farmers may prefer to delay adoption in order to obtain more information about the new device. Therefore, an additional premium may be part of the adoption condition. The farmer will adopt if:

$$E[U(\omega^i)] - E[U(\omega^0)] > VI \quad (5)$$

where $VI \geq 0$ represents the value of the new information to the representative farmer, which is expected to depend on the fixed cost of the investment, the level of uncertainty in using the new technology, and the existence of the market and the farmer's own characteristics.

Antle (1983; 1987) provides a flexible way to estimate equations 3 and 4 that requires only information on prices, input quantities, and other observable variables. The approach is equivalent to maximizing the expected utility of farm income over any input to maximizing a function of the moments of the distribution of ε . The moments themselves have X_s as arguments (Antle, 1983; 1987). We therefore calculated the first four moments of the stochastic production function and included them as covariates in the analysis of improved seed adoption decisions. The study hypothesized that a household's adoption decision on improved seed (IS) was intimately related to the ability to perceive climate risks. Both of these phenomena depended on factors such as plot characteristics (Pc), household characteristics (hc), agro-ecological characteristics (AEC) and other random factors simultaneously or not (Pender and Kerr, 1998; Shiferaw and Holden, 1999; Doss, 2007; Yesuf and Kohlin, 2008). The theoretical model of adoption decisions of improved rice varieties and fertilizers was therefore specified as follows:

$$SA_{ha} = f \left(\begin{matrix} Perc_i, p_f, L_{os}, A_{cm}, InfoM, \\ Pc, Mc, AEC, Cr, \mu_{SAR} \end{matrix} \right) \quad (6)$$

Equations 6 represent the observed binary variable that reflects the latent net benefit, SA; from adoption of improved seed varieties.

The econometric model adopted

The regression model in this study was inspired by recent work by Yegbemey *et al.* (2014) who studied adoption in relation to perception based on Logit and Probit models with the following general form:

$$SA_i = f(Z) \quad (7)$$

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Where SA_i and Z_i represent respectively the adaptation decision of producer i and a set of demographic and socio-economic characteristics of the same producer i .

Considering the assumption of the perception/adaptation link, the simplest way to integrate the producers' perception (P) in the previous model is to express it as:

$$SA_i = f(Z_i, Perc_i) \quad (8)$$

The specification of two separate models - an adoption model (equation 8) and a perception model (equation 9) - appears to be an alternative that would limit the estimation biases:

$$SA_i = f(Z_i) \quad (9)$$

$$Perc_i = f(Y_i) \quad (10)$$

Where Y_i represents a set of demographic and socioeconomic characteristics of the same producer i that could be the same or different from Z_i . This new formulation, while it somewhat eliminates the endogeneity bias associated with perception, does not take into account the initial assumption that the adoption of agricultural technologies in the face of stimuli, such as climate change, is only intelligible in terms of their conception of such change. According to Maddison (2007), perception is a prerequisite for adaptation. In other words, one must perceive before adapting. The problem is therefore no longer one of endogeneity, but rather of selection: adaptation if there is perception. Thus, as proposed by Maddison (2007) and Gbetibouo (2009), a selection model such as Heckman's Probit model allows for a better exploration of the adaptation decision of producers in relation to their perception. In doing so, the general model becomes:

$$SA_i = f(Z_i) \quad (11)$$

If and only if:

$$Perc_i = f(Y_i) \quad (12)$$

The form thus defined is based on two sub-models: the However, still in the light of the theoretical framework, output model or adaptation model whose dependent perception itself appears to be an endogenous variable variable is adoption (SA) and the selection model (a function of a number of characteristics specific to whose dependent variable is perception ($Perc$). the individual). Therefore, the estimation of equation 7 is subject to endogeneity bias. Under these conditions, Allowing for endogenous risk implies that the adoption condition in relation 5 requires that the following inequality holds:

$$E[U(\omega^1)] - E[U(\omega^0)] - VI > 0 \quad (13)$$

At the time of the survey, we observe farmers in a unique situation (adoption or non-adoption), so we cannot estimate this structural equation. Instead, we estimate a reduced form of this equation and focus on the impact of risk in explaining the adoption decision. First, to avoid specifying a functional form for the yield probability function (-), the risk distribution $G()$, and the farmer's risk preferences (i.e., the utility function $U(-)$), we use a moment approach that allows a flexible representation of production risk (Antle 1983, 1987; Antle and Goodger 1984). Production risk and thus uncertainty about profits are accounted for in the adoption model by using the sample moments of the profit distribution as explanatory variables for the farmers' decision. Our dataset has the great advantage of collecting information on farmers who had just adopted the new technology. Specifically, farmers were interviewed at the time the decision to adopt/not adopt was made. Thus, the profit function was not yet affected by the adoption decision and for this reason, profit moments can be assumed to be exogenous to the farmers' decision. Second, as explained earlier, there is an additional source of risk that arises from the uncertainty about future profit streams that is introduced into the production process by the use of the new equipment.

The cost of this uncertainty is represented by a premium (VI) in the above equation, indicating the value of seeking additional information. In our empirical model, the role of information on the adoption decision will be measured through the following proxy variables that determine the farmer's human capital: the education level of the household head, the collection of general information on active agriculture and, the number of extension visits. All three variables are assumed to be positively correlated with farmers' level of information about the new equipment. According to human capital theory, innovative capacity is closely related to these variables (Kihlstrom 1976), since these characteristics are associated with farmers' resource allocation skills (Nelson and Phelps 1966; Schultz 1972; Huffman 1977). Information gathering, whether or not it refers to the innovation itself, should improve resource allocation skills and increase the efficiency of adoption decisions. A farmer with a high level of resource allocation skills will make more accurate predictions of future yields and profitability and thus make more effective adoption decisions (Stigler 1961; Huffman 2001). Similarly, imperfect information about new technologies can lead to risks associated with adopting the innovation that can increase the possibility of making mistakes.

The estimation procedure consists of two steps. First, we compute the first four sample moments of each farmer's profit distribution, namely the mean, variance, skewness, and kurtosis coefficients. Second, we incorporate the estimated moments into

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a traditional discrete choice model, along with other farmers' characteristics and farmer information variables, to analyze how production risk and information affect the decision to adopt a technological innovation. The first four moments of the profit distribution are derived using a sequential estimation procedure (Kim and Chavas, 2003). In the first step, the return is regressed on the contemporaneous input variables to provide an estimate of the "average" effect. The model has the following general form:

$$\omega_i = \psi(x_{ci}, x_i, z_i, \beta) + u_i \quad (14)$$

Where $i = 1, \dots, N$ denotes the individual farmers in the sample, ω is the yield per hectare, x is the vector of variable inputs (labor, intermediate inputs), x_c is the seed used, z is the vector of additional variables, including farmer characteristics (age and additional farmer income unrelated to farming activities) and farmspecific characteristics (geographical location, and aridity). u is the usual independently distributed error term. Under expected profit maximization, the explanatory variables are assumed to be exogenous and thus ordinary least squares (OLS) estimation provides consistent and efficient estimates of the parameter vector. Then, the $j^{\text{ème}}$ central moment of return ($j=2, \dots, M$) conditional on input use is defined as:

$$\mu_j(.) = E\{[\omega(.) - \mu_1]^j\} \quad (15)$$

where μ_1 represents the mean or first moment of performance. Thus, the estimated errors of the mean effect regression $\hat{\mu} = \omega - \psi(x_{ci}, x_i, z_i, \beta)$ are estimates of the first moment of the earnings distribution. The estimated errors $\hat{\mu}$ are then squared and regressed on the same set of explanatory variables:

$$\hat{\mu}_i^2 = g(x_{ci}, x_i, z_i, \delta) + \tilde{u}_i \quad (16)$$

Applying OLS to this equation provides consistent estimates of the parameter vector and the predicted values $\hat{\mu}_i^2$ are consistent estimates of the second central moment of the earnings distribution (i.e., the variance) (Antle 1983). We follow the same procedure to estimate the third and fourth central moments, using the estimated errors raised to the power of three and four, respectively, as dependent variables in the model. The four estimated moments are then incorporated into a discrete model of technology adoption with structural and demographic characteristics of the farmers.

Recall that the farmer will choose to adopt modern technology if and only if:

$$Y_i^* \equiv E[U(\omega^i)] - E[U(\omega^0)] - VI > 0. \quad (17)$$

Y_i^* is an unobservable random index for each farmer that defines his or her propensity to adopt a new improved seed technology.

For estimation purposes, let us note

$$Y_{ji} = Z'_{ji}\alpha_j + m'_{ji}\alpha_j^m + [m \times K]'_{ji}\alpha_j^K + v_{ji} \quad (18)$$

The indirect utility of farmer i adopting at level j .

The vector z is a vector of regressors including all structural and demographic characteristics, m is the vector of the first four profit moments that introduce uncertainty into the model, and $[m \times k]$ denotes the vector containing the interactions between the four moments and the human capital variables. α is a vector of parameters to be estimated and v is the usual error term.

The estimated production risk factors were then incorporated into improved variety adoption models (Equation 11) that were estimated as selection probit to handle the simultaneity of technology adoption and climate risk perception decisions. A similar approach was used by Feder et al. (1985), Feder and Onchan (1987) and Yesuf and Kohlin (2008). The model was specified as follows:

$$SA_{ha} = f \left(\begin{matrix} p_f, L_{OS}, A_{cm}, InfoM, Pc, Mc, \\ AEC, Cr, m'_{ji}\alpha_j^m + [m \times K]'_{ji}\alpha_j^K \mu_{SAR} \end{matrix} \right) \quad (19)$$

If and only if :

$$Perc_i = f(Y_i) \quad (20)$$

Data and descriptive statistics.

This study will use data collected in the five (05) regions of Togo by the Direction des Statistiques Agricoles de l'Informatiques et de la Documentation (DSID). A total of 545 farmers were interviewed on their socioeconomic characteristics as well as on their plots and their farming practices. According to the analysis, men represent 72% against 28% of women. As for the level of education, the data reveal that 37% of the farmers have a primary level of education, i.e. 204, and 31% a secondary level (170 farmers). We record 91% of farmers who claim to be married, against 9%. Given the importance of training farmers in the mastery of agricultural practices, the study was interested in knowing whether farmers are actually trained in their profession, and 69% said they had received agricultural training on a sample of 546 producers. This compares with 31% of producers who had not received training. With regard to technical support from support and extension services, only 23% of producers receive this technical support.

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Belonging to a Production Organization strengthens networking and provides enormous benefits to member farmers. The analysis of the data reveals that more than half (56.3%) of the producers belong to a PO. In addition, 44% of the respondents have access to credit to finance their activities. And that most of the plots studied are not irrigated (about 93%).

Table 1. Explanatory variables considered

variable	Description	Expected signs	
		adoption	perception
male	Describes the gender of the respondent, this variable takes the value 1 if the respondent is male and 0 otherwise.	+	+
Age	This variable indicates the age of the respondent	+	+
Not educated	Indicates if the respondent is educated or not. It takes the value of 1 if he is not educated and 0 if he is.	-	-
primary	Indicates the level of education of the respondent, it takes the value 1 if the respondent has a primary level and 0 otherwise	+	+
bride	This variable indicates the marital status of the respondent mainly married and takes the value 1 if the respondent is married and 0 otherwise.	+	+
household size	Indicates the household size of the producer, it takes the value 1 if the household size is < 5 and 2 >= 5	+	+
agriculture	Indicates the main activity of the respondent, it takes the value 1 if the respondent is a farmer and 0 otherwise	+	+
land heritage	Indicates the level of land holdings. It is evaluated in ha.	+	+
Farming_experience	Describes the number of years of experience of the rice farmer, it takes the value 1 if the rice farmer has an experience < to 5 years and 2 if the number of years is > = 5 years	+	+
training	The training variable indicates whether the producer has received training in rice cultivation, and takes the value 1 if yes and 0 if not.	+	+
fort_capital_objective	Indicates the level of objective capital of the farmer, it takes the value of 1 if the level is strong and 0 if not	+	+
low_capital_goal	Indicates the level of objective capital of the farmer, it takes the value of 1 if the level is low and 0 if not	-	-
fort_cap_sub	Indicates the level of subjective capital of the farmer, it takes the value of 1 if the level is strong and 0 if not	+	+
low_cap_sub	Indicates the subjective capital level of the farmer, it takes the value of 1 if the level is low and 0 if not	-	-
pluvial system	Indicates the production system practiced by the respondent, it takes the value 1 if the respondent practices the rainfed system, 0 otherwise	-	-
smallholder	This variable indicates the size of the farm. It takes the value of 1 if the farm is smaller than one ha and 0 if not	-	-
large operator	This variable indicates the size of the farm. It takes the value of 1 if the farm is bigger than two ha and 0 if not	+	+
nutrient retention	This variable indicates the type of soil used by the producer, it takes the value 1 if the soil is able to retain nutrients and 0 otherwise	-	-
Drainage capacity	This variable describes the nature of the soil. It takes the value of 1 if the soil has a high drainage capacity and 0 if not	+	+
low mechanization	Indicates the level of mechanization, it takes the value 1 if the mechanization is low and 0 otherwise	-	-
OP membership	It indicates if the producer belongs to a producer organization and takes the value 1 if yes and 0 otherwise.	+	+
technical support	Indicates whether the respondent received technical support; 1 if yes and 0 otherwise	+	+

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Access to credit	This variable indicates whether the farmer has access to credit. It takes the value of 1 if yes and 0 if no	+	+
Market Opportunities Village_Market	Indicates the type of outlet, it takes the value 1 if it is on the village market and 0 otherwise	-	
Opportunities Formal Aggregator	Indicates the type of contract, it takes the value 1 if it is a formal contract and 0 otherwise	+	
SAR	This variable indicates the adoption of improved seed by the farmer, and takes the value 1 if the farmer uses improved seed and that seed comes from ICAT or ITRA and 0 otherwise.		
Perception	Indicates the collection of the CC; it takes the value 1 if the producer declares to have collected the CC and 0 otherwise.		

Source: Author, based on survey data.

III. RESULTS AND DISCUSSION

The table summarizes the results of the selection model (Heckman's Probit) used to determine the main factors influencing farmers' ability to perceive climate risk and the adoption of improved rice seed. This model is used by incorporating the four central moments to analyze the effect of endogenous risk related to the adoption of the new technology. This allows us to analyze the risks upstream and downstream of the decision to adopt improved seeds. The estimated model is globally significant at the 5% statistical threshold and the Wald test is significant, reflecting the acceptance of the hypothesis of simultaneity of decision and perception. Thus, the ability to perceive climatic risks strongly determines the decision to adopt an innovative technology to protect oneself from the potential perceived risk. As was the case in Benin (Yegbemey *et al.*, 2014), Burkina (Ouedraogo *et al.*, 2010) and Niger (Dédehouanou, 2016). If perception is considered the main determinant of the adoption of innovative technologies, it is important to understand what determines both the ability to perceive and other explanatory factors of the decision to adopt these technologies, keeping in mind that a new technology is in itself a carrier of risk.

Determinants of climate risk perception

Certain factors were diagnosed to analyze their influence on the capacity to perceive climate risks. In this case, it is particularly the risk of drought and the risk of flooding. Beyond the socio-economic and institutional characteristics often mentioned in the literature, the analysis here integrates the characteristics of the plots.

Socio-economic characteristics

Overall, socio-economic characteristics have little influence on climate risk perception ability. Only marital status, agricultural education and subjective capital level significantly influence the climate risk perception capacity of the farmers studied. Indeed, although it is expected that married farmers would have a greater ability to perceive climate risk due to their level of responsibility, the results here indicate the opposite. Single farmers perceive risks better than married farmers. This result can be explained by the fact that the latter's level of responsibility requires them to diversify. Thus, they do not concentrate on the sole agricultural activity at the risk of putting their socioeconomic vulnerability at risk.

Table 2: Results of the heckman selection probit model

variable	Adoption of SAR		Perception of climate risk	
	Coefficients	std. Err	Coefficient	std. Err
Socio-economic characteristics				
male	-0.208	0.192	-0.245	0.159
Age	-0.0139	0.009	0.007	0.007
Not educated	-0.548**	0.271	0.214	0.199
primary	0.069	0.185	0.196	0.153
bride			-0.331*	0.183
household size	0.006	0.023	-0.012	0.017
agriculture	0.388	0.344	-0.287	0.268
land heritage	0.143**	0.068		
Farming_experience	-0.002	0.011	-0.005	0.008

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training		1.483***	0.215	0.114	0.324	0.677***	0.171
fort_capital_objective							
low_capital_goal		0.670*		0.409		-0.111	-0.111
fort_cap_sub		-		-		-0.376*	-0.376
low_cap_sub		-0.612***		0.243		-0.146	-0.146
Characteristics of the plot							
pluvial system		0.790**		0.362		1.097***	0.440
small area		-0.551		0.386		0.074	0.259
large areas		-0.880**		0.445		-0.124	0.245
nutrient retention		-1.187		0.725		1.592***	0.661
Drainage capacity		-0.671*		0.749		1.654***	0.687
low mechanization		-0.142		0.197		0.189	0.161
Institutional factors							
OP membership		-0.218		0.233		0.147	0.201
technical support		1.133***	0.202	-0.044	0.185	1.030***	0.191
Access to credit							
Market Opportunities Village_Market			-0.088		0.191		
Opportunities Formal_aggregator			0.870***		0.177		
Analysis of the central moments							
1^{er} moment	Instruction		-0.0004		0.0002		
	fort_cap_sub		0.0005**		0.0003		
2^e moment	Instruction		3.32e-07**		1.76e-07		
	fort_cap_sub		2.48e-07*		1.48e-07		
3^e moment	Instruction		6.80e-12		4.35e-11		
	fort_cap_sub		-6.07e-12		2.88e-11		
4^e moment	Instruction		-1.18e-15		1.84e-15		
	fort_cap_sub		-3.59e-16		1.42e-15		
/athrho			17.710***		0.475		

LR test of indep. eqns. (rho = 0): chi2(1) = 4.96**

In the same sense, farmers with high subjective capital are less likely to perceive manifestations of climate risks. Subjective capital here expresses the level of skill and leadership. This variable is proxied by experience with agricultural projects and programs and proximity to an urban center. Thus, farmers in urban proximity perceive less risk of drought (only 28% versus 64% for those who are far away). Similarly, farmers who have benefited from an agricultural project perceive less climatic risk (about 20%) than those who have not benefited (38%). These projects and programs improve their socio-economic situation and reduce their level of climate vulnerability. On the other hand, farmers who have received training in agriculture have a greater capacity to perceive climate risks. Similarly, the technical support provided by the accompanying services improves their ability to perceive climate risks. This support not only allows for the mastery of technical itineraries, but also climatic information. This contributes to strengthening their ability to read the evolution of the climate.

Factors related to the parcels of land

Beyond the socio-economic characteristics of the farmers, let us say that the characteristics of the plots were integrated to analyze their influence on the perception capacity. Of all the characteristics involved, only the drainage capacity, the nutrient retention capacity of the plots and the fact that the plot is irrigated or not influence the farmers' ability to perceive climate risks. It should be noted that farmers operating on nonirrigated plots perceive climate risks very quickly than those operating on irrigated plots. Similarly, plots characterized by high drainage capacity and those with high nutrient retention capacity significantly and positively influence farmers' ability to perceive climate risks. It must be said that the owners of plots with high nutrient retention capacity clearly have control over their production system. Thus, they are very sensitive to losses related to climate risks. Thus, it is concluded that socioeconomic factors and plot characteristics significantly influence the ability to perceive climatic risks, which in turn influences the decision to adopt improved seeds. It is then necessary to look at the determinants of the latter.

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Determinants of improved seed adoption

The determinants of resilient technology adoption have been the subject of a wealth of research. Beyond socioeconomic and institutional factors, farm-level factors are involved in this analysis.

Socio-economic factors in the adoption of improved seeds

i. Human capital and adoption decisions

One might imagine that farmers with higher levels of education have a better understanding of the technology, and thus are more willing to judge its usefulness and adoption. Indeed, the table shows that farmers with no education are less likely to adopt the technology. In the same vein, many studies have also been able to show a positive correlation between adoption decisions and level of education in Sub-Saharan Africa (Kebede *et al.* 1990; Chirwa 2005). Other authors find that the level of education is not only a determining factor on adoption decisions, but also on the intensity of use of the new technology (Croppenstedt *et al.* 2003). Also, if the new technology requires higher cognitive ability and or experience, it will be expected to be less accepted by farmers with low human capital. Gollin *et al.* (2014) show that low human capital among farmers is known and it is even more accentuated in developing countries. The work of Kebede *et al.* (1990) in Ethiopia, shows the link between the level of education, work experience and adoption decisions of new technologies among farmers. All this reinforces our findings that farmers with strong objective capital readily engage in innovation initiatives. This is reinforced by participation in agricultural training sessions.

ii. Farm household assets

Many studies have been able to show the positive correlation between the level of wealth of the farm household and the choice to adopt a new technology (Kebede *et al.* 1990; Alene & Manyong 2006; O'Gorman 2006; Hailu *et al.* 2014; Lambrecht *et al.* 2014). Farming households in Sub-Saharan Africa, generally characterized by low purchasing power, may have less incentive to undertake a new technology due to investment needs and their greater vulnerability to associated risks. Also, for these poor farm households, acquiring the new technology may come at the cost of transiently foregoing other needs, making the adoption decision even more difficult, especially if there is no assurance that the technology will improve the initial situation. In contrast, wealthy farm households may be tempted to play the game by devoting a portion of their income to acquire the new technology despite the associated risk. Thus, our results confirm this assertion. Indeed, our results show that farmers characterized by a high level of wealth are more likely to adopt the technology in question. *o Institutional factors and the adoption decision*

Market and product valuation factors

Issues related to conservation (Ricker-Gilbert & Jones 2015) and market valuation (Alene & Manyong 2006, Hailu *et al.* 2014) are believed to influence the use of new technologies. Thus, the analysis of the results reveals that farmers who manage to secure the market through the signing of formal contracts with aggregators readily adopt improved seeds. Indeed, if the new technology creates surpluses that need to be transported several kilometers in order to be valued, the technology will be less effective. Thus, Sub-Saharan Africa, which is characterized by impractical transportation systems, especially in rural areas, is losing efficiency in the use of new technologies in agriculture. Furthermore, better organization of actors, especially via communication tools such as cell phones, would allow for improved market practices in order to better benefit from the adoption of new technologies (Baumüller 2012).

The Implementation and Monitoring Approach

If the adoption of new technologies in agriculture can be influenced by all of the above-mentioned factors, it is important to take into account the role that the agents in charge of the extension of the technological tool could play (Feder *et al.* 1985). The way in which these agents collaborate with farmers and their level of mastery of this tool will condition the decisions of its adoption by farmers. In this sense, the results show that farmers who have benefited from the support services tend to adopt the technology better. Thus, strengthening extension services would also allow for better support to farmers in the process of adopting and appropriating the technological tool (O'Gorman 2006; Ricker-Gilbert & Jones 2015).

Considering risk in the process of technology adoption in agriculture

Risk is one of the main factors for rejecting innovation (Feder 1980, Ghadim *et al.* 2005). Many works have highlighted the weight of risk aversion in the innovation adoption process and reveal that the level of risk aversion of farmers is generally higher than that of entrepreneurs in other agricultural sectors (Harrison *et al.* 2007; Hellerstein *et al.* 2013). This is because farm operators are used to experiencing risk and are overall more risk tolerant, but like all entrepreneurs, they are more sensitive to the risk of loss (Bocqueho *et al.* 2011). The central role of risk in the farmer's decision is highlighted in this research through the importance of the central moments in the sample. The first and second moments, which approximate expected yield and yield variance, are highly significant. The third moment, which approximates yield skewness, and the fourth moment are not statistically significant.

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These results indicate that the higher the expected yield, the greater the likelihood that a farmer will decide to adopt a new improved seed technology, as he expects to be able to afford the adoption of new technologies that improve resistance to attack and water stress. In addition, the greater the variance in yield (and the greater the likelihood of facing extreme yield values), the greater the likelihood of adopting new improved seed technologies. This allows farmers to reduce production (yield) risk through shortening the production cycle. This result provides evidence that farmers invest in new technologies as a way to hedge against input-related production risk. Finally, the statistical insignificance of the third yield moment indicates that farmers do not consider downward yield uncertainty when deciding to adopt a new improved seed technology. In other words, although the choice of improved seed technology is relevant to addressing production risk (as measured by yield variance), these results suggest that technology choice does not affect exposure to downward yield uncertainty.

The interaction of the four profit moments with education, and the level of subjective capital allows us to test whether the amount of information accumulated by the farmer (through education, and the level of subjective capital) affects the farmer's response to risk. It turns out that higher education and the higher level of subjective capital increase the farmers' response to the variation of the first and second yield moment. This result indicates that the more educated and skilled the farmer is, the more sensitive he is to the parameters that affect the expectation and variance of farm yield. As a result, his likelihood of adopting a new technology to protect himself against outlier activity in his yield distribution increases.

IV. CONCLUSION

In this paper, we develop a theoretical model to simultaneously describe the adoption of improved seed technology and the climate risk perception capacity of farmers facing production risks and incomplete information about the new technology. The adoption condition is derived from the assumptions of upstream climate risk perception and downstream farmer risk aversion, and assuming that uncertainty can arise from two sources: the randomness of climatic conditions and the uncertainty of future yield streams associated with the use of the new technology. We estimate a reduced form of this model through the Heckman selection probit using a sample of plots 545 distributed in the five regions of Togo. The estimation procedure is developed in two steps. In the first step, we estimate the first four moments of the benefit distribution and in the second step, we incorporate these estimated moments into the model of technology adoption and climate risk perception. We find that risk plays a central role in farmers' decisions, first through the direct effect of its perception and second through sampling moments of the yield distribution in the adoption model.

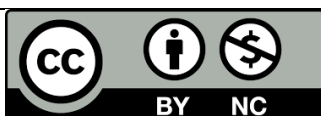
These results have important policy implications. First, the adoption of new and improved seed technologies to reduce production cycle length and enhance resistance to water stress can be used as a means of managing climate risk. Second, when a policymaker is considering the introduction of economic instruments (e.g., subsidies) to incentivize the adoption of innovative technologies, he or she should incorporate into the relevant cost-benefit analysis the expected benefits that farmers derive from the reduction in their production risk caused by adoption. Ignoring these benefits could lead to welfare-enhancing policies that do not meet a cost-benefit test. Finally, when the effect of a new technology on future returns is uncertain, the provision of adoption-related information induces faster diffusion among farmers, reducing the quasi-option value of adoption.

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An Analysis of Traditional Chinese Patterns in Arts and Crafts

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ABSTRACT: A brief analysis of the relationship between art and life through the presentation and development of traditional patterns on different utensils. In the four major sections of pottery, bronze ware, clothing and arts and crafts, relevant explanations are given on the application of traditional patterns. The diversity of traditional patterns starts from the level of cultural development, and plays a key role in the impact on people's life development and the inheritance, promotion and integration of traditional culture. Through the study and understanding of patterns, we can discover the inclusiveness of art and people, art and culture.

KEY WORDS: Chinese traditional patterns; decorative arts; arts and crafts

1. THE DEVELOPMENT PROCESS OF TRADITIONAL CHINESE PATTERNS

1.1 Display of traditional patterns on pottery

Throughout history, painted pottery of various regional cultures has different styles, shapes and colors. Pottery first appeared because of the needs of human beings for production and life. As time goes by, people's artistic aesthetic awareness gradually improved, then they began to draw patterns on these pottery. The pottery of the Yangshao Culture period has appeared with traditional Chinese patterns, which is an important cultural sign. The pottery is embellished with exquisite and meticulous patterns, especially the appearance of painted pottery has brought a variety of traditional patterns to display. China's Banpo type, Majiayao type, Miaodigou type, etc. have various distinctive Chinese patterns. The diversity of its decorative techniques makes each pattern have a different meaning. For example, the painted pottery patterns of Banpo type are mainly geometric patterns, including wide band patterns, diamond patterns and some linear patterns. These patterns are rich in rhythm, regular in arrangement, and have certain decorative elements with a sense of order. The style is simple and not pretentious, representing the exploration and recording of the real world. Fish-shaped pattern is one of the distinctive traditional patterns (As shown in Figure 1), The fish pattern was originally a figurative pattern, and then gradually became a simple geometric pattern, and the number of paintings on the pottery also changed from the earliest one to many. The same is true for human face patterns. The simple lines and stripes on the human face and the fish-shaped patterns are combined into one, forming a new pattern. The pattern is unique, and the pattern is given special meaning. It is full of associations with the artistic conception of heaven and earth.

1.2 The historical origin of patterns and bronzes

Bronze ware is one of China's splendid cultures, closely related to human social life, showing the rapid development of smelting technology in Chinese society at that time. Most of the decorative patterns of bronze wares in the Shang Dynasty were related to sacrifices, and most of the patterns were created by imagination. The bronze patterns cast and portrayed on bronze ware are also constantly changing with the development of culture. From the initial admiration for the gods, with the development of time, they are gradually related to real life. The decorative patterns of the early bronzes were mostly people and animals. Although the patterns were simple, they were somewhat rough. In the mid-term, with the gradual improvement of bronze smelting technology, bronze patterns were refined and beautiful, and multi-layer pattern decoration began. Symmetrical patterns and Fret patterns appeared, which formed a comparative relationship with the main patterns. There are two kinds of animal patterns in the Shang Dynasty, one is a real animal, and the other is a mythical beast with a specific meaning imagined by people. The Shang Dynasty was an era in which monarchical power was granted by gods and the political concept of destiny and divine power, so the

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second pattern was more common in its decoration (As shown in Figure 2).The main utensils used for sacrifice in the Shang Dynasty were made of bronze, and the meaning of these traditional patterns is also related to it. For example, the dragon pattern is one of the traditional patterns which has been used the most and the longest. Compared with nowadays, the dragon pattern at that time was a pattern that was added and merged to almost become a deified pattern, with auspicious and beautiful meanings.

1.3 Application of traditional patterns on clothing

Clothing is an indispensable necessities in people's life. China is the first country to use silk as clothing. With the progress of the times, people's requirements for silk fabrics have gradually increased, and the styles of demand are also diverse. There are many and complex patterns in Chinese clothing art, and the craftsmanship styles are also completely different. Brocade and Embroidery, as the splendid crafts, these two main methods are from the costume art of the Han Dynasty. The original clothing patterns were widely used in embroidery patterns of plants and animals, mostly dogwood patterns. With the development of the times, people wisely embroider the text representing the meaning on the clothing silk to form a unique text pattern. This type of text pattern has become more common in the western region of China, and clothing with text patterns has formed a special Chinese clothing cultural phenomenon and has become a carrier for the development and dissemination of traditional culture.

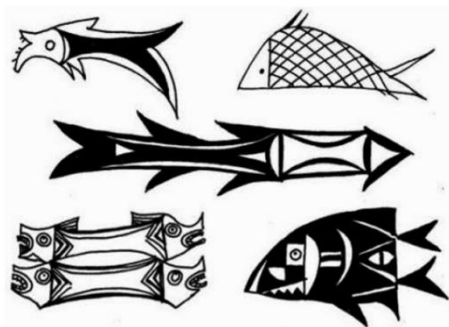


Figure 1. Fish-shaped pattern



Figure 2. Shang Dynasty bronze pattern

2. THE FUSION OF TRADITIONAL CHINESE PATTERNS AND DECORATIVE ARTS

The emergence of decorative art is indispensable, which is a manifestation of human aesthetic consciousness and the perception and understanding of life. For thousands of years, the works of Chinese arts and crafts have been widely known, and the traditional patterns on them are even more exquisitely decorated. These traditional patterns are preserved in the world with their own lines and tell the charm of ancient Chinese culture. This is a method of combining the beauty of art with the senses. It is a design that meets the needs of social development at that time. This design is integrated into life, giving them shapes and colors, and presenting human behavior in an artistic way. It is transformed into art culture with a special method, and a more interesting civilization culture is formed through the perception of beauty in art, so that human life is full of decorative colors, Improve human needs for quality of life and the impact of psychological value. The arrangement of patterns, coupled with various expression methods and techniques such as rhythm, composition, patchwork, symmetry, etc., are integrated into a new decorative art with aesthetic awareness.

Artistic creation is the liberation of human nature. The traditional Chinese decorative art of patterns was produced a long time ago. The formation of each thing is related to specific conditions and environments, and is full of the combination of necessity and chance. So how did the word "pattern" come about? There are many speculations about this issue. Some people think that the patterns on the artifacts were discovered accidentally by humans. Later, people innovated into decorative patterns, and refined

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and beautified them again and again and gradually became the mature traditional patterns. In primitive tribes, cavemen will use some ordinary natural small objects to decorate and embellish them, and some will also color them to make them beautiful. These patterns are endowed with a variety of decorative art meanings, representing the ancestors' yearning for a better life and their exploration and recording of the real world. Using different expressions to explain, from simple to complex, from image to specific, from single color to colorful decorative patterns, etc., the human artistic thought form has changed from being bound to creating in a unique visual form. Decorative art has always adjusted the boring and uninteresting life of human beings in the past with its special modeling techniques, making life full of artistic flavor and beautiful enjoyment, making people relax and taste in an artistic form. It connects the patterns, decoration and culture in traditional art.

3. THE DIVERSITY OF CHINESE TRADITIONAL PATTERNS

3.1 Patterns of single style

The pattern of a single pattern refers to the main pattern on the utensil as an independent form of expression, specifically using a pattern to express the interpretation of the beautiful meaning on the utensil. The use of this pattern will be more stringent in terms of point, line, and surface requirements, and in the process of drawing, it needs to be adapted to the shape, color, size and other factors of the object to be drawn. In use, it should cooperate with the utensils and complement each other to avoid a series of problems caused by the inconsistent effect of pattern decoration. The more common composition methods of a single pattern are mainly asymmetric and symmetrical. Symmetrical composition brings people a comfortable feeling (As shown in Figure 3), while asymmetrical composition is more flexible (As shown in Figure 4). The use of cloud patterns is mostly asymmetrical patterns, most of which are delicate and diverse, and the styles are also much richer and more different.



Figure 3. symmetrical plant pattern



Figure 4. asymmetrical cloud pattern

3.2 Continuity of patterns

Continuous patterns in the utensils and clothing, mostly one pattern is drawn continuously for many times, with a sense of order. The continuous pattern will be more substantial and rich in composition, which is mainly suitable for a wide range of main decorations. As shown in Figure 5, the fret pattern is a typical continuous pattern, which is formed by seamlessly connecting a group of patterns similar to the Fret in multiple groups, with regularity and uniformity. The application of Fret pattern has a long history, from the early painted pottery to bronze, and is still being used until now. There are many such common patterns, such as

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water patterns, weaving patterns, etc. Such a composition effect is neat, the decorative effect is more obvious, and it brings a different feeling from a single pattern pattern.

3.3 Plane line of sight pattern

The composition form of the plane line of sight pattern is full and complete, occupying a major position on the whole, and can fully show the content and ideas that you want to express in the picture. It is widely used in the depiction of scenes. It is divided into one or several parts in an orderly manner from a head-up perspective. Each part expresses different meanings of patterns, although the content in different parts is different. But they will form a new unity and feeling with each other, which is interesting. Its composition method is different from that in the early days, and it can better show the life at that time. As shown in Figure 6, the decorative scene depicted on the Yanle copper pot is a pattern using a plane perspective. Each part expresses different content, and the composition effect is complete and unconstrained, and each has its own characteristics.



Figure 5. Continuous Fret pattern

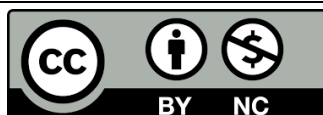


Figure 6. "yanle" Copper kettle

Chinese traditional patterns are one of the representatives of traditional culture. The purpose of analyzing the significance of Chinese traditional patterns in arts and crafts is to spread the ancient Chinese culture, understand the creation methods and wisdom of ancestors, and get some inspiration from it. In modern society, the development of patterns requires us to adopt innovative methods to inherit, extract the refined elements for creation, obtain a new way of expression, and use them flexibly.

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Knowledge and Practices of Medical Officers on Medical Near Misses in a Tertiary Care Hospital, Sri Lanka



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ABSTRACT

Background: Near misses are the most crucial and valuable elements in the prevention of potentially unintentional harm in patients service provision. Reporting incidents is an essential component in inculcating patient safety culture. In developed countries medical services are now focused on vigilance on such near misses. This paradigm shift of medical service provision paved the way for patient safety domain in medical service design. Patient safety has now become one of the six constituents of service quality. Continuous vigilance for possible near misses will disclose them beforehand. This will avoid triggering the chain reaction that bring about disastrous patient outcomes. Favorability of existing practices and knowledge on near misses are two key determinants of the successful safety culture initiatives.

Methods: Cross sectional descriptive study carried out at the Colombo South Teaching Hospital. A stratified sample of medical officers was selected out of those involved in the patient care services. Stratification was done according to the service categories such as specialist grade, grade medical officers and intern officers. Most reason salary sheet used as the sampling frame to select medical officers randomly from each stream. A pretested self-administered questionnaire was used, as the study instrument. The questionnaire contained two main sections as knowledge and practices. Data analysis done using PSSP software.

Results: Over all response rate was 90%. Over 94% of respondents had satisfactory or good level of knowledge. 88% did not report near misses. Overall, a considerable percentage (n=168, 53%) had poor level of practices. Only 5.9% (n=19) had good level of practices. In the specialist grade medical officers 41.1% had poor practices despite none of the specialists having a poor knowledge. Highest level of poor practices (n=128, 70.8%) was seen in grade II medical officers.

Conclusions: The study reveals that majority of medical officers at CSH have a satisfactory knowledge on the near misses as predecessors of the of patient harm. continuous engagement in near misses' surveillance in an organization is an integral component in a patient safety culture.

However, the practices are not satisfactory in a majority.

KEY WORDS: Near misses, surveillance, incident reporting, safety culture, medical officers, hospital

I. INTRODUCTION

Near misses or close calls are forerunners of iatrogenic patient injuries. Near misses compromise safety during various therapeutic procedures. These injuries are unintended outcomes of treatment. Most of these unintended medical errors do not result in patient injury.¹ However injuries are "tip of the iceberg". There are accidents "dormant" within the system for many years before they combine with active failure and local triggers to create an accident opportunity.² This, yet to happen group, usually goes unnoticed unless they cause overt injury. This category encompasses, so called near misses.

Near misses are the predecessors of patient harm. It is also called a close call. An incident which did not reach the patient.^{3,4} A patient safety incidents (PSI) is defined as any unintended or unexpected incident which could have or did lead to harm for one or more patients receiving care.⁵ According to British Institute of Radiology a near miss is "a potential radiation incident that was detected and prevented before treatment delivery. However, mistakes in plans, calculations etc, do not constitute near misses if they were detected and corrected as part of the checking procedure before authorizing for clinical use". It also says that, the term 'miss' is used in the context of falling short of being an actual radiation incident, rather than in the narrower sense of a

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geometric miss.⁶ World Health Organization defines “near miss” or “close calls” as serious error or a mishap that has the potential to cause an adverse event.⁷

Patient safety initiatives that are presently in operation at global scale have made the medical profession aware on the safer medical practices all over the world. Medical errors, their incidence and gravity of the issue came into attention with reports of institute of medicine in 1999 with the publication of “To Error is human; building a safer health system”.⁸ In the ice breaking finding, the authors described an estimated 44,000 to 98,000 deaths in America annually. Following this, many articles and studies described similar study finding. The three reports that change the global health care vision from primary health packages to quality and safety dimensions are as follows⁹; The institute of medicine’s (IOM) National Round Table on Health Care Quality Report, “The Urgent Need to Improve Health Care Quality”,

In United States, Wenzel has estimated that CLABSI (Central Line Associated Bloodstream Infections) affect an estimated 48,000 ICU patients every year and of them 50% die.¹⁰ In the United Kingdom, over 1000 people died from adverse drug events in 2001. It has been suggested that 75% of these errors are preventable.¹¹ It is estimated that economic losses up to 2.5 billion of Euros occurred due to compensations for medical mistakes in Italy. Development of a common international framework for classification, adverse events reporting near misses is one of technical components WHO’s global strategy.

In the early administrative guideline of the ministry of health, prime focus was on basic health care curative package. This is seen in health manual of 1994. In the latter part of 1990’s Japanese “five S” concepts appeared in non-health business sectors of Sri Lankan market. In the government health services, Castle Street Hospital for woman winning a quality award became an eye opening event.

With the establishment of Quality Secretariat under the Ministry of Health, there is an ongoing discussion on this topic. A circular letter No 01-29/2009 has been issued by the Ministry of Health as an initial step. By this circular for the first-time instructions were issued to collect data on patient safety issues. The circular letter also advises to collect data on near-misses, adverse events and patient accidents. However, in Sri Lanka exact figures on near-misses are not known.

Some near misses’ cases in which no harm at all, illustrates important system problems and have tremendous learning value for the organization.¹² There are two types of victims of medical near misses and errors. The largest impact is on patients and their loved ones; the toll is best measured in anxiety, harm, and death. Service providers are “second victims” of unsafe systems that let them down when they most needed the support. Exact evaluation on the survivors of medical near misses is not done in Sri Lanka. In one study done in Australia shows that most of patients experiencing adverse events are elderly people.¹³ It is also pointed out that death toll, permanent and temporary disability are highest in aging population.

The medical error affects the care giver too. There court cases that affected the care givers. Unnecessary fears of reprimand can make Health Care Workers (HCWs) adhering to rigid protocols and legislations. Hospitals with an error management culture aims to learn from errors rather than repeat them. In this culture, employees are encouraged to report and discuss errors and near misses. Rather than avoiding the problem, this allows people to confront it. Near misses will lead to sensitizing the HCWs and thereby leading to prevention or to mitigate effects of medical errors and mistakes.

Most of the risk of factors are innocent human errors.¹⁴ Lack of leadership commitment is one major risk factor.¹⁵ In developing a sustainable error prevented hospitals systems committed leader is a strong positive factor. Medical profession all over the world is maintaining high hierarchical gaps.¹⁶ They are less reluctant to discuss mistakes and this is an identified risk factor for closely communicating organizational safety culture. Culture of blames and communication gaps are important risk factors that harbor influence negative patient outcomes.¹⁷ Communication gaps accounted for around 15% of the potential adverse events. Communication within care teams, between the teams and, or their relation have given rise to potential and real-life medical errors.

II. METHODS

This research adopted the descriptive, cross-sectional method to assess knowledge and practices on near misses among medical officers. The study was carried out in Colombo South Teaching Hospital, Kalubowila (CSTH). The CSTH is a tertiary care hospital where all categories of medical officers from specialist grade to intern medical officers provide patient care services. The hospital is under line ministry administration. It has a university professorial unit also. academically high profile. very senior experienced medical officers in all grade categories.

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The study population consisted of medical officers attached to the Colombo South Teaching Hospital. Medical Officers who are presently attached to the medical officers directly involved in the treatment of patients care activities were included. The calculated sample size was 352 medical officers. As there were 565 medical officers who fulfilled the eligibility criteria. The study sample was selected propitiate to the total number in each category of medical officers.

Table 1: Distribution of medical officers by category

Category of medical officers	Number of officers of available	Number of officers of selected
Specialist Grade	75	47
Grade-I	100	63
Grade-II	322	200
Preliminary grade	19	11
Intern Medical Officers	49	31
Total	565	352

The name list of medical officers belonging to each category was prepared based on the most current pay sheet. The medical officers selected randomly for each category using the name list for each category as the sampling frame this ensured that a representative sample was obtained covering all eligible units. the selected medical officers were contacted and questionnaires was administrated during working hours. If the selected medical officers were randomly selected using the same sampling frame. This was done until the required number of medical officers were recruited.

A self-administered questionnaire used as the study instrument. Self-administered this selected since medical officers being intellectuals and data collection can be completed with in the specified short period of time. The questionnaires contained three parts; Part -1 Sociodemographic data of the study population, Part-2 knowledge on the near misses, Part-3 Practices on the near misses. Pre testing carried out in a teaching hospital with a similar background. Data was collected on week days since certain medical officers are off duty on weekends and public holidays.

Data was analyzed using Statistical Package for Social Sciences. A scoring system was designed to allocate a score for each response of the close ended knowledge questions. There were 10 questions to assess the knowledge component of the participants. Correct answers given 2 marks and incorrect 0. Total score rages from 0 -20 and the percentage was calculated for each participant. Based on the percentage scoring, it was further categorizing into four levels as shown below.

There were 10 questions regarding self assed work practice. Correct response given 2 marks and incorrect response given o marks. Total score ranged from 0-20. Percentage calculated for each participant.

III. RESULTS

The sample size for the study was 362. Even though all eligible medical officers consented for participation 317 returned the completed questionnaire giving an overall response rate of 90%.

Following categorization was used to categorize the knowledge scores.

00 -49%	-	Poor knowledge
50- 74 %	-	Satisfactory knowledge
75 -100%	-	Good knowledge

The average marks respondents got are summarized in table 2. The mean knowledge score was 74 out of 100 and was expressed as 74%. Range for the sample was from 30 – 100 marks.

Table 2: Distribution by knowledge category

Category	Frequency	Percentage (%)
Good	168	52.9
Satisfactory	130	41.2
Poor Knowledge	19	5.9
Total	317	100.0

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A majority (88%) did not routinely report near misses. 72% indicated that protocols are adhered the respective units. Of the respondents 54% indicated that in an undesired effect affecting a patient the responsibility is fixed to the staff involved. Only 28% routinely asked the nursing officers regarding re admissions to the unit. 43.8% indicated that they work under the pressure of somehow finishing the work load at your clinical practice (Table 3).

Table 3: Frequency distribution by practices in relation to near misses

	Practice	Response	
		Yes (%)	No (%)
1.	Routine reporting the near misses or unintended patient injuries in a register(<i>correct practice</i>)	12.0	88.0
2.	Own or a national (standard) protocols that are adhered in the unit(<i>correct practice</i>)	72.0	28.0
3.	Adhere to short cut of recommended protocols in your clinical practice at CSTH(<i>Incorrect practice</i>)	56.2	43.8
4.	In an undesired effect affecting a patient, fix the responsibility on staff involved(<i>Incorrect practice</i>)	54.0	46.0
5.	Encountered diagnostic errors or medical errors during last 3 month of practice(<i>correct practice</i>)	36.0	64.0
6.	Adhere to hand washing practices before patient's examination(<i>correct practice</i>)	40.1	59.9
7.	Have adequate facilities for hand washing as expected in ward/clinic(<i>correct practice</i>)	52.1	47.9
8.	Have an open culture in the unit(<i>correct practice</i>)	41.9	58.1
9.	Work under the pressure of somehow finishing the work load at your clinical practice(<i>Incorrect practice</i>)	43.8	56.2
10.	Routinely ask the nursing officers regarding re admissions to the unit(<i>correct practice</i>)	28.1	71.9

Correct response on practices (Yes or No) was given 2 marks and the incorrect response (Yes or No) was given 0 marks. Total score ranged from 0-20, and the percentage was calculated for each participant. Based on percentage scoring, it was further categorized into three levels as shown below.

Following scoring scale was used to categorize practices among the respondents.

0 - 49% - Poor practice

50- 74 % - Satisfactory practice

75 -100% - Good practice

Table 4: Distribution by level of practice

Level of practice	Frequency	Percentage
Poor	168	53.0
Satisfactory	130	41.0
Good	19	6.0
Total	317	100.0

Mean =48.4, Range= 0 -80

A considerable percentage (n=168, 53%) had poor level of practices. Only 5.9% (n=19) had good level of practices. (Table 4)

IV. DISCUSSION

Medical officers are the key decision makers on patient care in the hospital. Other staff categories make decisions within the framework of area prescribed by medical officers such as nursing management framework of a patient. Frequency of legal actions, media reports and conflicts with patients on patient management are increasing. The root cause of these are perceived

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errors and failures in patients' management. They are heard both in private and public sectors. In the present context globally the concept of "near misses" are now considered as an important component of quality of care. Therefore, in the Sri Lankan healthcare system should also take serious note on "near misses" in the path to improving quality of patient care.

The study was conducted as a descriptive cross-sectional study. The Colombo South Teaching Hospital was selected as the study setting since all categories of medical officers from specialists to intern medical officers work in a teaching hospital and representative sample could be taken. The name list of medical officers belonging to each category was prepared based on the most current pay sheet. The medical officers were selected randomly for each category using the name lists for each category as the sampling frame. This ensured that a representative sample was obtained covering all eligible units. Considering the feasibility and level of education of the respondents self-administered questionnaire was used as the study instrument. The questionnaire was prepared after extensive literature search and guidance from experts. The study instrument was pre tested before administering it to the study population.

The Colombo South Teaching Hospital is a line ministry teaching hospital with academically rich professional environment. Being a station in western province and capital of Colombo, most of the participants and hospital staff are senior and experienced medical officers. Sample was selected using stratified sampling procedure. In the process of stratification of sample of medical officers, the latest salary pay roll details was used. Therefore, it was a good representative sample and internal validity was preserved. Selection bias was minimized by having an appropriate eligibility criterion for the study population and using probability sampling technique with a design effect to select the sample. Random allocation of medical officers in each stratum made it further unbiased.

A good response rate of 90.0% was achieved. This was done over a very short time period. The most difficult act was to find time out of clinical specialists, who are having tight time schedules both in public and private. They had the lowest response rate (82.9%) A self-administered questionnaire was used to collect data, considering the standard levels of education of medical officers. Thus, opportunity for interviewer bias was eliminated. Further in this type of subject matter where punitive administrative mindsets make people be defensive and come out with socially acceptable answers, not having an interviewer is conducive for unbiased. It is one of the instruments that could be applied conveniently in this study setting and time frames. This being a novel and controversial subject matter in designing the questionnaire simple language was adhered to. Based on supported literature (Mock et al, 1999 and Landen & Hendrick, 1995) three months recall period was taken. The ability to recall increases with the severity of the incidents. In addition, maximum effort was taken to minimize recall bias.

The questionnaire contained questions which explored the basic knowledge on near misses that should be known by a medical officer. No respondent scored less than 30%. More than half (52.9%) had a knowledge score of 75% or above. The mean knowledge score was 74 out of 100. Only 5.9% had poor knowledge. These findings indicate that medical officers had good knowledge on near misses.

In contrast to the level of knowledge, overall a considerable percentage (n=168, 53%) had poor level of practices. Only 5.9% (n=19) had good level of practices. This finding may be due to the less importance given for prevention of near misses and near miss surveillance is not being carried out.

V. CONCLUSIONS

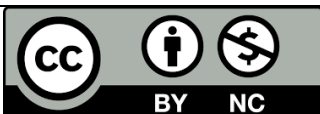
The knowledge on medical near misses was overall satisfactory in all categories of medical officers. In comparison to the satisfactory level of knowledge considerable proportion of medical officers in all categories had poor level of practices. This indicates the less attention paid on medical near misses. It is recommended that policy makers and medical administrators pay more emphasis on this important preventable area. A near miss surveillance system should be implemented together with regular review meetings.

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Character Formation through Internalization of Religious Values in Elementary School Students



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ABSTRACT: This research was conducted in elementary school Lab. School FIP-UMJ, South Tangerang. Indonesia. The research method used is a qualitative descriptive approach. The number of respondent studies was 25 students who actively participated in extracurricular activities through the internalization of the habit of reading the Koran. The results showed that the student's character was very good after they mastered the reading of the Koran well, had good attitudes and character. The attitude of the students that is formed is that they are aware to carry out worship because it is God's command. Spontaneous activities are in the form of giving warnings to students who make mistakes by advising and asking children to apologize. Therefore, as an effort to find a standard and ideal strategy in internalizing religious values in character building so that all attitudes a behavior of students are in accordance with the values of religious character, and thirdly, environmental based, student activities where students have a grand Taksmi program, activities that involving parents and guardians. The family is the first and foremost place for children's growth and development. The basis of character education should be applied from childhood or what psychologists call the golden age, because this age has been proven to greatly determine a child's ability to develop his potential. About 50% of the variability of adult intelligence occurs when the child is 4 year. The next 30% increase occurs at the age of 8 years, and the remaining 20% in the middle or late second decade. From here, character education should start from within the family which is the first environment for the growth of children's character.

KEYWORDS: character formation, internalization of religious values, elementary school.

INTRODUCTION

Education is a means to create intelligent human beings as well as to form human beings with character. Education does not only form intelligent human beings in terms of intellectual. However, the formation of character is also a very important part. Because, if education is only concerned with the creation of highly intellectual human beings without prioritizing good character, it will certainly lead to a bad nation. According to Mastuhu (2007), in Jamal Ma'mur Asmani (2011: 49), globalization provides extraordinary opportunities and facilities for anyone who is willing and able to take advantage of it, both for their own benefit and for the benefit of the whole human being. The keyword of globalization is competition. The competition, which comes out as the winner is the best in terms of knowledge, technology, network, product quality, service, integrity, and accountability, Indonesia, in the context of knowledge and technology, is still far below developed countries. Indonesia is still a nation of consumers who like to enjoy globalization's products.

Globalization has penetrated all corners of the world, even to remote areas, entering homes, bombarding moral and religious defenses, no matter how strong they are defended. Television, internet, newspaper, cellphones, and others are information and communication med that run quickly, rolling up traditional barriers that have been held firmly. In Indonesia, there are still many students who are involved in immoral behavior, fighting, drugs, sexual harassment, murder, and drinking. Cases of minors who are pregnant out of wedlock also add to the evidence of the number of failed products from existing education. According to Muslich (2007:67), that the decline of this nation is nothing but because in essence we are experiencing a character crisis.

This character development has been forgotten by the school so far. Schools are too focused on targeting national exams and other academic competencies. Intellectual intelligence is cultivated, while emotional and spiritual intelligence is marginalized. As a result, intellectual intelligence is destroyed because of the fragility of emotional and spiritual intelligence. Therefore, the government in an effort to improve the character of the nation's children is intensively implementing character

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education in the school environment. As stated by Muhaimin (2013:15), that currently, education in Indonesia is considered by many to be not problematic with the role of education in educating its students, but is considered less successful in building the personality of its students to have noble character. Therefore, character is seen as an urgent need.

Character education is one of the government's efforts in realizing national education goals. In accordance with the contents of Article 3 of Law Number 20 of 2003 concerning the National Education System which states that national education functions to develop capabilities and shape the character and civilization of a dignified nation in the context of educating life, aiming to develop the potential of students to become human beings who believe and put their trust, to God Almighty, noble, healthy, knowledgeable, capable, creative, independent and become a democratic and responsible citizen. However, in some elementary schools there is still no serious effort and consistency of teachers in instilling religious values in the formation of student character so that all student attitudes and behavior are in accordance with religious character, so in this study the researchers found that.

SD Lab. School FIP-UMJ is one of the elementary school that implements the internalization of religious values in the formation of the character of its students. SD Lab School FIP-UMJ is one of pilot Project School for the Ministry of Education and Culture's character education strengthening program. The internalization of religious values in the formation of student's character is clearly written in the vision and mission of SD Lab. School FIP-UMJ. The vision of SD Lab. School FIP-UMJ is the realization of a leading and modern school with environmental insight in creating a generation of noble character in 2020. Its missions are (1) to form a complete Indonesian human being, namely a man who is faithful and devoted, (2) to create a disciplined person, innovative, creative, have high solidarity and are future oriented, (3) develop student's abilities to have religious, national and state awareness, (4) develop children's potential according to their interest and talents, (5) build children's intelligence through multiple intelligences, (6) developing a culture of discipline and a high work ethic, (7) raising the spirit of achievement of all school members, (8) raising children awareness of caring for the environment, living clean and healthy, and (9) involving students in environmental action activities. Religious character is the foundation in the formation of children character, if the religious character is good then the other characters are also good.

Seeing the importance of character education, especially religious values in forming the character of students, it must be carried out and applied to students as early as possible so that it becomes a solid foundation for students so that in the future they are not easily carried away by the negative impacts of globalization and the negative impacts of lifestyle trends. Therefore, as an effort to find a standard and ideal strategy in internalizing religious values in character building so that all attitudes and behavior of students are in accordance with religious character values, in this study the researchers found that SD Lab. School FIP-UMJ is an elementary school that implements the internalization of values, religious values in the formation of the character of the students.

Based on the results of observations made by researchers in class 4.1 of SD Lab. School FIP-UMJ, South Tangerang, Indonesia, the efforts made by teachers in internalizing religious values in the formation of the character of student are through prayer activities before and after learning activities as well as saying the meaning of the prayer, *Qiroahti* every morning before learning activities, performing the *Dhuha* prayer in congregation, *Zuhur* prayer in congregation every day, *Infaq* every time Friday, always getting used to lining up and reading prayers in and out of the bathroom, and there are extracurricular activities in which there is a process of character building, shaking hands with greetings before entering class and class entry day starting with the right foot.

Formulation of the Problem

1. How to apply the internalization of religious values to elementary school students from Lab School FIP-UMJ, South Tangerang, Indonesia?
2. How to integrate religious values in the character formation of elementary school students from Lab School FIP-UMJ, South Tangerang, Indonesia?
3. What is the role of extracurricular activities in schools in shaping the character of elementary school students at Lab School FIP-UMJ, South Tangerang, Indonesia?

Research Purposes

1. To find out how to implement the internalization of religious values in character education in the elementary school Lab School FIP-UMJ, South Tangerang, Indonesia.
2. To find out how to integrate religious values in character building of elementary school student in the Lab School FIP-UMJ, South Tangerang, Indonesia.
3. To find out and analyze the role of extracurricular and character building of Lab School FIP-UMJ, South Tangerang, Indonesia.

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THEORETICAL REVIEW

Internalization and values, according to the Big Indonesian Dictionary (KBBI) (2005:439) internalization according to nouns is defined as appreciation: the state's philosophical processes take place in depth through counseling, upgrading, and so on, doctrine or value so that it is a belief and awareness and the truth of a doctrine or value that is embodied in attitudes and behavior. According to Mustari (2014:5), he argues that internalizing means "to internalize" or "to house oneself" or "to internalize" or to place in "ownership" or "to make full members". This internalization process takes place at the same as the adoption and dissemination of values obtained from religious instructions.

Based on the description above, it can be concluded that internalization is a process of entering values or incorporating ideal attitudes that were previously considered to be outside, so that they are incorporated into one's thinking in one's thoughts, skills, and attitudes to life. Internalization is an effort to share knowledge (knowledge sharing). Internalization thus, can also be translated as one of the methods, procedures, and techniques in the knowledge management cycle used by educators to provide opportunities for members of a group, organization, agency, company, or student to share their knowledge with other members, or someone else.

Internalization Process

The process of internalization is a process that takes place throughout an individual's life, from the moment the individual is born until the end of his life. Throughout his life an individual continues to learn to cultivate all the feelings, desires, passions, and emotions that make up his personality. The first feelings that are activated in the personality when a baby is born are satisfaction and dissatisfaction, which causes him to cry. Humans have a talent that has been contained in the genes to develop various kinds of feelings, desires, passions, and emotion in their individual personality. But its form and activation is strongly influenced by various kinds of stimulation in the natural surroundings, social and cultural environment.

The internalization process is basically only obtained from the family, but also from the environment. The environment in question is the social environment. Unconsciously we have been influenced by various community leaders, such as *Kyai*, *Ustad*, teachers, and others. We can learn some things that we get from them which then make it a personality and culture. Internalization is a process of inculcating cultural values. The cultivation and growth of these values is carried out through various didactic-methods of education and teaching, such as education, guidance between indoctrination brainwashing, and so on.

According to Mustari (2014:1), religious is the value of character in relation to God. This shows that a person's thoughts, words, and actions are always based on divine values or religious teachings. Religious character values are all values related to religious teachings. Indonesia is a religious nation. This is stated in the view of life of the Indonesian people, namely Pancasila. The first precept of Pancasila is belief in One Supreme God. It is clear that the value of divinity is the first value and becomes the foundation in the life of the nation and state. The most important religious character inculcation is carried out in the new family environment, then continues in the school and community environment. According to Asmani (2011:50), states that education must begin to be built at home (home) and developed in school educational institutions (schools), even implemented in real life (community), and even includes the business world and industrial world (business).

Meanwhile, according to Hariyanto (2013:110), states that education expert in Indonesia generally agree that character education should start from the age of children (golden age), because this age is proven to greatly determine a child's ability to develop his potential. Golden age is in the age range of 4-6 years. Although the internalization of religious character is very important to be implanted in the age range of 4-6 years, the continuation of the process of internalizing religious values in character building is very necessary to be carried out at the age of 7-12 years, namely the age of elementary school children. Seeing the importance of internalizing religious values in character building in students as early as possible, a standard strategy is needed in order to internalize religious values in the formation of student character.

Understanding Religious Values

In the Big Indonesian Dictionary (2002:783), value means price, intelligence, a lot of content or something that perfects humans according to their essence. Through values, humans can perceive their past experiences, live their present lives and answer future challenges for the task of perfecting themselves as beings who live together with other people in the world. As an appreciation of values, humans are able to weigh and assess their past journeys. What is in the past becomes a long chain for the creation of meaning for his life from the historical chain for generations to come.

According to Kurniawan (2013:38), states that the values developed in character education in Indonesia are identified as coming from one source (in this case religion, Pancasila, culture, and the goals of National Education) the first, namely religion. Indonesia society is a religious society. In every aspect of individual life, society and nation are always based on religious teachings and beliefs. It should be underlined that the values of character education must be based on values derived from religion. Because if the religious values are good, then the other values will also be good.

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Religious character must be instilled in students from an early age. The process of forming religious character, students will not take place by themselves, but the process is influenced by the school environment. All events that occur in schools should be integrated into character education programs, character education is a joint effort of all school members to create a new culture in schools, namely the culture of character education. The application of religious character education is now absolutely necessary not only at school, but at home and in the social environment. Even today, not only early childhood to adolescence, but also in adulthood, religious character education is absolutely necessary for the survival of this nation. Because Islamic religious character is an inherent characteristic of a person or object that shows Islamic identity, characteristics, obedience or impression.

Internalization of religious values is a process or method of instilling normative values that determine the desired behavior for a system that educated in accordance with the demands towards the formation of a national personality with character, which is based on religious values in accordance with the religion it adheres to. Religious character is related to religious teachings related to divinity or spirituality. So someone who has internalized religious values in himself, then all thoughts, words, and actions are based on the teachings he adheres to.

Definition of Character Education

Understanding education, etymologically, the word education comes from the basic word students, which get prefixes and suffixes. Turns into a verb to educate, which means helping children to master various knowledge, skills, attitudes, and values inherited from their family and society. This term first appeared in Greek, namely pedagogic which means association with children. The person who guides or educates children is a pedagogue. The word educare in Latin has the connotation of training or taming (as in the context of humans fruitful because the land is tilled and cultivated). So, education is process that helps grow, develop, mature, make the unorganized or wild become more organized, a kind of process of creating a culture and order in oneself and in others. A part from being a kind of domestication process, education also means the process of developing various kinds of potentials that exist in humans, such as academic, relational, talents, talents, physical abilities, or artistic abilities.

According to Albertus (2010:45), the word educare is a combination of the preposition ex (which means to get out of), and the verb educare (to lead). Therefore, educare can mean an activity to draw out or bring out. Education can mean a mentoring process in which there are two vertical relationship, between those who lead (dux) and those who are led. The relationship between the two is directed at one particular goal. Looking at the preposition ex used, this outward guidance process can mean internally or externally. Internally is the ability of humans to get out of their natural physical limitations. Humans, through the educational process, are able to work together with others outside of themselves to achieve the common goal of a society that helps each individual grow in the process of self improvement. He is able to cooperate and devote himself to a life whose interests reach the interests of many.

The word educare at first refers more to organic aspects, such as taming, guarding, mentoring, nurturing, nutrition, health, while the word educare refers more to more interior aspects, such as imagination, observation, intelligence, reason, way of thinking, attitude, critical, emotional, expressive, and operational. Historically, the word education has been widely used to refer to various meanings, such as development, growth/development, formation, socialization, in culture, teaching, training, renewal. The word education also involves interaction with various kinds of special institutional environments, such as family, schools, places of worship, groups, associations, foundations, movements. But at the same time it demands social responsibility within the framework of its relation complexity.

According to Made Pidarta (2004:30), there are several words that refer to educational activities. The word education, for example, is closer to the element of teaching (instruction) which has a very scholastic nature. Meanwhile, for the words growth and care, the term used is Bring-in up (this is closer to the meaning of maintenance and care in a family context). While the word training refers more to training, that is, a process that makes a person have the abilities to act (skills). Elements of teaching, care, and training, are part of an educational process itself.

In terms, education can be interpreted as a conscious and planned effort to create a learning atmosphere and learning process so that students actively develop their potential to have religious spiritual strength, self control, personality, intelligence, noble character, and skills needed by themselves, society, and society, nation and state. The definition of education, education has at least two functions. First progressive function. In this function, educational activities can provide knowledge and development, inculcate values and skills in anticipating the future so that the next generation of the nation has the ability and readiness to face challenges in the present and the future. The second function of conservative education is how to pass down and maintain the ideals and culture of a society to the next generation. If the two functions of education are related to the existence and nature of human life, in essence education is directed at the formation of the human personality.

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Developing humans as individual beings social beings moral beings and religious beings (religious). So, it can be said that the main purpose of holding education is not to create intellectually intelligent students, but also to build the personality of students. According to Budiyanto (2010:7), education is to prepare and grow students or human individuals whose process takes place continuously from birth to death. The aspects that are prepared and grown include aspect of the body, mind, and spirit as a whole without neglecting one aspect and exaggerating other aspects. The preparation and growth is directed to become a human being who is efficient for himself and for society and can obtain a perfect life. Education applies to everyone and can be done by everyone, even the environment, and is carried out by special institutions or institutions in order to bring them to maturity.

Comprehensively that education is all activities or conscious efforts made by educators to student on all aspects of personality development, both physically and spiritually. Formally, informally, and none formally that run continuously to achieve happiness and high values (both human and divine values).

Definition of Character

Character etymologically comes from the Latin character, which among other things means character, traits, psychology, character, personality, and morals. Character is a person's nature that can be formed and changed even though it contains innate elements that each person is different. Character is a trait in humans that exists without being desired and attempted. Budi character is the values of human behavior that are measured according to their goodness and badness through religious norms, legal norms, etiquette and manners, cultural norms and community customs. Morals are rules that teach how one should relate to God as well as how one should relate to humans. In terminology, character is defined as human nature in general which depends on the factors of his own life. Character is a psychological, moral, or character trait that characterizes a person's group of people. Character are values related to God Almighty, oneself, fellow human beings, environment and nationality which are manifested in thoughts, attitudes, feelings, words, and actions based on religious norms, laws, karma, culture, and customs, then character is the character or character of a person which is a special personality, and which distinguishes him from others.

According to Albertus (2010:80), character is associated with temperament which gives him a definition that emphasizes psychosocial elements associated with education and environmental contexts. Character is also understood from a behavioral point of view which emphasizes the psycho elements possessed by individuals from birth. Character is considered the same as personality. Personality is considered as a characteristic or characteristic or style or characteristic of a person, which comes from formations received from the environment, for example, family influences in childhood and innate someone from birth. A person's character is formed because of the habits on does, the attitude taken in response to the situation, and the words spoken to others. This character eventually becomes something that sticks to a person and often the person concerned is not aware of his character. Other people are usually easier to judge a person character. A person habits are formed from actions that are repeated every day. These actions are initially conscious or intentional, but because so often the same actions are carried out, in the end often these habits become reflexes that are not realized by the person concerned. For example: gait, body movement when speaking in public or language style.

People take action because they want to do it. From persistent desire finally what is desired is done. The emergence of desire in someone is driven by a thought or something. There are many things that can trigger the mind whose information comes from the five senses. For example, seeing something makes people think, hearing something makes people think and so on.

Definition of Character Education

According to the National Education System Law, article 1 of 2003 states that one of the goals of national education is to develop the potential of students to have intelligence, personality, and noble character. So that education does not only from intelligent Indonesian people, but also has personality or character. Thus, a generation of nations is born that grows and develops with characters that breathe the noble values of the nation and religion. According to Albertus (2010: 100), character education is able to become the driving force of history towards the aspired golden Indonesia. In character education, humans are seen as able to overcome determination outside them with a value that is valuable and worth fighting for, he can overcome his limitations, thus, the values that are believed by individuals that are embodied in decisions and actions become the driving force.

From an Islamic perspective, character education can be defined as a conscious and planned effort to shape, direct and guide the morals of students in daily life in accordance with Islamic teachings sourced from the Koran, hadith, and ijihad. Even Rasulullah SAW was sent to be the best example for humans (QS. Al-Ahzaab:31), because he has a great character (QS. Al-Qalam:4). According to Muslim Nurdin, et.al. (2001:205), character education in an Islamic perspective is moral education. Moral

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comes from the word *khalafa* with the root word *khuluqan* (Arabic) which means war, character, custom, or from the word *khalqun* (Arabic) which means event, creation, or creation. So, etymologically, morals, manners, customs, habits, or systems of behavior are made. Morals can be good or bad. Good morals are called good morals and bad morals are called *madzmumah* moral. However, in Indonesia the word morality always has a positive connotation. Good people are called moral people and people who do bad things are often called people who have no morality.

According to Zubaedi (2012:65), character education has a general meaning, namely the formation of character that is carried out by all people, both Muslims and other religious people. However, the difference is not a reason to be contested. Character education is based on the basic human character that comes from universal moral values (absolute) of religion, which is also known as the golden rule. Character education has a definite purpose, if it is based on these basic character values. According to psychologists, some of these basic character values include love for Allah SWT and his creation (nature and its contents), responsibility, honesty, respect and courtesy, compassion, caring and cooperation, self confidence, creativity, hard work and abstinence, surrender, justice and leadership, kindness and humility, tolerance, love of peace, and love of unity.

The implementation of character education in schools must be based on basic human character values. Furthermore, it is developed into more or higher values (which are not absolute, relative) according to the needs, conditions, and school environment. Character education in schools, all components must be involved. These components include the curriculum, learning and assessment process, handling or managing subjects, school management, implementing co curricular activities, empowering infrastructure, financing, and the work ethic of all school members or the environment. According to Sudrajat (2011:45), character education is an effort that is designed and implemented systematically to help students understand the values of human behavior related to God Almighty, oneself, fellow human beings, the environment and nationality which is manifested in thoughts, attitudes, feelings, words and action based on religious norms, laws, etiquette, culture and customs.

Character education is a planned process to shape, direct and guide the behavior of students in everyday life in accordance with the norms prevailing in society. These norms regulate the pattern of human attitudes and actions wherever they are. In these norms there is a value system. If it is interested in an Islamic context, the value system is Islamic teachings with the Al-Qur'an and Hadith as the source of its value and *Ijtihad* as a method of Islamic thinking. The pattern of attitudes and actions resulting from the Islamic values system in question includes relationship with Allah SWT, fellow humans and with the natural surroundings.

Character Education Goals

The purpose comes from the root word to aim, the verb is towards which means to go in the direction and to lead and to make a purpose (target, direction). That is why the goal is defined as a direction, something to aim for and achieve. The purpose of character education is to inculcate values in students and to renew the order of living together that values individual freedom more. Its long term goal is to base itself on an individual's active contextual response to the natural social impulses it receives, which in turn sharpens the vision of life that will be achieved through an ongoing formation process. This long term goal is a dialectical approach that is closer to the ideal reality, through a process of continuous reflection and interaction between idealism, choice of means and direct results that can be evaluated objectively.

According to Nurchaili (2010:55), it is very important to plant character education as early as possible. Because with good character, we can do things that are proper, good and right so that we can take part in life success, harmony among others and be in the corridor of good behavior. On the other hand, if we violate it, we will experience uncomfortable things, from light ones, such as not being liked, not being respected by others, to serious ones such as breaking the law. Character education also aims to improve the quality of implementation and educational outcomes in schools that lead to the achievement of the formation of character and noble character of students in a complete, integrated and balanced manner in accordance with graduate competency standards. Through character education, it is hoped that students will be able to independently improve and use their knowledge, examine and internalize and personalize character values and noble character so that they are manifested in daily behavior.

According to Majid (2013:108), the main goal of education which has been neglected or may have failed to be achieved is the formation of character. This neglect or failure can be seen from various things. Children are not polite to their parents and older people, care less about others, dirty words that are far from ethics, disputes and brawls between students, promiscuity, smoking and drugs are common things that we often see and find anywhere. Therefore, to improve the morality and character of students, character education should be implemented. The internalization of character education will increasingly indirectly become a force to select and filter any challenges that come from outside, whether in the form of western culture, community values, and thoughts that pass before humans through print and electronic media. The war of thought, culture, economy,

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morals, and values is happening so fiercely in today's era of open competition, so that tough and consistent individuals and communities are needed to live up to the sacred and noble values that they believe in.

These great values will become transformer figures to inspire and motivate people to preserve and fight for great values that are believed to be true, as well as dynamic and progressive in developing these values so that they are always relevant to contemporary challenges that require continuous adaptation, contextualization, and revitalization processes. Character education is very important because of its strategic position in pumping the human spirit in preserving and fighting for these great values. For this reason, character education is expected to be able to produce and display a generation that not only has intellectual intelligence, but also has emotional and spiritual intelligence and has a personal character who always tries to maintain his development by improving the quality of moral faith, relationships between fellow humans and realizing the motto of a happy life, the world and the hereafter.

The Urgency of Character Education

Character education is an urgent need considering that demoralization and degradation of knowledge have become increasing in acute affecting this nation at all levels of society. Character education is expected to be able to raise the awareness of this nation to build a solid national foundation. Through the Ministry of National Education, the government has launched the implementation of character education for all levels of education, from elementary to university. The emergence of the idea of character education programs in the world or education in Indonesia is understandable, because so far it is felt that the education process has not succeeded in building Indonesian people with character. Many say that education has failed to build character. Many high school graduates and scholars are good at answering exam questions and are intelligent, but mentally weak and timid, and their behavior is not commendable. This is what urges the birth of character education. Many research result prove that character can affect a person's success.

Among them, the result or research at Harvard University, United States in Asmani (2013:78), which states that it turns out that a person's success is not determined solely by knowledge and technical abilities (hard skills), but by the ability to manage oneself and others (soft skills). This research reveals that success is only determined about 20% by hard skills, and the rest (80%) by soft skills. In fact, the most successful people in the world can succeed because they are supported by soft skills rather than hard skills. This *implies* that the quality of student character education is very important to improve.

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Therefore, educational institutions must determine the standard demands on the character that will be offered to students as part of their institutional performance; d. priority praxis, another very important element for character educational is evidence of the implementation of the priority values of character education. In connection with the demands of educational institutions on the priority values that become the vision of the their educational performance, educational institutions must be able to verify the extent to which the schools vision has been realized within the scope of scholastic education through various elements that exist within the educational institution itself; d. reflection, the character that educational institutions want to shape through various programs and policies always needs to be evaluated and reflected on continuously and critically. Because, as Socrates said, "A life that is not reflected is a life that is not worth living". Without an effort to look back at the extent to which this reflected and evaluated, there will never be progress. Reflection is this conscious ability, humans are able to cope with themselves and improve their quality of life better. So, after the actions and praxis of character education have taken place, it is necessary to conduct a kind of deepening and reflection to see the extent to which educational institutions have succeeded or failed implementing character education. Humans are able to cope with themselves and improve their quality of life better. So, after the action and praxis of character education have taken place, it is necessary to conduct a kind of deepening and reflection to see the extent to which educational institutions have succeeded or failed in implementing character education. Humans are able to cope with themselves and improve their quality of life better. So, after the actions and praxis of character education have taken place, it is necessary to conduct a kind of deepening and reflection to see the extent to which educational institutions have succeeded or failed in implementing character education.

The character education methodology is an important note for all parties, especially teacher who interact directly with students. Of course, these five things are not the only ones, so each of them is challenged to present alternative thoughts and ideas to enrich the character education methodology that this nation desperately needs in the future.

Strategy of Internalizing Religious Values in Character Building

The character education methodology is an important note for all parties, especially teachers who interact directly with students. Of course, these five things are not the only ones, so each of them is challenged to present alternative thoughts and ideas to enrich the character education methodology that this nation desperately needs in the future. Likewise, the internalization of religious character also has systematic method. There are many methods that can be used by teachers, principles, and schools in internalizing the religious character of students. It is hoped that with a strategy that is suitable for the child's religious character, it can be achieved to the maximum. One thing that teachers need to pay attention to in presenting religion to children is that it must be in accordance with the growth of the child's soul, in a more concrete way.

Integration through School Management

The character education methodology is an important note for all parties, especially teachers who interact directly with students. Of course, these five things are not the only ones, so each of them is challenged to present alternative thoughts and ideas to enrich the character education methodology that his nation desperately needs in the future. Likewise, the internalization of religious character also has a systematic method. There are many methods that can be used by teachers, principals, and schools in internalizing the religious character of students. Then from these methods various strategies for internalizing religious character can be developed. It is hoped that with a strategy that is suitable for the child's religious character, it can be achieved to the maximum. One thing that teachers need to pay attention to in presenting religion to children is that it must be in accordance with the growth of the child's soul, in a more concrete way.

Integration through School Management

Management implies the use of resources to achieve goals. Resources are elements in management, namely humans (*man*), materials (*materials*), machines or equipment (*machine*), methods or ways of working (*methods*), money capital (*money*), and information (*information*). Resources are limited so that the task of management must manage limited resources efficiently and effectively so that goals are achieved. The management process is a continuous process, starting from planning and making decisions (*planning*), organizing the resources owned (*organizing*), applying leadership to mobilize resources (*actuating*), to implementing control (*controlling*). This process is often referred to as the POAC (Planning-Organizing-Actuating-Controlling) concept, which originated in the west. This is different from the Japanese approach, known as the PDCA (Plan-Do-Check-Action)

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approach. The contextual on the world of educations, which is meant by education Management is a process of planning, implementing, and evaluating education in a effort to produce graduates who are in accordance with the vision, mission, and goals of education itself.

Table 1. Indicator of School and Class Success in Instilling Religious Character

School Indicator	Class Indicator
a. Celebrating religious holidays	a. Pray before and after the lesson
b. Has facilities that can be used for worship	b. Provide opportunities for all students to carry out worship
c. Provide opportunities for all students to carry out worship	

According to the Ministry of National Education, the success of failure of schools and classes in instilling values is measured by the indicators as shown in table 1. If a school and class has met the above indicators, it can be stated that the school and class have succeeded in instilling religious character values, to the students. Character education in schools is also closely related to school management or management. The management in question is how character education is planned, implemented, and controlled in educational activities in school adequately. The management includes, among others, the values that need to be instilled, curriculum content, learning, assessment, educators, and education staff, as well as other related components, in character education into the existing school curriculum, syllabus, and learning program plans (RPP). As for the implementation of character education through self development and habituation, what Kurniawan mentioned is written in table 2, regarding the implementation of character education in the following school curriculum. :

Table 2. Implementation of Character Education in School Curriculum

No.	Implementation of Character Education	Form of Activity Implementation
1	Integration in existing subjects.	Develop syllabus and lesson plans on existing competencies in accordance with the values that will be applied.
2	Subjects in local content (Mulok).	Determined by the school/region. Competencies are developed by the school /region.
3	Self development activities	<ul style="list-style-type: none"> a. Cultivation and habituation, in the form of, conditioning, routine activities, spontaneous activities, exemplary, and programmed activities. b. Extra curriculum activities, such as scouts, PMR, UKS, KIR, honestly canteen, sports, arts and so on. c. Counseling guidance is the provision of services for children who have problems.

Habituation is an activity that is carried out repeatedly to achieve a change in behavior. Of course, this behavior change is a good behavior. The change in good behavior then becomes the goal to be achieved in habituation activities. There are three forms of habituation activities that can be carried out, as follows:

Regular Habit

Routine activities are activities carried out by students continuously and have been carried out every day. Routine activities carried out every day can be used as a habit in internalizing religious character in students. Routine habituation is a habituation activity that is carried out on a programmed or scheduled basis. It can be carried out in one daily, one weekly, one month one semester, even one year activity. In the opinion of Kurniawan (2013:129), revealed that religious activities can be taught to student in schools which can later be used as habits, namely; a. pray or give thanks. Prayer is an expression of gratitude to God. Expression of gratitude can also be realized by establishing brotherly relations among friend without discriminating against ethnicity, race, and religion; b. organizing activities at the mosque. Activities that can be carried out are for example zuhur prayer in congregation every day, participating in Qurban recitation activities together, and congregational Friday prayers; c. Organize religious holidays.

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For those who are Muslim, for example, holding religious activities such as recitations at the moment of *Eid al-Adha*, *Eid al-Fitr*, and *Isra Mi'raj* as a means of increasing the faith and piety of students. This routine activity is important for teachers to do to shape the habituation of student's attitudes and behavior to suit their religious character. Because with the habituation of religious character can be internalized in the soul of the child. So when the child does not behave in accordance with the character, then he will feel guilty and uncomfortable.

Spontaneous Habituation

Spontaneous habituation is a habituation activity that is not programmed. In other words, spontaneous habituation is a habituation activity that is carried out incidentally in certain situations or when students display certain behaviors (either good behavior or bad behavior). The forms of spontaneous habituation include the following: a. giving gifts in the form of material (goods, materials) and non-material (praise, smiles, congratulations, etc.) for good behavior displayed by students in a situation. For example, teachers are used to giving praise to students who come to school early ; b. Giving punishment or warning and advice to students who do bad behavior. For example, teachers are accustomed to giving punishment to students who violate school rules to provide a deterrent effect so that students do not violate them again. The teacher's habit of giving rewards and punishments for various behaviors displayed by students can be used as a medium to teach which actions should be taken and which actions should not be done in character education practice.

Habituation Exemplary

Exemplary habituation is a habituation activity carried out by teachers to always provide real examples of good to their students. The example in question is all the behaviors and attitudes carried out by school supervisors, principals, and school employees in providing examples of good actions, so that they can become good models for students. The teacher is a figure who is admired and imitated for students and the community. This means that teachers must be able to be role models for their students. In fact, there are those who think that the success of teachers in shaping the character of their students will be greatly influenced by their ability to get used to providing examples for their students.

Teachers exemplary is very important for the effectiveness of character education. Without example, character education loses its most essential spirit, only slogans, camouflage, mirages, and other negative words. Exemplary is easy to say, but hard to do. Because, exemplary is born through a long educational process, starting from material enrichment, reflection, appreciation, experience, resilience, to consistency in actualization. Education is experiencing a crisis of exemplary. This is what causes the degradation of knowledge and moral decadence to become acute in this country. Many teachers whose attitudes and behavior cannot be example for student. They have lost a mentor they can admire and emulate. Finally, they are wild in expressing freedom. There was a moral crisis. Their idols were stars who liked to flaunt their beauty beyond limits. Furthermore, nowadays, many students have become men's ideal women because of the influences of cultural globalization which is perverted and misleading.

Teachers and parents also need to have assertive skills and listening skills. Assertive skills are the skills to express opinions openly, in ways that do hurt the feelings of others. The value exemplary method has implementation strategies, the value exemplary strategy includes: sharing feelings, sharing experiences, sharing skills, resources persons, and avoiding hypocrisy.

Role of Family Environment

The family environment is the smallest unit of society consisting of the head of the family and several people who gather and live in on place under one roof in a state of interdependence. The family environment is the main pillar to shape the good and bad of the human person in order to develop well in ethics, morals, and morals. The role of the family can shape the pattern of attitudes and personality of children can also determine the educational process that children get, not only at school but all factors can be used as sources of education. The family environment can also play a role as a source of children's knowledge, it can also affect the success of student achievement. The family function is an educational function where the family is the best vehicle in the process of socialization and education for children. The family becomes a vehicle for educating, nurturing, and socializing something to children, developing the abilities of all its members so that they carry out their functions in the community well and prosper.

Family is an important aspect to instill character in children so that children so that children have good character, especially parents, are the main educators who play an important role in shaping the character of children who always strive to educate their children, both in the cognitive field and also in educating values and morals. The family is the first and foremost place for children's growth and development. The basis of character education should be applied from childhood or what psychologist call the golden age, because this age has been proven to greatly determine a child's ability to develop his potential.

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About 50% of the variability of adult intelligence occurs when the child is 4 year. The next 30% increase occurs at the age of 8 years, and the remaining 20% in the middle or late second decade. From here, character education should start from within the family which is the first environment for the growth of children's character.

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Family is an important aspect to instill character in children so that children have good character. Families, especially parents, are the main educators who play an important role in shaping the character of children who always strive to educate their children, both in the cognitive field and also in educating values and morals. Character is also included in the material that must be explained to students. Character education in the school environment should bring students to cognitive value recognition, affective value appreciation, and finally to real value practice. Therefore, character education that has existed in the school environment needs to be immediately reviewed and alternative solutions are sought, and need to be developed more operationally so that it is easy to implement. Character education in the school environment can be integrated into learning in each subject. Learning materials related to norms or values in each subject need to be developed, made explicit, and linked to the context of everyday life. Thus, learning character values is not only at the cognitive level, but also touches on internalization and real experiences in the daily lives of students in society.

The Role of the Community Environment

The community environment is an important part, because after children are educated in the family and school environment, they will live in the community. As a non formal education environment, the community should also play a role in the implementation of the character education process. Every individual as a member of the community must be responsible for creating a comfortable and supportive atmosphere. In children's education, parents should choose an environment that supports children's education and avoids a bad community environment. Because, a child or student is in a bad society, the development of the child's character or personality can become less good. Parents must choose a healthy and suitable community environment as a place to live for parents and their children. Likewise, schools as a formal education environment, also need to choose a good community environment so that they can support the educational process.

According to Salim (2012:271), the importance of the role of the community as a center for character means that every individual as a member of society must create a comfortable atmosphere for the continuity of the educational process that occurs in it. In Indonesia, the concept of community based education is known as a effort to empower the community in providing education. Although this concept is more often associated with schools as formal education, the existence of this concept also shows that public awareness is needed, and its existence is very influential, towards the implementation of education in schools. In the implementation of character education, an integrated character education center is needed, namely the family, school and community environment.

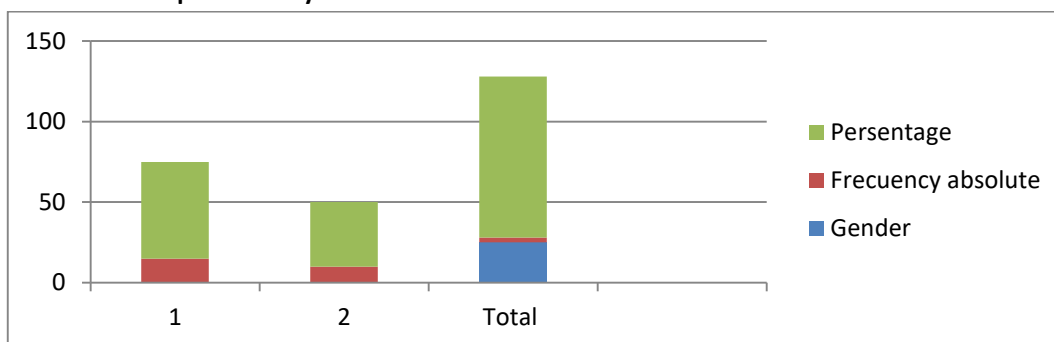
RESEARCH FINDING

Description of Research Site, SD Lab School FIP-UMJ South Tangerang, Indonesia, is a pilot project school for the Ministry of Education and Culture's character education strengthening program. So that this school has implemented character that has a positive impact on the students of SD Lab School FIP-UMJ. Through daily habits carried out through superior programs SD Lab School FIP-UMJ is committed to educating and fostering students to become individuals of character so that all learning activities, both intra curriculum, co-curricular and extra-curriculum are directed at building the character of students who are religious, nationalist, independent, mutual cooperation, and integrity. The school situation is very supportive for the

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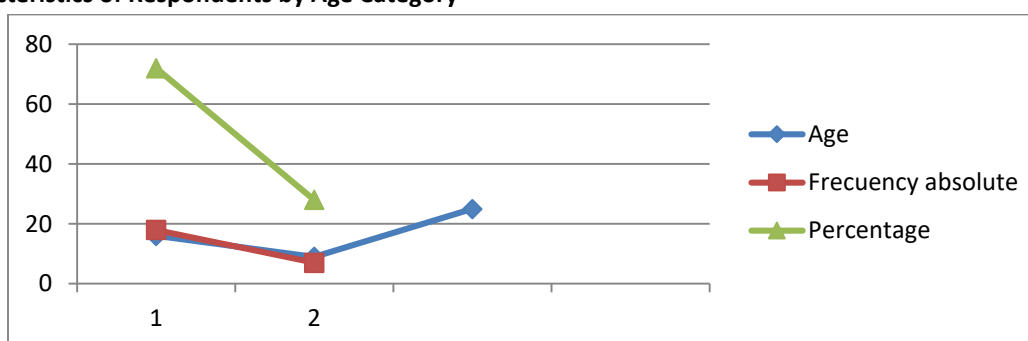
internalization of religious values is character building in students. This is supported by the existence of various activity program held by teachers and schools that are thick with religious elements and are supported by the availability of school facilities used to implement the program. The following are the names of the informants from interviews conducted by researches, namely as follows:

Graph 1. Characteristics of Respondents by Gender



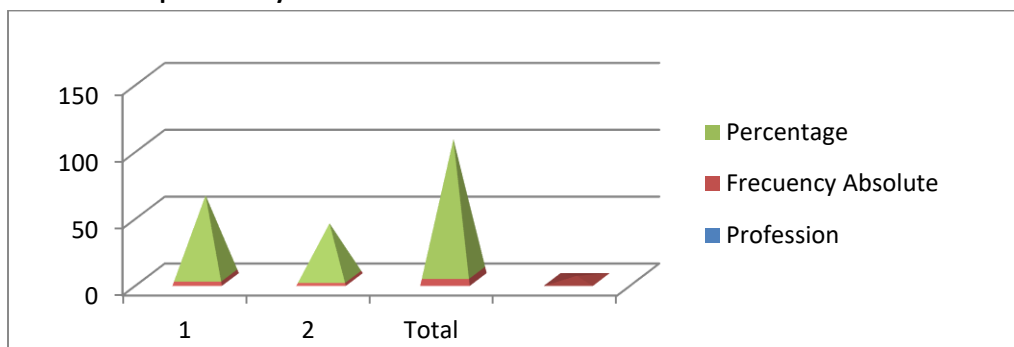
The data above shows the characteristics of the respondent's gender, which consists of 1 male, namely Mr. DR as the head of the school, and 2 women namely Ms. EP as homeroom teachers for class 4.1 and Ms. RF as students vice principal. The percentage obtained is 33.3% for male respondents and 66.7% for female respondents. The following are the characteristics of respondents based on age as follows:

Graph 2. Characteristics of Respondents by Age Category



The data above shows the characteristics of respondents based on the age category of children in grade 4. This category is divided into 2, namely the 9 year age category, and the 10 year age category. In the 9 year age category there are 4 children, and the 10 year age category there are 3 children. The percentage of numbers in the 9 year age category showed 57.1% and 42.9% for the 10 years age category. Respondents data are presented based on the type of work, as follows :

Graph 3. Characteristics of Respondent by Gender



The result of the data collection above show the number of characteristics of the respondent based on the type of work of the guardians of grade 4.1. The table above shows that there are 2 types of work for the guardians of grade 4.1 students, namely housewives and civil servants (PNS). With the percentage of data for each type of work, 60.0% is the percentage for the type work for housewives and 40.0% for the type of work for civil servants.

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DESCRIPTION OF RESEARCH RESULTS

The value of Internalized Religious Character, based on the results of the study, it was found that several activity program in SD Lab. School FIP-UMJ, South Tangerang, Indonesia, including the flagship program, namely character based education where SD Lab. School FIP-UMJ South Tangerang, Indonesia, is committed to educating and fostering students to become individuals with character, so that all learning activities, both intra curricular, co curriculum, and extra curriculum are directed at the formation of student's religious, nationalist, independent, mutual cooperation, and integrity character. The habituation program is a routine activity carried out outside the Teaching and Learning Activities (KBM) which is carried out every day.

Broadly speaking, the habituation program at SD. Lab School FIP-UMJ, South Tangerang, Indonesia, is divided into three, namely, morning habituation which includes the movement to welcome students, *dhuha* prayer in congregation, *tadarusan*, morning journal, student appointments, memorizing *murojaah*, and controlling worship books. Then there is the afternoon habit which includes washing hands before eating, praying before and after eating, praying in and out of the bathroom, praying dzuhur in congregation, and closing prayer. Religious character values that are internalized in SD Lab School FIP-UMJ include tolerance, anti bullying, discipline, love to pray, always grateful, greeting, responsibility, and religious values are also applied by loving and protecting the environment.

This is based on the results of an interview with Mr. DR as the principal of the SD Lab School FIP-UMJ, as follows: there are so many religious values, the sub values include tolerance (respect for differences in religion, ethnicity, and race) including tolerance as well as respecting one's physical differences because we (Lab School) are inclusive schools. For example, there are students with disabilities who cannot walk, mean needing help, how the student appreciates, helps, and so on. Then again the values of anti bullying or anti-violence, so we (Lab. School) than God this school can be said to be zero bullying, there is no bullying, especially bullying which is usually done between upperclassmen and under classmen. No one in 6th grade goes into the lower class, it doesn't exist. Always pray when you are about to start or after something, always be grateful for what Allah has given you. Then also the religious character that is applied by loving and protecting the environment is one of the religious characters too, so how can children be taught to water the plants every morning".

Internalization of religious character through self development programs in SD Lab. School FIP-UMJ is carried out by extracurricular activities. There are lots of extracurricular activities at SD Lab. School FIP-UMJ. Based on the results of observations made by researches self-development activities for elementary school students. Lab. School FIP-UMJ through extracurricular is held every Wednesday. So in a week of teaching and learning activities at school, there is that is used only for extracurricular activities, which is always carried out every Wednesday from morning to evening for the self development of elementary school students Lab School FIP-UMJ.

School Routine Activities

Based on the results of the interview with Ms. EP, the implementation of the process of internalizing religious values in the formation of student character at SD Lab School FIP-UMJ is programmed in the habituation program ini routine school which is carried out outside of Teaching and Learning Activities (KBM) and takes place every year. There is habituation in the morning which includes morning journals, *dhuha* prayer in congregation, reading Pledged, and reading *Iqro/Al-Qur'an*. The implementation of routine student activities in the morning habituation was the congregational *dhuha* prayer which was carried out in their respective classes, then after the *dhuha* prayer there was a *tadarus* habituation (reading *Iqro/Al-Qur'an*), after the *tadarus* there was a morning journal where the students lined up in front of the students. Class to read the student's promise (Pledge) followed by singing the national anthem and then closed with memorizing *murojaah*.

Spontaneous Activities

Spontaneous activities are habituation activities that are not programmed. Spontaneous habituation is habituation activities that are carried out incidentally in certain situation or when students display certain behavior. Based on the results of an interview with Ms. RF as student representative at SD Lab. School FIP-UMJ, she said that: "Besides praying, the children are also accustomed to *salaam* to the teacher, continue to say greetings and maintain speech. Usually if there are children who speak words that are not good, because it has been accustomed from the beginning of the establishment of the Lab School from Mrs. Echi at that time, it is not permissible to use the word *loe-gua* as well as getting used to when we see her friends make mistakes or something is inappropriate, we usually do I'm sorry, I'm used to it from the very beginning of Lab School. The following are the results of student attitudes that emerged through spontaneous activities which are presented in the table as follows:

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Table 3: Student Efforts and Attitudes through Spontaneous Activities

No.	Effort	Developed Value	Student Attitude
1	Reprimand students who did not immediately carry out worship.	Worship	All students want to immediately pray, when the teacher is reminded.
2	Give praise to students	Worship	Students want to say istighfar when they do something wrong, because they are afraid of Allah.
3	Give advice to students who make mistakes.	Worship	Students are happy when they get praise from the teacher.
4	The teacher participates in prayer activities before and after the lesson	Worship	Students want to imitate the teacher when praying with a solemn attitude. Students want to imitate the teacher by following reading and tadarus.
5	The teacher follows or participates in observing the activities of the dhuha and dzuhur prayers in congregation	Worship	All students participate in praying together.

Giving Exemplary

Giving exemplary is a habituation activity carried out by teachers to always provide examples of good deeds to their students in real terms. This means that teachers must be able to be role models for their students. So the method used in the Lab School is how children have good habits, of course the first is an example, especially the example of a teacher, how a teacher respects his students, how a teacher loves cleanliness is an example of an example. So it is only exemplary that can shape the character of students, religious character itself when the dhuha time the teacher joins the dhuha prayer, when reciting the Koran and becomes a student mentor, when the midday prayer, the teacher joins the midday prayer, it is an example”.

Extracurricular activities are educational activities outside of subjects and counseling services to assist the development of students according to their needs, potential, talents, and requests through activities that are specifically organized by capable and authorized educators and/or educational staff in schools. Integrated character education in learning is the introduction of values, gaining awareness of the importance of values, and internalizing values into student’s daily behavior through the learning process, both in the classroom and outside the classroom in all subject. These value are included in the syllabus and lesson plans. Learning materials related to norms or values in each subject need to be developed, made explicit, and linked to the context of student daily lives. Thus the learning of character values is not only at the cognitive level, but comprehensively at the internalization, real experience data in the daily lives of students in society.

Internalization of religious character through internalization in learning in SD Lab. School FIP-UMJ just goes on every ongoing learning process, this was also stated by Ms. EP as a grade 4teacher in her interview, as follows: “It just works, so we (Lab School) is already used to it and it’s a habit, so friends (students) do it without being asked and it runs as usual. Religious Characters Listed in the Syllabus. Based on the results of the interview with Ms. EP as a grade 4.1 teacher, the internalization of religious values in character building was included by the teacher in the learning syllabus. SD Lab. School application of religious values. Read a prayer before starting the lesson, then give thanks for what God has given, all of which is stated and written in the lesson plans and syllabus”, based on the results of the research’s documentation the syllabus that the teacher uses comes from the government so that the teacher just need to develop the syllabus into the learning process.

Religious Characters Written in RPP

Based on the results of the interview with the EP teacher as homeroom teacher for class 4.1 as shown in the description of the research results above, the teacher has included religious values in the formation of students character in the lesson plans, in the formation of characters already listed in the lesson plan at point D the expected student character. In the RPP the expected student characters are listed not only religious characters but also other characters such as nationalist, independent, mutual cooperation and integrity and many others.

Initial Activities, Core Activities, and Closing Activities, Based on the result of an interview with the EP teacher as homeroom teacher for grade 4.1 regarding how EP had internalized religious values into learning activities at school, Ms EP stated : “It just works, so we (Lab School) are already used to it and it is a The habit of being friends (students) does it without being asked and has run as usual. Already accustomed, “So based on the results of the interview with Ms. EP that during the

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learning process in the classroom by internalizing religious values in the formation of students it just goes because the students are already used to it, this is a habit so students do it without being asked and it runs as usual.

Interpretation of Research Results

From an Islamic perspective, character education can be defined as a conscious and planned effort to shape, direct, and guide the morals of students in daily life in accordance with Islamic teachings originating from the Koran, hadith, and Ijtihad. In the perspective of Islamic education, character values are widely studied in moral education. Even the Prophet Muhammad was sent to be the best example for humans (Surah Al-Ahzaab:21), because he has a great character (Surah Al-Qalam:4). The greatness of the personality of the Prophet Muhammad has been integrated into daily behavior and activities which are reflected in four characteristics: *sidiq (true)*, *amanah (trustworthy)*, *tabligh (delivering the truth)*, and *fathonah (wise)*. These four traits are the big umbrella in character education, meaning that the values of character and national culture are the essence education, which is the embodiment of the four traits and characters of the Prophet Muhammad as described above.

Religious character education is an important foundation or foundation instilled in children from an early age. Religious character is the foundation in building a child's character, if the religious character is good, the other characters will also be good. Seeing the importance of character education, especially religious values in forming the character of students, it must be carried out and applied to students as early as possible so that it becomes a solid foundation for students so that in the future they are not easily carried away by the negative impacts of globalization and the negative impact of socializing trends.

CONCLUSION

Based on the results of the study, it can be concluded that the internalization of religious values in the formation of the character of elementary school students. Lab School FIP-UMJ South Tangerang, Indonesia as follows:

1. Strategies for internalizing religious values in character building of elementary school students SD Lab School FIP-UMJ South Jakarta, Indonesia, has been carried out and implemented well through the implementation of activities and habituation in SD Lab School FIP-UMJ. The internalization efforts made by the teacher, the attitudes of students that are formed, and the behavior of students that arise. The example of teachers that are formed, and the behavior of students that arise. The example of teachers participating in religious activities such as *dhuha prayer* in congregation, *dzuhur prayer* in congregation, praying before and after lessons and students *tadarus* activities that are formed are imitating the behavior that teachers do in participating in religious activities. The behavior that emerges is that students participate in praying with a good attitude.
2. Internalization of religious values in character building of students at SD Lab. School FIP-UMJ South Tangerang, Indonesia through learning activities in schools contained in the syllabus and lesson plans, school management as an educational system in character education which will then be managed through areas of planning, implementation, and control. And through extracurricular activities that exist in schools to help develop students according to their needs, potential, talents and interests through activities that are specifically organized by educators and/or educational staff who are capable and authorized at the school.
3. The role of extracurricular in the process of internalizing religious values in the formation of student characters has a fairly important role in the process of forming student character. Because, extra curriculum that are professionally designed can be in children, forming winning characters in children, and the greatest place of actualization that children are waiting for all the time.

SUGGESTION

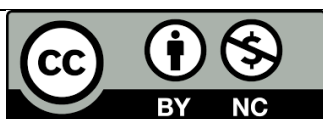
Based on the conclusions, the suggestions that can be submitted by researchers are as follows:

1. Applications that are carried out must be more effective so that good habits emerge. Through habituation activities that are applied effectively, it can help the formation of children's character.
2. The learning in the syllabus and lesson plans should be designed effectively and appropriately so that the formation of children's character through learning activities can run optimally and well.
3. Extracurricular activities in schools should not only be mediocre in design, unattractive, monotonous, become a burden for children, have no recreational and restorative value, and cause headaches and burdens for children. This must be avoided and becomes a challenge for school principals in empowering this extracurricular maximally, effectively, and productively for the development of children's character.

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The Importance of Mathematics in the Digital Age



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ABSTRACT: There is a well-known statement by A. Einstein that there are two ways to live this life. The first, to consider that miracles do not happen, the other, to consider that everything around is a miracle.

These words can be paraphrased in relation to mathematics. There are two ways of thinking: some believe that mathematics is necessary in all spheres of human activity and that it teaches the brain to think logically, thereby helping to put both human thoughts and activities in order. Others, on the contrary, believe that mathematics is out of date and that high-tech machines are gradually taking its place. Which one is right? The article attempts to reflect on this topic.

KEY WORDS: mathematics, digital technology, digitalization of the economy, education, academic training, teaching mathematics, exam, rationality, irrationality, STEM, the modern world.

INTRODUCTION

The end of the XX and the beginning of the XXI century was a period of active implementation of digital technologies (DT) in any sphere of human activity. Today, it is almost impossible to find an industry in which digital technologies are not involved. Despite the proven effectiveness of the use and practicality of utilizing digital technologies, most people and even specialists, when using absolutely all types of modern digital technologies, have an idea that mathematical skills are unnecessary and ineffective.

Even among certain scientific circles, the opinion has arisen that classical mathematics, which is taught in universities, no longer corresponds to modern trends in the development and implementation of DT. Allegedly, the existing courses of classical mathematics are viewed by students as too abstract and irrelevant. And this phenomenon hinders effective preparation for the conditions of the modern labor market. Most experts believe that a large gap has formed between the modern realities of using mathematics in DT and teaching classical mathematics in educational institutions [1].

THE MAIN FINDINGS AND RESULTS

According to Dutch experts, mathematical skills are no longer in demand and a priority criterion when applying for a job, even with the constant use of DT [2].

But, as usual, there is also the opposite opinion on this matter. For example, Honorary Professor of Mathematics Lynn Arthur Steen noted: "School mathematics is difficult, but used in simple problems, while mathematics at work is simple, but used in complex problems" [3].

Experts from the STEM (Science, Technology, Engineering, Mathematics) development program, as a result of their research, have concluded that many of the math skills taught in universities are never used by students in their work, especially when using DT.

However, most studies have shown that specialists who freely apply elements of techno-mathematical literacy that are acquired during academic study at universities, and are guided by it when processing text, numerical and graphic data, do better in their careers than people who independently study these programs. The study looked at a wide range of professions, ranging from technical consultants to specialist engineers.

It is known that in the origins of all digital technologies' functioning are simple mathematical signs and operations, introduced into the system more than 60 years ago. Take, for example, Arabic decimal digits (0,1,2,3,4,5,6,7,8,9), which, when performing various arithmetic operations, effectively provided the result of actions. Thanks to digitalization, it became possible to convert these numbers into letters, and later into whole texts. Then these seemingly "simple" mathematical symbols and operations were used to convert numbers to colors, various sounds, and images, etc. thus, 3D, 4D, 5D effects appeared.

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Scientists, through the interaction of elements of logic, mathematical operations and symbols, have invented a platform for creating computer programs. They began to perform matrix operations and translate functional elements of programs into various codes, such as 11000100, 0110111110, 00101100, etc. This helped specialists to find a way to encrypt a large amount of information and place it compactly on DT devices [4].

These schemes have become fundamental in the development and improvement of digital technologies. Later, the system was improved, the programs became more complicated, and their use, on the contrary, was simplified. Accordingly, the initial mathematical operations also became more complex. Over the past 60 years, these "ordinary", "simple" mathematical operations and symbols used in digital technology have contributed to a rapid and dynamic breakthrough in the field of electronics, which, in turn, is reflected in all areas of human activity. This indicates that the role of mathematics in the use of DT has always been, is and will be important. Moreover, it serves as the basis, the foundation for all these DT.

As the mathematician, Attila Egri-Nagu [4] stated: "To automate any device, we break all information into mathematical values, then reverse them, and then represent them in the form of codes and increase their level."

Despite the different opinions on the role of mathematics in connection with the widespread introduction and use of modern digital technologies, mastering the basics of the "Queen of Sciences" significantly improves the working process of each person. Experts believe that the strengthening process of the role of mathematics in the world of DT begins in universities and largely depends on the activities of teachers. Despite the noticeable advantages of automated systems over human labor, there is such a thing as the human factor. In this case, it is a factor of rapid mathematical assessment of the situation, analysis and adoption of necessary and rational measures. Such skills are injected into the minds of students only with the help of teachers. Experts believe that the regular use of the following methods by teachers will arouse great interest among students in the study of the relationship between mathematics and DT:

- immersion into the world of digital technologies and the introduction of new models of DT in the learning process, thereby keeping pace with modern technologies
- development of appropriate didactic strategies based on the widespread use of DT
- interactive interaction with students with the constant use of digital technologies

According to British experts, the use of these techniques contributes to the effective development of the curriculum in mathematics, the elements of which in the long run will allow the students themselves to build a successful career [5]. But the fact is that all these technologies will be only a background for the teacher to explain the topic. The assimilation of the material also requires painstaking mental work from students. After all, the learning process is a double-edged sword. Without feedback, all efforts can be wasted. So the semester exams at the university must be very strict. In a way, even tough. Students who were able to pass all the exams successfully, like a sponge, will absorb new knowledge and the return from them will be appropriate. This is perhaps the first and main condition for the training of good specialists. My many years of experience at the university show that the quality of graduates is strongly correlated with the quality of enrollment in the first year.

In addition, practice is required at enterprises and organizations corresponding to the chosen profession. The presence of practice, where the knowledge gained would be applied, will only increase the interest of students in the subject, will serve as a good motivation for further study. Or the reason for abandoning the wrong profession.

CONCLUSION

Based on the analysis carried out above, it can be argued that the concepts of "mathematics" and "digital world" are inseparable from each other. When it comes to training specialists who will be engaged in the creation of DT, it is natural to talk about which areas of mathematics they should study, and not about giving up the study of mathematics in general.

Generally speaking, the "Queen of Sciences" has proved, is proving and will continue to prove its significance in absolutely all spheres of human activity. As they say – the position obliges.

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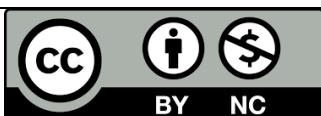
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The Comparison of Highschool Students' Happiness between On-site and Online Learning and its Correlation with Motivation to Learn



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ABSTRACT: Nowadays, with the current COVID-19 pandemic, education is done in the medium of online platforms compared to the typical on-site learning. As a result, this could be a drastic change in learning environments for many. A key component for learning is motivation, which could be correlated with the happiness students experience while learning. This study aims to compare different levels of happiness and motivation to learn between online and onsite settings and to find the correlation between happiness and motivation of students while learning. The data of this study was collected through an online survey, with the participant's consent. The participants were students aged between 14-19, who have both experienced on-site learning and online learning. Participants answered 5-Likert scaled statements regarding happiness and motivation while learning in different settings. Additionally, statements regarding motivation were developed on the basis of the principle basic psychological needs which consists of three components: Autonomy, Competence, and Relatedness. The survey received 253 responses in which the data, the mean, p-value (t-test), and the correlation value were calculated. Analysis of data showed that the mean scores of happiness and motivation of students while learning on-site were statistically higher than those of learning online at the significance level of 95%. Furthermore, the results illustrated that there was a high level of correlation of happiness and motivation to learn in both learning environments.

KEYWORDS: Happiness, Motivation, On-site Learning, Online Learning, Pandemic, COVID-19

I. INTRODUCTION

Technology permits two major mediums of delivering the educational experience to exist. The first is the more widely accustomed traditional on-site learning. This refers to the century-old system of students attending a certain educational institution to be directly instructed by one or more educators in a classroom environment consisting of peers (Baum & McPherson, 2019). It is typical of such constructions to include hands-on activities and face-to-face inquiries among peers, where the activities are not only highly encouraged but are most likely unavoidable (Baum & McPherson, 2019). The second medium is the more recent adoption of electronic devices, which recently gained popularity due to the COVID-19 pandemic. It creates a learning platform that is unreliant of the need for students and instructors to be physically present. However, this online structure is more open-ended in nature, as courses can come at varying paces, depth, and levels of interaction (World Economic Forum, 2020). Oftentimes, courses will utilize the advantage of an online platform to present pre-recorded materials that can be accessed repeatedly at any time and anywhere (Stanford Global, 2020). Therefore, online learning puts a greater emphasis on students utilizing self-motivation to learn.

One study, conducted by Wangwongwiroj and Yasri (2021), compared students' level of perceived self-efficacy on three different modes of education: live courses, online courses, and live online courses. The study established that individual sense of efficacy was influenced mainly by the principle of mastery experience, and other concepts to consider were vicarious experience, verbal persuasion, and psychological state. It was found that the level of mastery experience, vicarious experience, and verbal persuasion was statistically highest in live courses and live online courses, while online courses failed to keep pace. Thus, it was deduced that

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live courses and live online courses had a higher level of contribution to self-perceived efficacy due to the fact that both allowed students to see and consume useful examples from peers and teachers. Overall, it was concluded that the change to online courses could potentially lower the overall level of self-efficacy among students.

This study aims to explore how students' happiness in each of the learning types may correlate to their motivation to learn, where data is gathered through an online survey. Happiness was measured using statements from the Oxford Happiness survey, where happiness could be defined in different ways: participation, mental alertness, the experience of joy, emotional stability, and satisfaction in life. Research has found that it is plausible that participation in families, workplaces, and political systems will increase levels of happiness, where the main source of happiness stems from the action of establishing and sustaining social bonds. Furthermore, other processes that may have contributed include helping others and, in the case of work, the experience of flow from pursuing a strenuous task (Martin & Barker, 2011). However, the study of happiness from participation in a school environment has not been conducted, which can be found in this study.

Scientists at UCLA have found that there was a correlation between happiness and mental alertness, measured through the release of a specific peptide, a neurotransmitter called hypocretin. This peptide greatly increased when subjects were happy but decreased when they were sad, but also elevated alertness in humans when released (Wheeler, 2013). Moreover, further support can be found through a psychology study where it was found that mind-wandering is typically associated with lower mood. The same correlation between mind wandering and lower mood was also concluded in previous studies (Franklin et. al, 2013). Moving on to the experience of joy, psychologist Rachel Fearnley described joy as a measure of contentment and happiness in everyday life that is not tied to external factors which is much less transitory than other forms of pleasure (Psychologies, 2020). Emotional stability is associated with being in control of thoughts and actions which generally lead to higher self-esteem, self-competence, and overall happiness (AMFM, 2020). Lastly, according to Daniel Gilbert, professor of Psychology at Harvard University, satisfaction in life refers to the overall contentment that an individual has with their overall life which induces a type of happiness that is stable and long-lived (Ackerman, 2021). Conclusively, this study's survey on the happiness category is aimed at these concepts.

Motivation is measured through the theory of basic psychological needs. The theory is universally accepted to be crucial not only for psychological well-being but also for autonomous motivation (Deci and Ryan, 2000). Accordingly, statements are split into three sections: autonomy, competence, and relatedness. Autonomy describes the human need for a sense of choice and personal decision. Competence, on the other hand, is defined as the ability to control outcomes and gain mastery over a specific environment. Finally, relatedness refers to the need to react with other human beings, specifically through quality and close relationships (Deci and Ryan, 2012). Thus, basic psychological needs drive human behavior and are necessary for individuals to thrive in their communal environments (Ryan et al., 1995).

II. METHODOLOGY

This quantitative study was carried out to investigate the correlation between the learning environment (on-site, online) and students' happiness and motivation and also aims to find the correlation between happiness and motivation of students while learning. An online survey was distributed to Thai students ages 14-19. A total of 253 responses were received. The survey consists of 22 items, each part (on-site learning, online learning) contains 11 statements for participants to rate Happiness (5 items) and Motivation (6 items). Additionally, statements regarding motivation were developed with consideration of the principle of motivation/ basic psychological needs theory (Wangwongwiroj & Yasri, 2021) consisting of 3 components: Autonomy, Competence, and Relatedness with 2 statements. The statements were developed and verified by 3 experts with an Item-Objective Congruence (IOC) index rating, all the statements have a rating of more than 0.5 (Jusoh, Zubairi, & Badrasawi, 2018). The acquired value of Cronbach's alpha of this survey is 0.879 showing high levels of reliability (Tavako, & Dennickk, 2011). The respondents were informed about the purpose of this study and have acknowledged that answers to the survey will remain anonymous, participation in this study is voluntary and participants can withdraw anytime. The responses included 15.1%, 21.8%, 25.8%, 23%, 11.1%, and 3.2% of students ages 14, 15, 16, 17, 18, and 19 year old respectively. The statements provided to the respondents were answered in a form of the 5-Likert scale, ranging from strongly disagree (scale 1) to strongly agree (scale 5). In order to complete the survey, the participants must choose one answer out of five choices that demonstrate their level of agreement best. Then, the mean, p-value, and value of correlation are calculated. The value of correlation is rated following the scale of correlation (Mukaka, 2012). The data acquired from calculating the mean was used to prove the levels of happiness and motivation students have while learning in different environments. The p-value was calculated to provide statistical proof of the different levels of happiness and motivation between different learning environments.

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Table 1: Happiness and motivation survey items

Statement	Category identified
1. I always participate in-class activities.	Happiness
2. I always feel mentally alert.	Happiness
3. I always experience joy.	Happiness
4. I always feel emotionally stable.	Happiness
5. I am always satisfied with my everyday life.	Happiness
6. I always feel comfortable to freely communicate in class.	Motivation (Autonomy)
7. I always feel comfortable to freely express my ideas in class.	Motivation (Autonomy)
8. I am always able to perform well in my favorite subjects.	Motivation (Competence)
9. I am always confident that I am able to get good grades.	Motivation (Competence)
10. I always have good relationships with my classmates.	Motivation (Relatedness)
11. I always have good relationships with my teachers.	Motivation (Relatedness)

III. RESULTS AND DISCUSSION

Statistical results from the survey based on Happiness and Motivation in general could be concluded from the table that the average happiness and motivation of students while learning on-site is higher than students while learning online

Table 2: Mean and p-value of on-site and online happiness and motivation

Statement type	Mean	p-value
On-site (Happiness)	4.38	0.00
Online (Happiness)	1.93	
On-site (Motivation)	4.41	0.00
Online (Motivation)	2.03	

Table 3: Mean and p-value of on-site and online happiness and motivation and this category is divided into three sections following the principle of motivation, basic psychological needs (Wangwongwiroj & Yasri, 2021): Autonomy, Competence, and Relatedness each with 2 statements.

Statement type	Mean	p-value
Happiness: On-site	4.38	0.00
Happiness: Online	1.93	
Motivation (Autonomy): On-site	4.40	0.00
Motivation (Autonomy): Online	1.90	
Motivation (Competence): On-site	4.40	

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Motivation (Competence): Online	2.20	0.00
Motivation (Relatedness): On-site	4.50	0.00
Motivation (Relatedness): Online	2.00	

The statistical results in this study shows a difference in the mean of Happiness during learning on-site to be drastically higher than learning online. Similarly, the mean of Motivation during learning on-site have a huge contrast compared to learning online in every category (Autonomy, Competence, Relatedness). There is a direct correlation between Happiness and motivation while learning, regardless of the method of education, the correlation between on-site motivation and happiness is at 0.83 and the correlation between Online motivation and happiness is at 0.88.

Table 4: The correlation between motivation of autonomy, competence, and relatedness and happiness while learning on-site and online

Learning environment	Statement	Happiness
On-site	Motivation (Autonomy)	0.76
	Motivation (Competence)	0.72
	Motivation (Relatedness)	0.62
Online	Motivation (Autonomy)	0.79
	Motivation (Competence)	0.73
	Motivation (Relatedness)	0.80

According to Table 4, The correlation between motivation of autonomy, competence, and relatedness and happiness while learning on-site is at 0.76, 0.72, and 0.62 respectively. The correlation between motivation of autonomy, competence, and relatedness and happiness while learning online is at 0.79, 0.73, and 0.80 respectively.

The data reported can be concluded that the mean score of relatedness while learning on-site was statistically the highest ($\bar{x}=4.50$) at the significant level of 95%. On one hand, there were slight differences while learning on-site among scores of happiness ($\bar{x}=4.38$), autonomy ($\bar{x}=4.40$), and competence ($\bar{x}=4.40$). On the other hand, there were also light differences while learning online among scores of happiness ($\bar{x}=1.93$), relatedness ($\bar{x}=2.00$), and competence ($\bar{x}=2.20$). Furthermore, the lowest among the available categories was the mean score of autonomy while learning online ($\bar{x}=1.90$).

Table 4 shows the correlation among the key variables. The most notable features of the table for the present study are the relationships between happiness and motivation (relatedness) while learning online.

The result of research showed that there is a positive and significant relationship between happiness and motivation both learning on-site and online. The result of this research is correspond with researches such as Sheikholeslami and Razavie (2005) about the positive and significant relationship between intrinsic motivation with students creativity; Sheikholeslami and Khayer (2006) about relationship between intrinsic motivation and scores of the strategies of English language learning ; Wiethead (2003) about the relationship between intrinsic motivation and achievement of students.

Students with intrinsic motivation determine goals for one and attempt toward reaching them. In fact, if they feel that they are under pressure to do interesting activities, it is likely that their motivation and internal interests would decrease. In contrast students with extrinsic motivation are likely to be determined by external factors, meaning that they are less self-determined . Their behavior is dictated by the external environment. So external factors and other individuals play a determinant role in their behavior and decisions (Bohrane, 2005).

A survey with 168 students who have had experiences being exposed to the three learning modes revealed that 72.9% still preferred a live course as it appears to attract students in respect of interaction, community, effectiveness, and enthusiasm. Those who preferred an online course (15.1%) attributed their reasons to convenience, time flexibility, privacy and self-paced learning.

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Interestingly, 12% expressed their preference towards a live online course. Although this is the smallest number, the results showed that, under this current circumstance, live online courses can serve as a promising solution as they are also perceived by the learners as a second most engaging, effective, enthusiastic, and interactive mode of learning. In contrast, online courses seem to be the least positive in all aspects, except convenience (Asawasuebsakul and Yasri, 2020).

Alexa, et al (2013) reported that this study identifies factors that increase and decrease student motivation in AS-L and explores ways to support students throughout the semester. At the beginning, middle, and end of the semester, participants completed surveys that elicited their reasons for their changes in motivation. Quantitative analyses revealed a decrease in motivation over the course of the semester and interaction between gender and student motivation. Males' motivation peaked at mid-semester, while females' motivation started at high levels and declined over the course of the semester. Qualitative analysis found that motivation increased when students enjoyed the AS-L experience, were interested in helping people, formed relationships with clients and community partners, and felt responsible to community partners. Motivation decreased due to lack of communication with community partners, lack of integration between the course and the AS-L experience, transportation issues, and difficulty with the time demands on student schedules.

Furthermore, Wangwongwiroj and Yasri (2021) reported that, this study compared students' perceived levels of n be influenced by mastery experiences, verbal persuasion, vicarious experiences, and physiological states. The analysis was based upon students who had no technical difficulties to access live online courses. However, this may not be applicable to contexts where internet connection is problematic. For educational implications, the findings revealed that live online courses are proven to be the most appropriate mode of learning during the pandemic. In contrast, online courses are associated with lower levels of mastery experiences, vicarious experiences, and verbal persuasion perceived by learners; whereas live courses lower psychological states. Generally, Motivation helps people to be successful & happy, as well as when people are motivated by happiness, they are likely to experience a fulfilling life. They will be motivated to continuously work for things that will make them happy. Motivation inspires people to progress and progression will help to make people happy, especially if they working toward things that make them happy, so motivation lead to happiness in life (Ramzan and Mahdinejad, 2013).

V. CONCLUSIONS

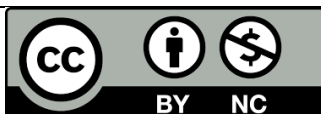
This study emphasizes investigating the statistical relationship between students' happiness and their own motivation during learning online compared to learning on-site. The responses from 253 students provide empirical evidence to support statistical links that there were strong positive correlations between happiness and motivation in both on-site and online learning, where the statistical scale in terms of happiness and motivation between learning on-site is significantly higher than learning online. Additionally, this study offers new evidence to point out a strong correlation between different learning environments and students' motivation and happiness. Furthermore, it provides status alerts correlating between happiness and motivation while learning. The results from this study can be used to improve online learning for students during the COVID-19 pandemic.

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Social Studies Teacher's Perception in the Use of Educational Websites in Online Teaching in the Philippines: A Systematic Literature Review



Mr. Jeanel C. Gregorio

ABSTRACT: The pandemic has challenged the educational system to alter the delivery of instruction from the traditional face-to-face into distant learning, modular and online. This sudden paradigm shift posited a lot of concerns particularly in the integration of technology in social studies curriculum. This review used the systematic literature review to analyze the empirical literature and the reading log (University of South Australia) to analyze the findings. The systematic literature is a rigorous approach in searching related literature, identifying publications to be included to undergo an iterative and transparent processes, analyze the data through a structured abstraction and a systematic approach (Gentles, S.J. et. al. 2016). This review found out that there is a limited literature in the integration of technology specific in social studies both internationally and in the Philippine context. Although there are some literature on technology integration in social studies, they failed to tackle the experiences and challenges by the teachers in technological integration in full online delivery of instruction specific in social studies teaching. Thus, it is recommended that researchers must explore other angles of technological integration in social studies such as the teacher's perceptions of specific technologies used in the subject. Second, the experiences and challenges they encountered during the delivery of instruction amidst the crisis. Third, studies should also be conducted on the effect of technology integration to student outcomes. These studies will serve as the basis for the future planning, design, implementation, assessment, and modification of social studies curriculum to be more student centered, contextualized and inclusive with the use or aid of technologies.

INTRODUCTION

The internet and newly developed technologies defined today's society. Even amidst the pandemic, education was pursued due to the alternatives offered by technology, most especially with the advent of using the internet. It bridges the gap between each other to communicate, socialize, run errands, do business, and attend school even at the comfort of our homes. In education, the e-learning tools and various online platforms have played a vital role in delivering education, helping basic and tertiary education institutions to facilitate student learning during the school closure (Subedi et al., 2020). Hence, the use of relevant pedagogy for online education was seen as an alternative but the effectiveness may vary on the expertise and exposure of teachers to information and communications technology (ICT). The use of educational websites has been the trend as the educational system engaged in a paradigm shift. Some of the online platforms used worldwide must be a unified communication and collaboration platforms such as G-Suite (Google Classroom, Google Meet, etc.), Zoom, Microsoft Teams, Canvas and Blackboard, which allow the teachers to create educational courses, training and skill development programs (Petrie, 2020).

In the Philippines, the crisis required an abrupt exodus from the traditional face-to-face interaction to virtual and modular learning, hence faces challenges among the Filipino teachers and learners in terms of access and engagement in these new modalities. The Department of Education (DepEd) released the Basic Education Learning Continuity Plan (BE-LCP) which serves as the blueprint to what and how education would be during the crisis, along with the Most Essential Learning Competencies (MELCs). These plans are anchored on the '*Sulong Edukalidad*' (Advancement of Quality Education) framework which modified the curriculum and became the basis of the Philippine education aligned in the present situation of the country. Further, UNESCO reiterated that learning quality, access, and system strengthening cannot be compromised in times of crisis (UNESCO, 2017), or else would have a negative effect on human capital. The Department of Education was committed to comply with UNESCO's call and sustain the delivery of quality, relevant, accessible and liberating Philippine education system even during the crisis as stated in one of the Sustainable Development Goals, quality education for all. These initiatives resulted in the adaptation of online and modular learning modalities.

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Thus, online learning became a new phenomenon among Filipino learners and teachers. Training and webinars were conducted in various institutions to look for other alternatives for educational continuity. There are 50,000 public schools shifted into home-based instruction and 24 million students are expected to receive teaching instructions online, in modular, in television and radio (Mendoza, 2020). While the public school adopted the modular and TV or radio based instructions, many private schools opted to adopt the online modalities. Hence, tenured teachers find ways to adapt to the changes, learning materials were modified to fit in the learning modality adapted by their respective institution – online, blended, or modular. The effects of online learning in the overall well-being of the teachers and students are among the considerations that needed to be discussed with.

This altered reality in the education system has affected the teachers, much more, in social studies whose end goal is to develop the civic engagements among the students. Technological knowledge in teaching social studies, affects teachers' perception on the appropriate educational technologies to be used in the classes (Crawford & Kirby, 2008). The lack of technological knowledge could lead to a tendency for social studies teachers to swing back in the traditional way of teaching. The teachers' use of technological applications in their lessons is associated with their skills and self-efficacy in using technology (Friedman and Heafner, 2010 as cited by Fidan, 2017).

This paper seeks to systematically analyze the existing literature using the systematic literature review in the use or integration of technologies and educational websites in online teaching of social studies in the Philippines. This paper shall serve as the basis of future research studies in curriculum development, planning, modification, and implementation in social studies.

METHODOLOGY

To determine the effectiveness and the use of educational websites in facilitating learning in social studies, this paper has been made to conduct a systematic methods overview. A term used to refer to reviewing the methods of literature from various sources – preferably, peer-reviewed journals. In this methodology, literature consulted for such reviews may include the methodology of the literature, methods-relevant sections of empirical research reports, or both (Gentles, 2016). It involves a rigorous and transparent approach in searching for the methods literature points at reviewing and selecting the influential publications. The insights presented in this paper were presented based on the findings of the systematic overview. The methods literature was firmly established, where the possible publication types include journal articles, books, and book chapters while the methods-relevant sections of empirical study reports, was poorly enforced due to the limited number of scholarly articles about technology integration in Social Studies in prominent Social Sciences and Humanities journals.

The systematic approach was used over an authoritative narrative approach to ensure that the review was accountable and thorough. Some studies were highlighted in terms of their methodology and goal to give light to other angles or areas that needed to be explored. The purposeful sampling was utilized in selecting publications in relation to integration of technologies and websites in social studies, the teacher's perception in utilizing these technologies, and their benefits for both teachers and students. The Reading Log introduced by University of South Australia was used to categorize the major points of each literature and is the basis for analysis and cross-examination of sources.

TECHNOLOGY ACQUISITION, USAGE, AND ROLE IN SOCIAL STUDIES

Various research studies were conducted prior to the pandemic to suggest the effectiveness of the integration of technology in Social Studies education to better effectively and efficiently facilitate learning in the 21st century. The study of Jančič, Polona (2018) on the teaching of social studies with the use of games, found that game-based learning enables an optimal learning environment for students and role-playing approach was cited as the most commonly used. However, results show that teachers rarely use game-based learning in teaching social science. Thus, it recommended the national curriculum to include experiential learning with games in teaching social studies (Jančič, 2018). This study focuses on the application of games in the face-to-face setting.

While Jančič (2018) focuses on the integration of game-based approach in social studies, Çetin (2010) as cited by (Fidan, 2017) supported this claim through the participants' claim that they become happier when a high number of elements such as activity, experiment, game and animation are integrated in the content of the curriculum through web-supporting teaching activities. A high number of processing questions during the web-based activities and games could provide reinforcement.

The integration of technology in teaching social studies allowed the teachers to escape from the traditional classroom approaches and explore more frontiers to facilitate learning effectively. Heafner (2013) provided insights about the teacher's perception of secondary social studies teachers. These include: a) provide opportunities for students to extend their learning in their homes, b) the development of student's cognitive skills for independent learning, c) address the student's learning

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deficiencies, d) allows the teacher to explore other platforms to present the instructional material to cater learner's varied learning styles (Heafner, 2013).

The literature in the Philippines revolves around the use of the Technological Pedagogical Content Knowledge (TPACK) framework in integrating appropriate technologies in teaching and the Will-Skill-Tool (WST) framework in both Science and Mathematics (Mercado, J. N., et. al, 2019 & Sasota, 2021). Both studies asserted the effective use of technology in both Science and Mathematics and suggested for teacher's training for the improvement of technological pedagogical knowledge. These studies are however limited in Science and Mathematics only.

The common denominator derived from these literatures is the ability to encourage the readers on integrating technology in the Social Studies curriculum. Based on the results, interactive educational websites should be commonly used by social studies teachers (Fidan, 2017). Thus, authors accept the reality that online instruction is a permanent fixture in education (Tschida, 2013). All teachers should be oriented and encouraged to use these websites (Çiftçi & Alemdar 2013). While these literatures focus on the integration of social studies in online teaching, the methodology was conducted in face-to-face interaction. For instance, the study of Heafner (2013) about the teacher's perception in technology integration was conducted in the face-to-face setting, not in a pure online environment. In the Philippines, there is no accessible research study pertaining to online teaching specific to social studies. This could lead to a presumption that this area needs to be explored. Both international and local literature could not provide answers as to what extent is the use of technology in social studies nor assess the experiences of learners and teachers in full online teaching in the subject during the crisis (Vanfossen, 2001).

PERCEPTIONS ON THE INTEGRATION OF WEBSITES IN SOCIAL STUDIES

A website consists of a group of pages that can be accessed using the internet. It provides an interactive interface among the users. In this context, the website refers to the educational tool used to facilitate learning, provide teaching-learning interaction, assess student's outputs, and deliver teaching instructions. Hence, in the academic literature, websites can be used as a source of information, as a tool for assessment, and as a platform to produce and share a product. (Dinç, 2017).

Based on the studies of Fidan (2017) and Tschida (2013) on the teacher's perception on the integration of educational websites in teaching social studies, they come up with useful websites. Some of these are Morpa Kampüs and Okulistik, Vitamin and partially, EBA, Blackboard, Camtasia, VoiceThread, and Prezi. These websites are found to be useful in delivering the content and student's assessment. They highlighted that they include various technologies to make the lessons more engaging with the content and teaching strategies (e.g., theoretical and content background readings, activities, discussion boards, videos). These websites enable the learners to enjoy the class and access information whenever or wherever they are. These help them also to learn by experience (Fidan, 2017). On the other hand, these websites are available more than three years ago and the technologies have quite developed in a short span of time. Now, the famous video conferencing used in online class and online engagement is Zoom, as of 2021. Other institutions adapted their own Learning Management System (LMS) while some adapted the G-Suite that includes Google Classroom, Google Meet (video conference), Google Slide (presentations), Google Docs etc. (Kormos, et. al. 2016) asserted that the document creation applications or websites were perceived as effective and commonly used internet-based technology. Some examples of these are the Google Docs or Microsoft 365. These educational websites have defined online teaching in times of crisis.

Social Studies teachers are the enforcers of educational websites. The outcome of the integration of technology in the field, satisfactory or not, could affect the teachers' pedagogy, much more than their well-being. Fidan (2017), Çiftçi & Alemdar (2013), and Heafner (2013) gathered teachers' perception on the use of educational websites in teaching social studies. All agreed that the aforementioned technologies could enable teachers to be better prepared and well-equipped, make classes become more entertaining, and help the teachers become efficient and convenient in delivering the instruction as students easily access the intended and the large amount of information used in the lesson (Fidan, 2017). Moreover, technology use promotes independent learning and students' cognitive skills. (Heafner, 2013).

Since 2012 up to 2017, the research studies on student's perception in integrating educational websites in the curriculum bears positive results. The use of documentary films and videos about historical subjects, events, and natural disasters was found to be effective. Based on the study of Adeyemi (2012) and Fidan (2017), technology integration significantly improved the student's motivation in Social Studies, and thus, enhanced their academic performance. Students expressed that the text-based discussions and projects done online were perceived positively and that the visuality precipitated positive changes in their attitudes toward social studies. Online learning promoted the positive attitude of the students in social studies. (Tschida, 2013; Çiftçi, 2013; Heafner, 2013).

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Based on the findings of the literature, there was a positive view on integrating websites and technology in delivering the instruction. It was recommended that the teachers are highly encouraged to include inactive education websites in delivering their content. Study participants reported that the use of interactive education websites in social studies classes offers many benefits to teachers and students. Further, the studies revealed personal trial and error as the most likely way to acquire new technological knowledge to prepare the learning materials (Fidan, 2017).

THE CHALLENGES OF TECHNOLOGY INTEGRATION IN SOCIAL STUDIES

Prior to the pandemic, institutions opted to integrate technology in their classroom faces challenges and problems. Though teachers who share their ideas on technology integration in the field have high levels of motivation (Johnson et al., 2015 as cited by Kormos, 2016), Vanfossen as cited by Heafner (2013) asserted that the major barrier in integrating technology in social studies curriculum is the lack of teacher training. Based on his findings, half of the respondents indicated they rarely integrate technologies and websites in teaching social studies. Further, Heafner's (2013) study revealed that internet outage or disconnection was found to be the barrier in delivering the instruction which consumes time while trying to implement the curriculum (Heafner, 2013).

To understand the current practices by teachers who are integrating technologies in the field, prepares future social studies educators. The need for training among the teachers could provide the success in administering technology in the classroom (Heafner, 2013). Secondary social studies teachers must develop a well-educated citizenry who are empowered with both cognitive and technological skills to become informed decision makers and productive and competitive workers (Heafner, 2013). Hence, the training programs should be carried out to a more effective curriculum in social studies (Kormos, et. al. 2016). Training programs and webinars must address the websites useful in delivering the instruction such as Google Docs, Slides, Meet, and Classroom to offer a variety of formats to demonstrate understanding and knowledge in a medium of the student's choice. Further, they may seek collaboration with other subject areas so as to provide curricular alignment in the integration of these technologies

The integration of technology was recommended to go beyond the four corners of the classroom. The student's learning is challenged and prepares them to be active agents in national policy and civic engagements. Further, it enhances learning outside from the readily available materials in the school and alters the nature of learning into a more student and independent learning. Hence, Kormos, et. al. 2016 recommended that the government must engage in studies that promote appropriate use of technology in the learning settings.

Technology is used in the classroom as a referencing, a communication, and a collaboration platform. However, not all teachers are digital-natives. These teachers have undergone rigorous training and review to adapt the changes in delivering the instructions. Teachers who experience difficulty in meeting the demands of the digital world creates a digital competency gap between the students. The digital inequality in schools based on the students' capacity to use technology for academic purposes has been found to be associated with teachers' technological capacity and interventions. (Nueva, 2019)

In the Philippines, the study of Abante, et. al. (2021) is the most recent on the Comparative Analysis on the Challenges of Online Learning Modality and Modular Learning Modality. The challenging part is the lack of training among the teachers in delivery of online teaching and assessment. The study is limited only to the overall challenges of the teachers in private and public school but does not focus on the use of technology in online class. In higher education institution, among the issues and challenges are: the ability to clearly deliver the topic, lack of study of working area and time in doing online activities, poor internet connection among the teachers and students, and the ability of the instructors/professors to cater the needs of the students (Fabito, 2020). Hence, there is a greater need for the educational institutions to proliferate studies on the impact of the pandemic to the educational system. Strengthening the practices in the curriculum for it to be more responsive to the students beyond the four corners of the classroom was among the recommendations (Toquero, 2020). Abante, et. al. (2021); Fabito, 2020; Toquero, 2020 focus primarily on the experiences of both teachers and students in coping up the online class amidst the pandemic. However, there are no available literature specifying the experiences of social studies educators in the use of technology in online teaching.

CONCLUSION

The aforementioned studies were the result of the rigorous effort of various institutions to contribute knowledge in the field of social studies. Prior to the pandemic, there were various studies conducted primarily in Turkey and other countries in West Asia. However, due to language barriers, the researcher finds difficulty in transcribing the texts. Hence, the study of Heafner (2013) and Fidan (2017) were the major basis. While Heafner (2013) has focused on the perceived technology integration, Fidan (2017) looked into the teacher's perception on the use of educational websites in social studies teaching. Further, Kormos (2016) examined the use of preservice social studies educators in technology integration.

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Empirically, there is a limited literature in the integration of technology in social studies particularly in the Philippine context. Therefore, this review may serve as the guide or the basis for future studies in the social studies online teaching. It is highly recommended that researchers must explore the areas of social studies in terms of perceptions of specific technologies used, teacher and student experiences in integrating websites and technologies, and the challenges encountered by the social studies teacher in times of pandemic. Studies on the effect of technology integration in delivering the instruction to student outcomes are also recommended. These studies will serve as the basis for the future planning, design, implementation, assessment, and modification of social studies curriculum to be more student centered, contextualized and inclusive with the aid of technologies.

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New Anthropometric Indicators are associated with Glycemic Control in Type II Diabetics with Excess Weight



Larissa Albuquerque¹, Liana Andrade Oliveira²

ABSTRACT

Objective: To evaluate the association of new anthropometric indicators with glycemic control in overweight patients with type II diabetes.

Methods: The sample consisted of 164 type II diabetic patients selected for convenience. Demographic, socioeconomic variables and time since diabetes diagnosis were collected using a structured questionnaire. Anthropometric measurements of weight, height, waist circumference (WC) and hip circumference were taken. The Body Mass Index (BMI), BodyShape Index (ABSI), BodyShapeRoundness Index (BRI) and Body Adipose Index (BAI) indicators were calculated. The 12-hour fasting blood samples were collected by means of digital puncture by a trained professional. Patients were classified into two groups: controlled (≤ 130 mg/dL) and altered (> 130 mg/dL) glycemia. To evaluate models adjusted for glycemic control (dependent variable) and new indicators (independent variables), logistic regression was used.

Results: There was a correlation of the new anthropometric indicators with the body mass index. It was observed that there were no differences in the means of BMI, WC and the new indicators (ABSI, BRI, IAC) between glycemic control status. The new anthropometric indicators were not associated with glycemic control in type II diabetics, only ABSI in women was associated with altered glycemia (OR=3.81; $p=0.040$). **Conclusion:** We conclude that the ABSI anthropometric method in women is associated with glycemic control in patients with type 2 diabetes mellitus.

KEYWORDS: Diabetes; Overweight; Anthropometry

INTRODUCTION

Diabetes mellitus (DM) is a metabolic disease, caused by the body's resistance to insulin and/or no production of insulin by the body. Type 2 diabetes mellitus represents about 95% of the diagnosed cases of diabetes mellitus. The diabetic is characterized by chronic hyperglycemia, disturbances in the metabolism of carbohydrates, fats, proteins, originating from a defective secretion and/or action of insulin in the tissues – target(1).

The treatment of diabetes is predominantly with glycemic control. For adequate verification of diabetes, regardless of type, extensive self-care is required, with efficient glycemic control, as high glycemic levels are related to serious microangiopathic (diabetic retinopathy, diabetic nephropathy and distal sensory neuropathy) and macroangiopathic (ischemic heart disease) complications. , peripheral vascular disease, stroke). It is believed that the control of overweight and obesity is a determining factor for effective glycemic control, however it is estimated that 90% of patients with type 2 diabetes mellitus (DM2) are overweight, thus presenting possible negative consequences in their complex treatment(2.3).

Thus, an effective tracking of changes in body composition, common in overweight, can help to reduce the consequences and complications of diabetes mellitus. Anthropometry thus stands out as a non-invasive, low-cost method and is the most used to assess body composition. In recent decades, new indicators and formulas have been proposed to more accurately estimate body adiposity. Bearing in mind that the classic use of the body mass index (BMI) did not guarantee reliable results from this perspective(4,5).

The body mass index (BMI) was ordinarily used by health professionals in the assessment of dietary status and mortality risk. However, this index does not provide information on the distribution and proportion of body fat(5).

New anthropometric indicators have emerged in recent years(4), three of which stand out here: BodyShape Index (ABSI)(6,7), BodyShapeRoundness Index (BRI)(8) and Body Adipose Index (BAI)(9). The BodyShape Index (ABSI) is based on waist circumference adjusted by height and BMI(6,7). The BodyShapeRoundness Index (BRI) is a body shape indicator capable of predicting total and

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visceral body fat(8).The Body Adipose Index (BAI) can be used to check the percentage of body fat in men and women of different ethnicities(8).

Given these new anthropometric indicators and the need for more careful tracking and monitoring of body adiposity for effective treatment of diabetes, the objective of the present study was to evaluate the association of new anthropometric indicators with glycemic control in patients with DM2.

MATERIAL AND METHODS

Outline

This is a cross-sectional study that used baseline data from a double-blind, placebo-controlled clinical trial that evaluated the effect of tamarind flour consumption in patients with type II diabetes conducted between 2016 and 2017.

This research was submitted to and approved by the Research Ethics Committee of the University of Fortaleza, with CAAE 30308114.1.0000.5534 and was registered in the Brazilian Platform for Clinical Trials (RBR-4xzjny). All participants signed an informed consent form. The study was funded by the National Council for Scientific and Technological Development (CNPq), through the Call MCTI/CNPq/MS - SCTIE - Decit No. 07/2013

Location and Population

The research was carried out at the Integrated Center for Diabetes and Hypertension of Ceará, a reference institution in the treatment of diabetes. The study population consisted of diabetic patients treated at the aforementioned institution. The sample consisted of 164 type II diabetic patients selected for convenience.

Inclusion criteria for the study were: presence of type 2 diabetes mellitus diagnosed for at least 2 years; be over 20 years of age; being overweight or grade I obesity according to the body mass index (BMI)(10,11); be using oral hypoglycemic agents (metformin hydrochloride, glibenclabin and/or glicazide). As exclusion criteria, use insulin; having another known chronic illness; the presence of pregnancy.

Data collect

Demographic, socioeconomic variables and time since diabetes diagnosis were collected using a structured questionnaire.

Anthropometry

Anthropometric measurements of weight, height, waist circumference (WC) and hip circumference (HC) were taken. Weight and height data were obtained on a properly calibrated digital anthropometric scale, Balmak, with a capacity of 150 kg with a variation of 50 g, measuring up to 2.00 meters with a graduation of 0.5 cm. Waist and hip circumferences were measured according to WHO recommendations(12) using an inelastic measuring tape.

The following anthropometric indicators were calculated:

Body mass index (BMI)

$$\text{BMI} = (\text{Body weight (kg)}) / (\text{Height (m)}^2)$$

ABSI (Total)

$$\text{ABSI} = (\text{CC (m)}) / ([\text{BMI (kg/m}^2\text{)}]^{2/3} \times [\text{Height (m)}]^{1/2})$$

ABSI (Men)

$$\text{ABSI} = (\text{CC (m)}) / ([\text{BMI (kg/m}^2\text{)}]^{2/3} \times [\text{Height (m)}]^{1/2})$$

ABSI (Women)

$$\text{ABSI} = (\text{CC (m)}) / ([\text{BMI (kg/m}^2\text{)}]^{3/5} \times [\text{Height (m)}]^{1/5})$$

BRI

$$\epsilon = \sqrt{1 - ((\text{CC (m)} / 2\pi)^2 / ((0.5 \times \text{Height (m)})^2))}$$

$$\text{BRI} = 364.2 - (365.5 \times \epsilon)$$

IAC

$$\text{IAC} = (\text{CQ(cm)}) / (\text{Height (m)} \times \sqrt{\text{Height (m)}}) - 18$$

fasting blood glucose

To measure fasting blood glucose (mg/dL) for 12 hours, the Cholestech LDX device (Alere company) was used. Blood samples were collected by means of a digital puncture by a trained professional.

Patients were classified into two groups: controlled glycemia (≤ 130 mg/dL) and altered (> 130 mg/dL) as recommended by the Brazilian Society of Diabetes - SBD(2) and American Diabetes Association - ADA(13).

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Data analysis

Demographic, socioeconomic variables and time of diagnosis were compared according to glycemic control using the chi-square test. The new anthropometric indicators (ABSI, BRI and IAC) were correlated with BMI using Pearson's correlation. Means of anthropometric indicators were also compared with glycemic status using Student's t test. Finally, to evaluate models adjusted for glycemic control (dependent variable) and new indicators (independent variables), logistic regression was used. $p < 0.05$ was considered significant.

RESULTS

In the analyzed patients, there was an equal proportion of men and women, most were aged 60 years or older (57.9%, $n=95$), 88.4% ($n=145$) were non-white and 51.2 % ($n=84$) had more than 12 years of schooling. 78.7% ($n=129$) reported receiving more than 1 minimum wage and 58.5% ($n=96$) had more than 10 years of diagnosis of type II diabetes. After stratification by glycemic control, it was observed that there was no difference between the groups in the analyzed demographic, socioeconomic and time of diagnosis variables (Table 1).

There was a correlation between the new anthropometric indicators and the body mass index (Figure 1). BMI showed a positive correlation with WC ($r=0.660$; $p<0.001$). BRI showed a moderate positive correlation with BMI ($r=0.713$; $p<0.001$). With the percentage of fat, estimated by the IAC, there was a moderate positive correlation with BMI ($r=0.513$; $0<0.001$). ABSI (Men, Women, Total) was not correlated with BMI ($p>0.05$).

In Table 2, it was observed that there were no differences in the means of BMI, WC and the new indicators (ABSI, BRI, IAC) between glycemic control status. The means of anthropometric variables were 29.3 (2.32) kg/m^2 for BMI, 101.4 (6.76) cm for WC, 0.084 (0.004) for ABSI (Men), 0.121 (0.005) for ABSI (Women), 0.085 (0.004) for ABSI (Total), 6.47 (1.24) for BRI and 34.26 (5.71) % for IAC.

The new anthropometric indicators were not associated with glycemic control in type II diabetics (Table 3). With the exception of ABSI (Women), in which women with the highest tertile of ABSI were more likely to have altered blood glucose, after adjustment for time of diagnosis, self-reported race, age and BMI ($OR=3.81$; $p=0.040$).

DISCUSSION

This study aimed to evaluate the association of new anthropometric indicators with glycemic control in patients with DM2. It was observed that only ABSI in women was associated with glycemic control regardless of time of diagnosis, self-reported race, age and BMI.

The study of the new indicators used here is still incipient and scarce, and there is no consensus on their superiority over traditional indicators. In Brazil, Rezende(3) observed that the new indicators (ABSI, BRI and IAC) were not superior to traditional anthropometric indices (BMI and WC) to discriminate diabetes. In another study, it was observed that ABSI and BRI were also not more efficient in identifying diabetes compared to BMI and WC. However, BRI had a better performance in identifying obesity and a higher correlation with diabetes compared to ABSI(14).

The BRI has been considered effective as a predictor of body fat(15), so it could be used to assess health conditions and diagnose chronic diseases, such as type 2 diabetes mellitus. However, in the present study, the BRI was not associated with control glucose in diabetics.

In a similar study, the ABSI showed low discriminant power in the identification of chronic diseases(16). Here, ABSI in women was the only indicator that was associated with glycemic control, in which women with the highest ABSI were more likely to have altered blood glucose, after adjustment for confounding factors ($OR=3.81$; $p=0.040$).

In a study, IAC was evaluated to estimate the percentage of body fat and the incidence of type 2 diabetes mellitus. It was observed that IAC did not show a good response in the quantification of body fat, compared to waist circumference in men and hip circumference in women, and it was also not considered a good predictor for diabetes(17).

Corroborating this, another study that used the IAC to estimate body fat in athletes with type 2 diabetes mellitus, it was observed that the IAC presented limited performance for the prediction of fat percentage in elite athletes with diabetes, especially when compared to other methods such as bioimpedance analysis or skinfold prediction models, thus showing that it was also not a good predictor for the identification of diabetes(18).

Although interesting, our findings have some limitations, such as: the complexity of formulas that make it difficult to calculate quickly and immediately, thus making it a time-consuming and ineffective method for faster care in outpatient clinics. Another limitation was the fact that the volunteers used drugs for the treatment of diabetes, as well as other types of drugs, which may influence our findings, often masking the measurement of fat mass and lean body mass influenced by water retention.

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CONCLUSION

We conclude that the ABSI anthropometric method in women is associated with glycemic control in patients with type 2 diabetes mellitus. Indicators such as BRI and IAC were not associated with glycemic control. The use of these indicators in clinical practice still requires investment in technologies to facilitate their immediate calculation.

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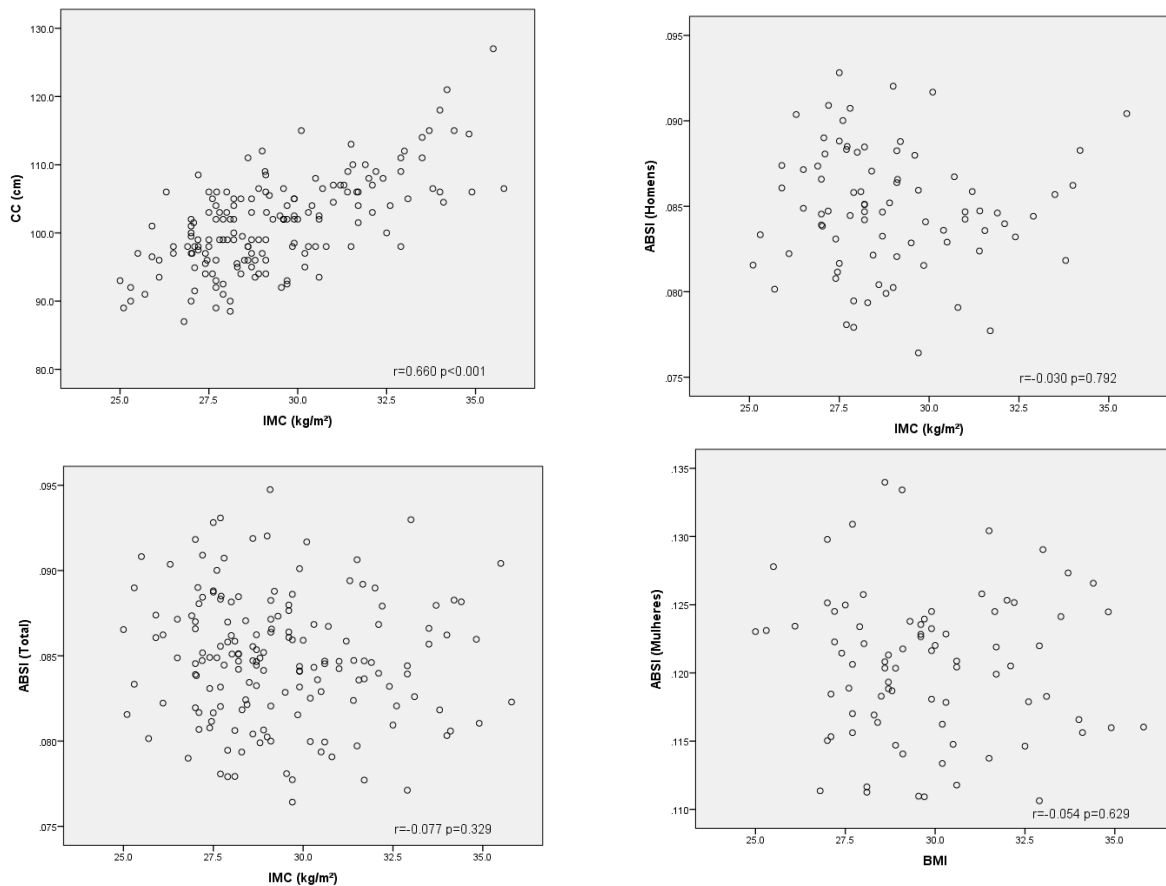
TABLES

Table 1. Comparison of demographic, socioeconomic variables and time of diagnosis between glycemic control.

Variables	Fasting glucose (mg/dL)		Total (n=164)	p*
	Controlled blood glucose ≤ 130 (n=77)	Altered blood glucose > 130 (n=87)		
Gender				0,639
Male	37 (48,1%)	45 (51,7%)	82 (50,0%)	
Female	40 (51,9%)	42 (48,3%)	82 (50,0%)	
Age group				0,087
< 60 anos	27 (35,1)	42 (48,3)	69 (42,1)	
≥ 60 anos	50 (64,9)	45 (51,7)	95 (57,9)	
Self-declared race				0,348
No- white	70 (90,9%)	75 (86,2%)	145 (88,4)	
White	7 (9,1%)	12 (13,8%)	21 (11,6)	
Education				0,861
< 12 anos	37 (48,1%)	43 (49,4%)	80 (48,8)	
≥ 12 anos	40 (51,9%)	44 (50,6%)	84 (51,2)	
Family income				0,829
≤ 1 SM	17 (22,1%)	18 (20,7%)	35 (21,3)	
> 1 SM	60 (77,9%)	69 (79,3%)	129 (78,7)	
Diagnosis time				0,353
≤ 10 anos	29 (37,7%)	39 (44,8%)	68 (41,5)	
> 10 anos	48 (62,3%)	48 (55,2%)	96 (58,5)	

*Chi-square test. Values expressed in n(%).

Figure 1. Correlation of WC, ABSI (Men, Women, Total), BRI, IAC with IMC.



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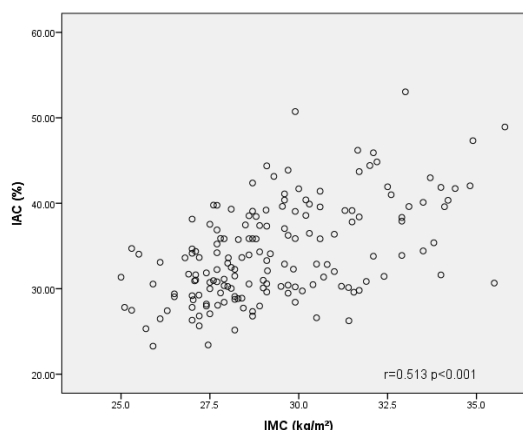
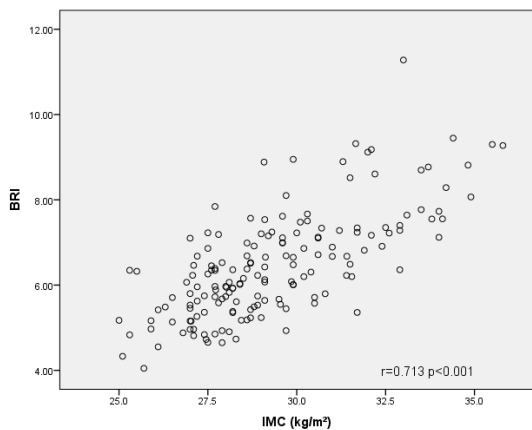


Table 2. Comparison of anthropometric variables between glycemic control.

Anthropometric variables	Fasting blood glucose (mg/dL)			p*
	Glicemia controlada ≤ 130	Glicemia alterada > 130	Total	
IMC, (kg/m²)	29,58 (2,35)	29,13 (2,32)	29,3 (2,34)	0,214
CC, (cm)	101,41 (6,72)	101,31 (6,83)	101,41 (6,76)	0,922
ABSI (Men)	0,085 (0,004)	0,084 (0,003)	0,084 (0,004)	0,593
ABSI (Woman)	0,120 (0,005)	0,121 (0,005)	0,121 (0,005)	0,187
ABSI (Total)	0,085 (0,004)	0,085 (0,003)	0,085 (0,004)	0,668
BRI	6,57 (1,27)	6,37 (1,21)	6,47 (1,24)	0,295
IAC, %	35,11 (6,28)	33,51 (5,08)	34,26 (5,71)	0,075

*Student's t test. Values expressed as mean and standard deviation.

Table 3. Chance of altered blood glucose between tertiles of anthropometric variables.

Variáveis antropométricas	Oddsratio	p*
ABSI (Men)[#]		
1° tercil	Reference	
2° tercil	2,31	0,208
3° tercil	2,63	0,182
ABSI (Woman)[#]		
1° tercil	Reference	
2° tercil	1,60	0,438
3° tercil	3,81	0,040
ABSI (Total)		
1° tercil	Reference	
2° tercil	1,99	0,105
3° tercil	1,97	0,134
BRI		
1° tercil	Reference	
2° tercil	1,02	0,961
3° tercil	1,60	0,399
IAC, %		
1° tercil	Reference	
2° tercil	0,92	0,854
3° tercil	0,58	0,436

Model adjusted for time of diagnosis, self-reported race, age and body mass index. *Model adjusted for time of diagnosis, self-reported race, age, body mass index, and sex.

Government Policies and the Growth of Small and Medium Enterprises (SMEs) in Anambra State



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ABSTRACT: The study examines the effect of government policy on the growth of small and medium enterprises (SMEs) in Anambra State. The study was anchored on the business growth theory. Descriptive survey design was adopted. The Population was 1,200 SME operators in Anambra State. The sample size of 300 SMEs was employed using Yamane's formula. Questionnaire was the major instrument of data collection used in the study. Regression was used to analyse the formulated hypotheses in the study. The study discover that government credit policy granted, government tax policy and government licensing policy has a significant positive effect on the growth of small and medium enterprises in Onitsha North Local Government area, Anambra State. The study concludes that government policy has a positive significant effect on the growth of Small and Medium Scale Enterprises. The study recommends among others that government should reassess its various policies put in place to alleviate negative effect on credit policy on the growth of SMEs in Anambra State, Nigeria. Government should develop a system for tax payment so as to enhance efficiency in tax collection and payment.

KEYWORDS: Credit Policy, Tax Policy, Licensing Policy, and Growth of SMEs.

INTRODUCTION

In all economies, both industrial and emergent nations, and fast growing economy, there is a agreement among the law makers, administrator's researchers, supporter and non-governmental organizations, that SMEs are the powerful force for industrial growth, economic and sustainable growth. SMEs are regarded as the strength of economic enlargement and reasonable growth in emergent economies. They are labour demanding, capital saving and able to create more than one billion new jobs the humanity need by the end of the century. They are also apparent to economy growth, poverty alleviation and job creation (Agwu & Emeti, 2014). World Bank and European Union (EU) (2010) ascertains that SMEs-sized enterprises comprise 99% of an estimated 19.3 million enterprises provide about 65 million jobs representing two-thirds of all employment. SMEs in Africa make up the larger percentage of businesses and employ a large portion of the population. Governments institute many rules and system that direct businesses. Businesses would usually adapt their operations to changes in government, rules and regulations. The competitiveness and profitability SMEs are influence by. SMEs owners and they must obey the regulations established by federal, state and local governments. The government makes policies that change the social behavior in the business world. Government can guarantee the increase of new knowledge that will bring the essential change, imposing on a particular sector more taxes duties and lose interest in that sector. Likewise, tax and duty exclusion on a particular sector activate investment and may crate growth. A high tax rate on export goods, encourage local production of the same goods and high tax rate for raw materials would hinder domestic production. Government policies affect the development of SMEs have been examined in many study. Government policies assisted many companies by exempt them from taxes on imported (Cadbury World, 2014). This decrease production costs, and the formerly and products became inexpensive for the wider population. Growth is constrained by internal factors and external factors, of the surroundings by government policy or competition. SMEs have the capability to produce enough skilled and semi-skilled workers (Bubou, et al 2014). The competitive advantage assets SMEs in area resources management that is superior to those of its competitors. Nigeria has a lot of SMEs which provider job opportunities for the legal population. Nigeria SMEs lacked government sustain policies that restricted their access to improving their performance. Studies connected to increase of SMEs do not offer all comprehensive look for the performance of these firms (Harvie, Narjoko, & Oum, 2010). Micheal and Jones (2013) acknowledged that government rules as one of the major sources of policy formulation to develop the enlargement of SMEs.

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Policies may create answer to problem SMEs operation with reverence to various interest groups associated with the firm sometimes referred to as applicant on the operation.

Micheal and Jones (2013) posited that government at various levels establish, anti-trust and labour laws, product labeling requirements, taxation and various other kinds of government regulations and control. Ibekwe (2014) viewed the significance of policy making at government level and the objectives of policies of a country increase output, reduction of inflation, reduction of employment, diminution of economy inequality and trade balance creation. To ensure possibility and execution of set objectives, government makes sure policies. Based on the background, the study scrutinizes the effect of government policy on the growth of SMEs in Anambra State.

STATEMENT OF THE PROBLEM

SMEs in Nigeria have not achieved it objectives projected, but have to vital position in the expansion of the economy of the nation. This role has been of interest to many, like the government, practitioners, citizenry and some private sector. Yearly, the three tiers of government, federal, state and local government, through budgetary allotment and policies have shown interest and acknowledgment of the vital functions of the SME sector of the economy and thereby made advance for vitalizing the same. There have also been funding, mutual and joint agencies support and aids, fiscal incentives, as well as dedicated institutions, all geared towards improving the growth of SME in Nigeria. Despite the potentials, SMEs in Nigeria is faced with numerous problems ranging from poor sources of finance, poor infrastructural facilities such as power supply, good road, water supply among others, in the setting were the business was recognized, and unproductive and bad government policies, which is the focused of this study. Oluwadare and Oni (2016) discover two forced that affect SMEs there are internal factors such as entrepreneur competencies, commitment, resource, strategic choice and, external factors like competitors, culture, technology, and infrastructure and government policy. Aremu and Adeyemi (2010) revealed that the most of the SMEs in Nigeria die within first 5 years of survival because of scant funds, lack of focal point, insufficient research, over attentiveness on one or marketplace for completed product, lack of succession arrange, ignorance, lack of recording, lack of power offer, infrastructural inadequacies (water, roads), failure to detach business and family finance, lack of commerce strategy, inability to identify income and profit, incapability to get the correct plant and machinery, inability to interact or use the correct calibre of employees and cut-throat competition (Motilewa et al, 2015). From the above reason, this study seeks to investigate government laws on the growth of SMEs (in Anambra State.

OBJECTIVE OF THE STUDY

The main objective of this study is to investigate the effect of government policy on the growth of SMEs in Anambra State. The specific aim of the study include to:

Examine the effect of government credit laws on the growth of small and medium enterprises in Anambra State

Determine the effect of government tax laws on the growth of small and medium enterprises in Anambra State

Assess the effect of government licensing regulation on the growth of small and medium enterprises in Anambra State

Hypotheses

Ho1: Government credit policy granted has no significant positive effect on the growth of SMEs in Anambra State

Ho2: Government tax policy has no significant positive effect on the SMEs in Anambra State

Ho3: Government licensing policy has no significant positive effect on the growth of SMEs, Anambra State

REVIEW OF RELATED LITERATURE

Conceptual Framework

Government policies Government policy is attach to all that affect SMEs positively or negatively. Tende (2014) ascertain that government laws are intended to restrain the connection between the SMEs and the economic growth of a nation through wealth creation and job creation. Government rules support agencies are institutions that aim at adaptable and improving the situation of SME's in terms of supportive, execution and funding policies by the government (Bouazza, Ardjouman & Abada 2015). Based on this definition, government sustain agencies as it relate to SMEs businesses is targeted at encouraging by making a favorable environmental law for the SMEs by making a favorable surroundings for the entrepreneurs. This, it does through enactment of guidelines that will regulate policies that will help and that reduce the problems of SMEs which is the bedrock of nation's path to industrialization. Government needs to endorse rules that would be user friendly to the SMEs (Ahiawodzi, & Adade 2014).

Pissarides (2011) argues government rules as they relate to SMEs to be fruitfully put into practice in the area of economy development government in power need to put in place rule and principle that governs the growth of SMEs in Nigeria. In the case

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of government rules, it is believed that government is the front runner that will lead to the development of SMEs, and provide much needed resources within their ability. Such resources include provision of conducive environment to SMEs business that will promote SMEs growth. A policy can be defined as a plan of action agreed and chosen by a group of people, organization, or political party. In business, strategy can be group as inner or outside. The interior rule direct and bring out how business activities are run. The interior rules, also known as business strategy, are set by the owners and management of a business, and decide their scope of business (Oviatt & McDougall, 2005). But these business rules are needy and often prejudiced by the overall government regulation within the economy in which SMEs operate. The government policies therefore, are external regulations which are not within the direct control of the SMEs within the economy.

Government Credit Policy

Government credit policies is a strategy supported long-term growth aims of SMEs business alternatives by the government to control loans and credit policies. In difference, bond markets are much more responsive to short-term macroeconomic and company trends (so-called capital market short-termism). In such cases, a legal tender crisis or bond evasion by a ruler state issuer can cause a big loss of self-assurance and, as a consequence, the unfeasibility to finance projects with bond issues. Government has identified the need for the improvement of SMEs. One of such strategies is the preamble and search of rules such as concessionary financing to support and fortify the growth of SMEs in Nigeria.

Government Tax Policy

Taxation is a process through which governments all over the globe raise revenue to finance her expenditures by forcing charges on their corporate entities, citizens as well as on commodities and services. The tax plays significant responsibility to the growth of SMEs. Therefore, arrangement of the tax system to the situation specific SMEs growth needs to be considered an significant agenda for the law makers (Poutziouris et al., 2009). For the rationale of defend and manage the operation of SMEs in government imposes numerous types of taxes with the aim of protecting infant industries and guarantee fair competition among SMEs. High tax rates and tax responsibility dishearten the growth of SMEs (Oludele & Emilie, 2012). From economic point of view, taxes increase production cost of goods and services which would eventually leads to higher price of goods/services to the final consumers.

Bowen et al. (2009) indicated that taxes are apparent the major problem for both young and old firms. A conducive tax surroundings allow SMEs to meet possible tax obligations was however suggested. Government Licensing Policy Government licensing poses serious problems to SMEs development and through comprehensive structural improvement for growth of SMEs. High cost licensing registration high cost affect the growth SMEs operations (Wanjohi & Mugure, 2008). Tolentino (2005) argue that lawful and authoritarian structure which results into excessively complex registration and licensing requirements and demands tedious and costly reporting practices is likely to inflict constraints on the business activities. Nkya (2012) sees business licensing procedure as another area most entrepreneurs consider to be bureaucratic. SMEs exposed that no specific explanation that may be taken as a reference by economies, statistical agencies or researchers.

Regardless of the lack of universality of the definition and the lack of arrangement in the criteria, the significance of SMEs description is unchallengeable. The definition of SMEs is vital and useful: in the grounding of statistics and the watching of the sector over time; in benchmarking against other economies and between regions within an economy; in providing random thresholds for obligation of tax or other system; in influential eligibility for exacting public support (Berisha & Pula, 2015). Safiriyu and Njogo (2012), opines that, there is no worldwide definition of SMEs. Definitions also modify overtimes, owing to changes in price level, move forward in technology and other thought. Principles that may be used in the definition of small scale enterprises often comprise turnover, gross output and service. These factors are typically used because they are useful and easy to measure.

THEORETICAL FRAMEWORK

This study is anchored on the business growth theory. The theory of business growth was proposed by Penrose. The theory presented some powerful ideology guiding the growth of firms and the speed at which firms can productively grow to bigger firms. Penrose declare that firms are a package of internal and external resources that help a firm to grow and to achieve a competitive advantage. She further gives details that firm size is negligible to the growth process, whereas firm growth is resolute by the successful and innovative managerial resources within the firm. She added that the accessibility of top managerial and technical ability serves as an engine to a firm's growth. Penrose recommended that unawareness of these factors consequences in failure and loss of competitive advantage. The theory of business growth entails that the speed of growth of a firm is autonomous of its original size. By insinuation it means that big firms are preferable in situation of private sector growth given that they generate more employment than small firms. However, small firms improve their performance as they accumulate market knowledge over time. This also entails that small firm start and develops, through some increase phases. The phases of expansion are

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acknowledged as; continuation, survival, success, take off and resource development. In each stage of growth as different set of factors is serious to the firm's survival and success.

EMPIRICAL REVIEW

Ameh, Alao and Amiya (2020) studied the impact of SMEs enterprises on Nigeria economy growth. The research shows that SMES contribute in economic growth of a nation through creation of employment opportunities; it also shows that government to contribute positively to the growth of SMES in the study area. The study concluded that SMEs remain an important contributor to the development of Nigeria. Wasiu, (2019) determined the influence of government laws on SMEs productivity in Ibadan Metropolis, Oyo State. The population comprises of about 600 staff of SMEs in six constituencies that makes up Ibadan Metropolis. It adopted stratified and simple random sampling to select 60 respondents for questionnaire purpose. The study discovered that there are various government laws such as government intervention fund through Bank of Industry, incorporating entrepreneurship education into formal education, banned on importation of locally made goods, among others, put in place to alleviate negative effect of environmental factors affecting SMEs productivity in Ibadan Metropolis, Oyo State. Ekwochi, Orga and Okoene (2019) examined the role of government in developing small SMEs in Enugu capital. Survey method was adopted. The data obtained were presented in tables using frequencies and percentages and analyzed using inferential statistics. The findings show that government policy has significance effect on SMEs business and there was challenges facing SMEs businesses in Enugu metropolis such as under capitalization, inadequate planning, and inadequate infrastructure facilities. Zacheus and Omoseni (2014) asceratained the effect of SMEs on economic growth in Ekiti State (2006-2013). Survey research design was adopted. The findings discovered that there is a positive significant connection between SMEs and poverty reduction, employment generation and upgrading in standard of living of people in Ekiti State.

METHODOLOGY

Descriptive research design was adopted. The study was carrying out Anambra state. The population of study comprises 1,200 SMEs in Anambra State the sample size consists of 300 SMEs in Anambra State using Taro Yamane's formula. With respect to this work, the researcher made use of primary sources of data. The major instrument used in this research is the questionnaire. Content and face validity was adopted. The reliability of the instrument was ascertained through the test-retest method and Cronbach's Alpha test. The reliability of the instrument was ascertained at 0.8 which means that the instrument is reliable. The data generated through questionnaires were analyzed using table and percentage analysis. Furthermore, multiple regression analysis was conducted to test the hypotheses formulated exclusively for this study. Regression analysis was conducted to assess the relative predictive power of the independent variables on the dependent variable.

DATA PRESENTATION AND ANALYSIS

Presentation and Analysis of Data

The data to be presented and analyze was based on findings extracted from the questionnaire distributed to the SMEs in Anambra state, Nigeria. The researcher distributed 300 questionnaires to the respondents randomly selected. Out of the 300 questionnaires distributed, 287 were properly filled and found relevant for the study, while the remaining 13 questionnaires were either not properly filled or misplaced by the respondents. This shows a response rate of 95.7%. Likert - type items on a five point scale and open-ended question were employed on the survey to measure the perceptions of the respondents on the effect of government contribution to the development of entrepreneurship in Nigeria. Data obtained were presented using the tabular format and analyzed using percentage method from the analyzed data, Multiple regression analysis is used to test the hypothesis.

ANALYSIS OF RESEARCH QUESTIONS

Question One: To what extent does government credit policy affect the growth of SMEs in Anambra State?

Table 4.3.1: Government credit policy and the growth of SMEs

S/N	STATEMENT	SA	A	N	D	SD
1.	Government credit laws promote the growth of SMEs	94	103	49	22	19
2.	Government credit laws help in encourages the development of SMEs	167	73	39	5	3
3.	Government credit laws contribute to the development of SMEs	100	158	19	6	4
4.	Government credit regulations increased the growth of SMEs	151	98	30	4	4

Source: Field Survey, 2022

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Table 4.3.1 presents the effect of government credit regulations affect the growth SMEs. Regarding the issue bordering on government credit laws promote the development of SMEs, 19 of the total sample strongly agreed, 22 (44%) agreed. However, 103 disagreed, 93 strongly disagreed and 49 were neutral. On whether Government credit regulations help in encourages the development of SMEs, 167 respondents strongly agreed and 73 agreed. On the other hand, 3 respondents disagreed, 5 strongly agreed and 39 were neutral. On questions that bordered on whether Government credit regulations contribute to the development of SMEs, 6 strongly respondents strongly disagreed and 4 agreed. Conversely, 158 agreed, 100 strongly agreed and 19 were neutral. On whether government credit regulations increased the growth SMEs, 151 respondents strongly agreed and 98 agreed. On the other hand, 4 disagreed, 4 strongly disagreed and 30 were neutral.

Question Two: To what extent does government tax regulations affect the growth SMEs in, Anambra State?

Table 4.3.2: Respondent view on government tax policy on the growth of SMEs

S/N	STATEMENT	SD	D	N	A	SA
5.	Government tax regulations added momentous value to empowerment SMEs	17	68	51	73	78
6.	Government tax regulations boost the growth of SMEs	39	41	28	81	98
7.	Government tax laws support the development of SMEs	31	37	80	74	65
8.	Government tax laws create confusion business setting for SMEs	24	55	84	50	74
4.	Government tax regulations increased the growth of SMEs	151	98	30	4	4

Source: Field Survey, 2022

Table 4.3.1 presents the effect of government tax regulations affect the growth SMEs. Regarding the issue bordering on government tax regulations boost the growth SMEs 78 of the total sample strongly agreed, 73 (44%) agreed. However, 31 disagreed, 41 strongly disagreed and 28 were neutral. On whether government tax regulations boost the growth of SMEs, 98 respondents strongly agreed and 81 agreed. On the other hand, 39 respondents disagreed, 41 strongly agreed and 28 were neutral. On questions that bordered on whether government tax laws encourages the development of SMEs, 6 strongly respondents strongly disagreed and 4 agreed. Conversely, 158 agreed, 100 strongly agreed and 19 were neutral. On whether government tax laws increased the growth of SMEs, 151 respondents strongly agreed and 98 agreed. On the other hand, 4 disagreed, 4 strongly disagreed and 30 were neutral.

Question Three: To what extent does government Licensing regulations affect the growth of small and medium enterprises in Anambra State?

Table 4.3.3: Government Licensing regulations affects the growth of SMEs in Anambra State

S/N	STATEMENT	SD	D	N	A	SA
9.	Government Licensing regulations dishearten the development of SMEs	5	8	10	208	56
10.	Government Licensing regulations create business friendly surroundings for SMEs	2	7	10	131	137
11.	Government Licensing laws reduce the price of doing business for SMEs	3	7	79	158	40
12.	Government Licensing laws prerequisite rigid competition for SMEs	4	11	13	172	89

Source: Field Survey, 2022

Table 4.3.3 presents the effect of government licensing regulations affect the growth SMEs, Anambra State. Regarding the issue government licensing regulations dishearten the development of SMEs 56 of the total sample strongly agreed, 208 agreed. However, 5 disagreed, 8 strongly disagreed and 10 were neutral. On whether government licensing laws create business friendly surroundings for SMEs, 131 respondents strongly agreed and 137 agreed. On the other hand, 2 respondents disagreed, 7 strongly agreed and 10 were neutral. On questions that bordered on whether government licensing laws reduce the cost of doing business for SMEs, 3 respondents strongly disagreed 7 disagreed. Conversely, 158 agreed, 79 strongly agreed and 40 were neutral. On whether Government licensing laws provision stiff competition for SMEs , 172 respondents strongly agreed and 89 agreed. On the other hand, 4 disagreed, 11 strongly disagreed and 13 were neutral.

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Test of Hypotheses

The f-statistics value of 6.830 in table 4.4.3 with f-statistics probability of 0.000 shows that the independent variables has significant relationship with the dependent variable. This shows that government credit policy, government tax policy and government licensing policy can collectively explain the variations in growth of SMEs.

Table 4.4.3 Coefficients of the Model

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	18.325	1.834		9.994	.000
Government Credit Policy	.118	.044	.151	2.660	.008
Government Tax Policy	.091	.046	.109	2.980	.041
Government Licensing Policy	.174	.045	.215	3.908	.000

a. Dependent Variable: GDSMSE

Source: SPSS Version 21.0

Table 4.4.3 shows the coefficient of the individual variables and their probability values. Legal environment has regression coefficient of 0.118 with a probability value of 0.008. This implies that government credit policy is imperative in growth of SMEs in Nigeria. Furthermore, government tax policy has a regression coefficient of 0.091 with a probability value of 0.049. This implies that the level of government tax policy is not imperative in growth SMEs in Nigeria. On a similar note, government Licensing policy has a coefficient value of 0.174 and a probability value of 0.000. This shows that the government licensing policy affect the growth SMEs in Nigeria. The summary of the result is presented in the table below.

Hypothesis One

H₀: Government credit policy granted has no significant positive effect on the growth of small and medium enterprises in, Anambra State

H_i: Government credit policy granted has a significant positive effect on the growth of small and medium enterprises in Anambra State

In testing this hypothesis, the t-statistics and probability value in table 4.7 is used. Government credit policy has a t-statistics of 2.980 and a probability value of 0.041 which is statistically significant. Therefore, we reject the null hypothesis and accept the alternative hypotheses which state that government credit policy granted has a significant positive effect on the growth of small and medium enterprises in Anambra State

Hypothesis Two

H₀: Government tax policy has no significant positive effect on the growth of small and medium enterprises in Anambra

H_i: Government tax policy has a significant positive effect on the growth of small and medium enterprises in Anambra State

Government tax policy has a t-statistics of 2.980 and a probability value of 0.041 which is statistically significant. Therefore, we reject the null hypothesis and accept the alternative hypotheses which state that Government tax policy has a significant positive effect on the growth of small and medium enterprises in Anambra State

Hypothesis Three

H₀: Government licensing policy has no significant positive effect on the growth of small and medium enterprises in Anambra State

H_i: Government licensing policy has a significant positive effect on the growth of small and medium enterprises in Anambra State

Government licensing policy has a t-statistics of 3.908 and a probability value of 0.000 which is statistically significant. Therefore, we reject the null hypothesis and accept the alternative hypotheses and conclude that the Government licensing policy has a significant positive effect on the growth of small and medium enterprises in Anambra State

SUMMARY OF FINDINGS

1. Government credit policy granted has a significant positive effect on the growth of small and medium enterprises in Anambra State.
2. Government tax policy has a significant positive effect on the growth of small and medium enterprises in Anambra State..

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3. Government licensing policy has a significant positive effect on the growth of small and medium enterprises in Anambra State.

CONCLUSIONS

The study examines the effect of government policy on the growth of SMEs in Anambra State. Data was sourced from primary sources and analysis using Multiple regression analysis. The result shows that Government credit regulations granted, Government tax laws and Government Licensing policy has a significant positive effect on the growth of SMEs in Anambra State. Therefore the study concludes that government policy has a positive significant effect on the growth of SMEs

RECOMMENDATIONS

Based on the foregoing evaluation of the effect of government laws on the growth of SMEs in Anambra State, the following recommendations will be important in improving the growth of SMEs through government policies.

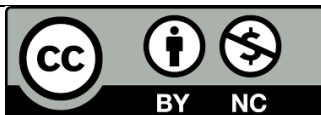
1. Government should reassess its various regulations put in place to alleviate negative effect on credit policy on the growth of SMEs in Anambra State, Nigeria.
2. Government should develop a system for tax payment so as to improve competence in tax compilation and payment.
3. Government should rationalize the licensing process and reduce the licensing requirements.

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Mental Health during COVID-19 Pandemic and its Effects on Migrant Laborers, Women and Adolescents in Southeast Asia: A Qualitative Review



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ABSTRACT

Objective: The COVID-19 pandemic has affected the physical, mental, and social well-being of millions of people across the globe. This paper will discuss the impact of COVID-19 on preexisting and emerging mental health issues amongst various subgroups of the vulnerable population in Southeast Asia.

Methods: Qualitative review of existing knowledge on mental health issues during COVID-19 pandemic among migrant laborers, women and adolescents.

Conclusion: Given the profound impact of COVID -19 beyond physical health, policy makers, scientific communities and faith-based institutions should make every effort to turn the COVID-19 crisis into an opportunity by developing a strong and robust consensus that is based on building public trust in partnership to provide societal mental health, which is an unappreciated asset of a nation. We conclude that while there is considerable amount of work in the field of mental health has been done, many efforts are siloed, and do not consider the unique cultural characteristics involved. In addition to providing ventilators and acute care to COVID-19 affected patients at the hospitals, we need to design policies to allocate resources for the post-pandemic burden on our communities and develop multi-disciplinary approaches. We suggest that these approaches should become routine in healthcare settings and should be appropriate to the individual's cultural context. We argue that the generation of robust data, scientific evidence, and multi-disciplinary resources-sharing are required that would necessitate to produce the interventions that are culturally specific and scalable.

KEYWORDS: COVID 19, mental health, vulnerable population

BACKGROUND

Dr. Benjamin Miller, chief strategic officer at Well Being Trust foundation, USA who works with Graham Center for Policy Studies in Family Medicine and Primary Care says, "COVID-19 has come in as a multiplier of social, economic factors that is making deaths of despair even worse". So called word, "deaths of despair", coined for the deaths by suicide, or associated with alcohol and drug use that are related to socio-economic fallout. George Everly PhD, a psychologist from Johns Hopkins School of Medicine suggests the long-term consequences of the pandemic and ensuing mental issues typically begin weeks or months after the pandemic's peak of infections, when deaths of despair usually rise. Unfortunately, the recurring waves of the pandemic are leaving with little time to address or note these deaths of despair. Nearly 182,000 people died from deaths of despair in 2019.¹ Some predictive models indicate additional 75,000 additional deaths during to COVID-19 pandemic and continued paucity of mental services. The

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stakes could not be higher. If not adequately or appropriately addressed, the mental health consequences for a generation of children and young people could far surpass the immediate health and economic impact of the COVID-19 pandemic, leaving long-term social and economic consequences in its wake.²

This paper aims to explore the prevalence of mental health issues in vulnerable populations that are either exaggerated or unmasked by COVID-19 and gives a bird's eye view on how social determinants play in a specific Southeast Asian context. Although many of the mental health issues are applicable to various degrees of severity to various vulnerable population, this paper will focus on migrant laborers, women and children and adolescents.

MENTAL HEALTH IN GENERAL

"There is no health without mental health." – the World Health Organization (WHO) proclaimed this sentiment in 2018, which has become profoundly striking in the times of the pandemic.³ Lester Breslow, a highly acclaimed public health expert who has done notable work on measuring health, declared the future of health - it is not just preventing and treating diseases; it is about expanding social resources for mental health.⁴ He underscored that health equity challenges would require caregivers to rethink their assumptions, and see the health through the lens of communities.⁵ According to WHO, mental well-being is more than the absence of mental illness. Without a long term coordinated mental health policy, there will be debilitating effects on the majority of vulnerable population.⁶

"There are known knowns. there are known unknowns. But there are also unknown unknowns, the ones we don't know we don't know, ⁷ according to Former Secretary of Defense Donald Rumsfeld. Likewise, the unknowns in terms of public health, and its implications will keep piling up to reveal themselves over time. COVID-19 has created a greater deal of stigma, mainly due to a lack of awareness about how the disease spreads and attacks the human body. As with any community trauma, the most vulnerable populations of a community have suffered the most negative impacts during the COVID-19 pandemic. Investing in improving mental health increases productivity by gaining more robust personal relationships and a sense of belonging.⁵

Mental health is difficult to describe and define – the definitions of poor mental health, mental illness, and mental wellbeing are not consistent among populations, and even between people within a population.⁸ It is possible that someone with poor mental health may never be clinically diagnosed with mental illness. There are several definitions of mental health; specifically, the WHO definition of mental health revolves "a state of well-being in which the individual realizes his or her own abilities, can cope with normal stresses of life", ^{9,10} but misses an additional element of effects of dynamic nature of mental health that revolves around the human experiences to cope with the adverse life events and maintain state of internal equilibrium.¹¹ To assess dynamic nature of mental health, the existing diagnostic methodology will need to be redefined. In contrast to physical conditions, where determining cause-and-effect can be straightforward, mental health conditions present a challenge at that front. This is partly because of legal, economic, insurance justifications that are made in compliance with the Diagnostic and Statistical Manual of Mental Disorders (DSM).¹² One definition of mental health revolves around the concepts of self-realization, mastery over the environment, and autonomy but this view has had criticisms for being overly Western-centric. ¹⁰ As can be expected, sociocultural factors come into play, as do differences in perception that is not uncommon when it comes to seeking help for mental health issues. The Mental Illness Stigma Framework (MISF) has provided a structural foundation to define stigma surrounding mental illnesses, and has concluded that while some aspects of stigma such as stereotyping and discrimination have been somewhat studied, others that describe the internal state of the person with mental illness (e.g., internalized stigma) have been studied less so.¹³ Perspectives of the stigmatizer and the stigmatized need to be considered, as they may vary depending on the culture and other surrounding factors.¹⁴ Given the rootedness of mental health in a specific cultural setting, social cohesion play a stronger role in mental health perception. This will define available resources and help-seeking strategies, the as well as community support.¹⁵ These aspects come into play when we think of a heavily community-oriented cultures (e.g., some countries in Southeast Asia) vs. cultures that are perceived more individualistic (e.g. some cultures in the Global North). This leads us to wonder if there can ever be a universal understanding of mental health and mental well-being. Ethnic practices, regional culture play a role when thinking about mental health for vulnerable people within a given community.¹⁶ Given that diverse ethnic minorities in the various countries across the globe, makes acceptability of the definition and management of mental health illnesses one think of the challenging, although basic physiological components of mental health recovery that are universal ¹⁷ This brings us to another facet of mental health, which is that the state of a person's mental wellbeing can change over time, which means that help-seeking strategies, and support required also change over time. The intersection of mental health with age, ability, sexual orientation, gender identity, and race are well-documented.¹⁸ The intersectional role of factors in mental health also means that there are underlying intersectional inequalities beyond mental health.¹⁹

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Mental well-being is essential to maintain personal well-being. There is an intricate link between mental and physical health, so that mental illnesses can negatively impact a person's ability to maintain positive health. Chronic physical disorders such as diabetes and hypertension are often associated with poor mental health, furthering the connection between mental and physical health.²⁰ Resilience, colloquially termed as "bouncing back" can be defined as the capability to "adapt well in the face of adversity, trauma, threats, and significant sources of stress".^{21, 22, 23} While it is not easy to predict who will go on to develop a mental illness, there are specific populations that are at a greater risk of mental illness.²⁴ There are protective factors when it comes to mental health and wellbeing, and while we cannot prevent mental illnesses, a culture of promoting mental well-being starts in childhood/adolescence; this is because of the impact of early childhood experiences can lead to mental disorders later in life. While there are nuances, individuals with a history of multiple childhood adversities are more susceptible to common mental disorders later in life.^{21,22,23} Studies have found that childhood maltreatment in a specific population increases risk of major depressive disorder (MDD), generalized anxiety disorder (GAD) and drug use disorder (DUD).²⁵ In short, mental health is an enormously complicated topic with varied facets. The determinants of mental health and wellbeing are many, e.g., age., gender identity, caste, economic status, and stigma.²⁶ The real brunt of a catastrophic event such as COVID-19 is always felt by vulnerable populations due to socio-economic conditions preceding and succeeding the pandemic. The dehumanizing effects of a massively traumatic event like COVID-19, as well as PTSD, depressive and anxiety disorders, have exposed hidden mental issues that otherwise would have been ignored.^{27, 28}

MIGRANT LABORERS

The migrant workforce is one of the vulnerable population sectors that are receiving the brunt of COVID-19 and more susceptible to exaggerated mental health conditions. The definition of migrant labor has been vague and represents a complex combination of caste/race, communal segregation that has been variously called based on the region of origin such as "Yanadi" in Andhra Pradesh, State of Southeast India, "Dalit" from Haryana, Northeast part of India.²⁹ The sudden decision by the South-east Asian countries to impose a nationwide lockdown within hours came with massive, unintended, and catastrophic consequences to the migrant labor that make up informal economy in South east Asian countries. . The sudden lockdown policy stranded and led to the massive overnight unemployment of these daily wage laborers. The conservative estimate of unemployment rate was 23% in India. ³⁰ The International Labor Organization (ILO) estimated that 400 million informal laborers would be pushed to worsening poverty due to COVID-19.³¹ In Indonesia, there was a sudden surge in anxiety disorder among single and non-married migrant workers; the nuance here is that Indonesian migrant workers who are single or have no family support are likely to suffer from anxiety. This sudden increase in anxiety was more prevalent among people with low educational attainment. Similar findings were observed among farmers, fishermen and other low income labor population who are predominantly migrants.³² Although there is no computed data on mental health among migrant labor forces, uncertainty about their job prospects, fear of deportation, fear of lack of resources to support themselves and loved ones had put them in a more vulnerable position to suffer from mental health issues. According to Nelson Vinod Moses, Founder of Suicide Prevention India Foundation, there has been substantial evidence of increased prevalence of suicides and other mental health disorders in rural India due to massive return of migrant workers and the farming community.³³

WOMEN

Southeast Asian countries rank one of the lowest women workforce participation rates in the world. In addition, the lockdown has affected predominantly women primarily because of social isolation and domestic violence.³⁴ In the broader discourse on public health, women, both maternal physical and mental health, are usually overlooked. It is estimated that nearly 35 percent of women worldwide suffer from depression during pregnancy and postpartum. Pregnant women and new mothers are at an elevated risk of suffering from mental health problems. It has been observed that the uncertainty surrounding COVID-19 has led to higher levels of depression among women during and after pregnancy. Pregnant women may feel social isolation and have a greater fear of infection for themselves, as well as their infants. Lack of health facilities and increasing number of home deliveries, without the assistance of trained health workers could have heightened the distress and depression in these women. Gender-based exclusion and denial of the right to express themselves have intensified during COVID-19. Numerous studies have shown the effects of COVID-19 in exaggerating prevalence of depression and anxiety in the perinatal period.³⁵ In addition, here is evidence in increased cases of domestic violence on women.³⁶ The domestic violence encompasses physical and psychological violence although the later often remains undetected. Countries like Bangladesh and other southeast Asian countries saw increase in intimate partner violence also called "wife beating" during lockdown period of pandemic. The implicit nature of the challenge is there is lack of safe place to call the helplines despite availability of numerous call centers and helplines, access to smartphones.^{37, 38}

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Speaking to differences even among individuals in the broader group of women, elderly women and widows continue to be more affected by the COVID-19 pandemic. Given that women take up most of the caregiving burden in households, women worldwide have suffered from those responsibilities in the face of a lack of access to childcare due to social distancing and isolation. In India, patriarchy, child marriage, quest for a male child, living with in-laws, "joint family", widowhood, lack of rights, domestic violence, effect of role transition, dowry deaths, etc. Depression as the most common women's mental health problem.³⁹ In Taiwan one estimate suggests that 78% of Taiwanese women have had an episode of depression, and that this risk was greater in immigrant Taiwanese women. Domestic violence and ensuing post-traumatic stress syndrome, family pressures, negative interactions between family members have all been suggested for this phenomenon in Taiwanese women.^{40 41 42}

ADOLESCENTS

Mental health disorders are the leading factor of disease burden among people between ages of 10-24 years. Additionally, those living in poverty are twice likely to suffer from mental health problems compared to average income population.⁴³ Children and adolescents suffer from isolation and loneliness with increased the risk of depression, as well as the possibility of anxiety at the time of loneliness. Marginalized children and adolescents are believed to be susceptible to mental health risk.⁴⁴ Several mental health problems in Indonesian adolescents such as anxiety and sleep deprivation were also found in the early of pandemic.³⁴ The duration of loneliness was strongly correlated with mental health symptoms than the intensity of loneliness. The investigators found young people were as much as three times more likely to develop depression in the future due to social isolation, with the impact of loneliness on mental health lasting up to nine years later.⁴⁵ In addition, young people living in poverty suffer from multiple disadvantages including violence, lack of basic educational and employment needs and hence limited future life opportunities and put them in poorer mental health.⁴⁶ Monetary poverty is associated with increased risk of depressive disorders in young people.⁴⁷ Additionally, such mental health deterioration among young people has pushed them to worsened poverty due to increased healthcare spending and loss of already-compromised employment. Social causation and social drift reinforces poverty and depression cycles.⁴⁸ During the quarantine period in the Philippines, researchers reported that adolescence females tended to have poorer mental health status compared to other populations. Deprivation of necessities for wellbeing that is exaggerated by pandemic is highly associated with depressive disorders among young primarily triggered by uncertainty. This calls for further understanding of underlying factors that are either contributing or not contributing the mental health crisis.⁴⁷

LIMITATION OF THE PAPER

This paper does not address clinically diagnosed mental illnesses and identity-based exclusion during COVID 19. The mental illnesses related to inadequate basic physical amenities such as water, latrine facilities are not addressed in this paper. The Southeast Asian geographies were chosen because of the authors' affiliations and experiences. In order to retain the focus of the paper, we have limited our commentary to few vulnerable populations. Migrant laborers, women and adolescents were discussed as they constitute a vast majority of the population. However, we do not suggest that each of these groups is a monolith, so even within each group, there are specific considerations such as single women, adolescent women, married women, and those that have been widowed. While we have not discussed at each of these segments in specific, there are intersectionality and overarching principles that can guide our understanding of the mental well-being. Additional work is needed to study and address the mental health consequences of these diverse and varied populations and topics.

CONCLUSION

The COVID 19 crisis in southeast Asia has brought a century old discussion of mental health of individuals and communities to the forefront. Given the situation where the world stands amidst, global pandemic, economic slowdown, and unaddressed mental health crisis, a multi-disciplinary and multi-stakeholders collaboration to address mental health is essential. Given the profound impact of COVID -19 beyond physical health, policy makers, scientific communities and faith-based institutions should make every effort to turn the COVID-19 crisis into an opportunity by developing a strong and robust consensus that is based on building public trust in partnership to provide societal mental health, unappreciated asset of a nation. Most importantly, all initiatives for improving mental health should integrate empowerment of the most vulnerable groups and social integration. In addition to providing ventilators and acute care to COVID-19 affected patients at the hospitals, we need to design policies to allocate resources for the post-pandemic burden on our communities and develop multi-disciplinary approaches. We suggest that these approaches should become routine in healthcare settings and should be appropriate to the individual's cultural context. We argue that the generation of robust data, scientific evidence, and multi-disciplinary resources-sharing are required that would necessitate to produce the interventions that are culturally specific and scalable.

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Using Alexa to Differentiate Instruction in the Special Education Classroom



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ABSTRACT: Access to technologies and understanding the potential uses of technology to differentiate instruction have been a concern for the teachers and students in a local school district located in the southeastern United States. Despite the emergence of digital voice assistants (DVAs) as tools for instructions, teachers lack knowledge and strategies for using DVAs to differentiate instruction in their classrooms. The purpose of this basic qualitative study was to identify teacher knowledge and strategies employed among special education (SPED) teachers using DVAs to differentiate instruction in their classrooms. The concepts of Carol Tomlinson's differentiation theory and Mishra and Koehler's TPACK framework served as the foundation of this study. The research questions examined middle school SPED teachers' perceptions of challenges using DVAs to differentiate instruction, resources, and strategies available to these teachers and their perceived knowledge of using DVAs to differentiate instruction. In this basic qualitative study, data were collected from 6 SPED teachers using semistructured interviews. The findings suggest that teachers had little to no perceived challenges when using DVAs to differentiate instructions. However, the overutilization of DVAs might rob students of their ability to think independently. This study offers several prospects for future research related to the topic and findings. Further research is needed at the elementary and high school levels that may include core content teachers.

KEYWORDS: Special Education, Differentiated Instruction, Learner-Centered, Classroom Instruction, Special Education Learning, Digital Voice Supports.

I. INTRODUCTION

Access to technologies and understanding the potential uses of technology to differentiate instruction has been a concern for the teachers and students in a local school district in the southeastern United States (U.S.) (Assistant principal, personal communication, July 3, 2019). The local school district comprises of 14 schools, including three elementary, three primary, two middle, one middle-high, two high, and three vocational schools. The school district enforces the "bring your own device" (BYOD) policy. This policy enables students to bring personal learning devices to offset the district's lack of technology (Teacher, personal communication, March 6, 2019).

The problem is that despite the emergence of DVAs as tools for instruction, teachers lack knowledge and strategies for using DVAs to differentiate instruction in their classrooms. The local district requires policies and guidance on how DVAs can or should be applied. The local school district does not mandate the use of DVAs; however, with a lack of technological resources and training on how to effectively differentiate instructions, teachers are forced to be creative in incorporating technologies to differentiate instructions to meet a 4.0 rubric requirement (SPED teacher, personal communication, February 2, 2019).

Additionally, Cantrell et al. reported that from a survey conducted, the local school district studied responded to the survey question, "number of schools in each district reporting no 1: 1 computing capability in the school" (para. 3)¹. A total of seven schools reported having one-to-one student computing capabilities from a total of 14 schools that make up the district. These numbers show that 50% of the total schools do not have one-to-one student computer technologies. The report also stipulated that many districts misunderstood the question related to BYOD versus district-assigned devices. Hence possibly overstating their one-to-one computer technology.

How well teachers differentiate or tailor instructions to meet the need of their students is important to evaluate². Students with learning challenges have varying difficulties, frequently covered up or inconspicuous, that influence learning their entire lives³.

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There is a remarkable reduction among students with learning disabilities when compared to general education students that use technology to differentiate instructions³. Reports indicate that a small proportion of learning-disabled learners receive assistance from computer technology to help their learning results⁴. SPED educators' sentiments of readiness ground their technology usage while working with students with learning challenges⁵. Additionally, research showed that there is a lack of time, resources, and support from the administrative or leadership body of schools, which prompts a lack of computer usage by SPED teachers⁵.

AI is not particularly new to the field of education. For example, AI has been used in education to create MOOCs, learning analytics, intelligent tutoring systems, education data mining, and computer-supported collaborative learning (CSCL)⁶. However, with the introduction of AI technologies such as DVAs and chatbots, AI has become an increasingly popular instructional innovation used in classrooms to facilitate different learning experiences⁷.

Consequently, these technologies are used within middle school classes to aid pedagogical development⁷. Furthermore, more than half a million students are enlisted in courses designed with AI, such as cognitive tutors in software, web-based applications, or stand-alone interfaces in more than 3,000 schools annually⁸. AI in education is making significant progress in terms of technological advancements⁹. However, its effect on students learning outcomes has little to no data to support its usage in instructions in this school district. Moreover, DVAs inclusive of Amazon Alexa and Google Home, among others, are used in lessons without adequate data to support their benefits in the classroom¹⁰. Understanding and academic information to assist students and their instructors in the learning process using DVAs is developing¹¹. The effects of AI in differentiated classrooms, where instructions tailored to their students' unique learning needs and learning style were obscure or less explored related to SPED instructions¹².

II. METHOD

The purpose of this basic qualitative study was to explore teachers' perceptions, knowledge, and strategies employed among SPED teachers using DVAs to differentiate instruction in their classrooms. Additionally, throughout this study, knowledge gaps and missing/required strategies were exposed to improve implementation. A foundation on which policies and guidance can be developed and implemented within the local context was identified. Understanding the usage of these technologies in the classroom may offer teachers information regarding the benefits and or limitations that DVAs have on pedagogy.

The following research questions addressed the basic qualitative study:

RQ1: What are the perceived challenges faced by middle school SPED teachers using DVAs in differentiating instructions in SPED classrooms?

RQ2: What resources and strategies are known to be available to prepare middle school SPED teachers for differentiating instructions in SPED classrooms using DVAs?

RQ3: What is the perceived knowledge of middle school SPED teachers related to the usage of DVAs to differentiate instructions in the classroom?

Sampling

Using purposeful sampling, participants for this study included high a selected sample of 10 to 12 SPED teachers to participate in the study; however, six teachers ultimately engaged in face-to-face or virtual semistructured interviews to collect data on their perceptions of the use of DVAs in instructions. Also, insight into how SPED teachers planned and incorporated this innovation to individualize instructions and cater to the needs of unique learners was explored. The study was conducted in a rural school district; there were three middle schools with 18 SPED teachers. The study population was limited to the middle school level and SPED teachers; any further limitation may have hindered or affected the number of participants in the study. Since the available pool of eligible teachers to participate in the study was small, it was only realistic to recruit an acceptable amount of 10 to 12 participants to participate in the study.

Data Collection

In this study, semistructured interviews were conducted with SPED teachers to gauge their perspective on using DVAs in their instructions. Interviews enable the researcher and subjects to dig deeper and uncover a more personal and descriptive understanding of the phenomenon investigated that may not be identified easily from observations¹³. These were semistructured interviews that were face-to-face and virtual for participants' convenience.

The face-to-face interviews lasted between 25 and 40 minutes, while the virtual interviews lasted between 23 and 30 minutes. The Otter app equipped with AI technology was used to record and simultaneously transcribe interviews. For the face-to-face interviews, an iPad pro with the Otter app was used installed to record and transcribe the interviews. However, for the virtual interviews, Facetime or Zoom on the iPad Pro was used for loud, crisp, and clear sound quality and recorded and transcribed on a

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cell phone with the Otter app installed. Member checking was conducted by providing the completed transcriptions to the participants for verification and accuracy and an accurate representation of their perspectives.

III. METHODOLOGY

During the data analysis phase, five overarching themes emerged. These themes were: (a) differentiation in SPED content, (b) selecting appropriate technology, (c) DVAs in action, (d) TPACK and differentiation, and (e) preparing and training teachers with technologies. The following themes emerged:

Research Question 1

The first research question was: *What are the perceived challenges faced by middle school SPED teachers using DVAs in differentiating instructions in SPED classrooms?* After analyzing the interview questions that corresponded with this research question, the findings suggested that teachers had little to no perceived challenges when using DVAs to differentiate instructions in SPED classrooms. However, participants' challenges were a lack of independence, disruption, technology failure, and privacy. Participants believed that the overutilization of DVAs might rob students of their ability to think for themselves. Since students ask the questions, and the device responds without probing, or follow-up questions like teachers do, there is no need for them to use brainpower to process information. This finding is consistent with current literature. Only a few of the publicly available apps discovered in the instructional segment of app stores had significant evidence to support the design and overall effectiveness towards learning outcomes but rather concentrating on rote academic abilities (memorization of picture-word association, numbers) instead of focusing on existing core curriculum materials and or instructions¹⁴.

Additionally, if not appropriately implemented, DVAs can be disruptive. The device may not understand a question asked by students, and students usually increase their voice levels and become frustrated in such instances, disrupting the classroom. Also, if there is more than one device in the room with the same wake word, such as "Hey Google" or "Alexa," this will trigger the device(s) that might not be in use. Also, the findings indicated that participants were not concerned about privacy, except for one participant who reported that "privacy is always an issue whenever you are using something that is attached to the internet," but has not had any issues as it relates to privacy. This finding does not correspond with the current literature. When one interacts with Alexa, the Echo streams sound to the cloud. The storage space of Alexa's raised a plethora of concerns around privacy and security¹⁵. However, participants suggested that when these devices are not in use, they are unplugged and muted, so they are not listening, and Siri is not always listening because it is manually activated.

Research Question 2

The second research question was: *What resources and strategies are known to be available to prepare middle school SPED teachers for differentiating instructions in SPED classrooms using DVAs?* After analyzing the interview questions that corresponded with this research question, the findings suggested that teachers have not received any training from their school leaders or district. Since the school district has limited resources, the district does not provide teachers with DVAs. As such, all strategies used to implement these devices to inform their instructional practice and cater to the need of their learners were self-taught. Teachers pulled from their experiences with personal devices used at home and knowing the students they have to engage them in the classroom with DVAs. The findings echoed the sentiments of the need for support from school leaders and or administrators. While educators direly need this fundamental knowledge and skillsets to differentiate instructions effectively, the administrators and department heads likewise need to realize how best to support teachers with cutting-edge practices to deliver rigorously and Dis¹⁶. Schools or school districts with limited technological resources constitute a significant blow to teachers' effective implementation of technology in the classroom¹⁷.

This finding confirms the literature on the support teachers needs to implement technology in their instruction effectively. Teachers should receive step-by-step instructions on how to differentiate in their classrooms and provide teachers with access to data necessary to differentiate instructions effectively¹⁷. Teachers influence students' engagement in the classroom by using technology-aided devices and tools¹⁸. Interactive writing activities, as well as educational games contribute to increased student engagement. Used to assist in the teaching and learning process, technology infuses learning environments with cutting edge learning devices, for instance, personal computers (PCs) and smart devices; broadens interactions in online courses, experiences, and learning materials; supports learning 24/7; produces 21st-century skills; extends students responsibility and motivation, and also speeds up the learning process¹⁹.

Research Question 3

Research question three was: *What is the perceived knowledge of middle school SPED teachers related to the usage of DVAs to differentiate instructions in the classroom?* After analyzing the interview questions that corresponded with this research question, the findings suggested that teachers are very knowledgeable of their students, the content they teach, and the materials and technology they select for use in SPED classrooms. The findings indicated that teachers possess the requisite

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technological, pedagogical, and content knowledge needed to implement and use DVAs to differentiate instructions successfully; however, they noted that more formal training is necessary to iron out the nuances when implementing and using these devices. The literature suggested that the teaching of content-specific information and abilities necessary in the differentiation process incorporate learning about a plethora of pedagogical models and instructional strategies and tips on how to execute and modify these lessons to meet the specific learning needs of students^{15,18,20}. This finding also aligns with Tomlinson's (2014) four tenets of the differentiation process: content, process, material, and learning environment.

Additionally, the TPACK framework serves as a lens that educators can use to understand technology integration as the interplay between technology, pedagogy, and content²¹. The knowledge of technology, pedagogy, and content helps guide educators on the tendencies, affordances, and limitations of technologies, allowing them to be better suited for specific tasks over others²¹.

IV. IMPLICATIONS FOR FUTURE RESEARCH

As AI and DVAs are rapidly expanding in the consumer market as well as in the field of education, there has been an increase in the usage of these devices to inform and differentiate. The education field is a pioneer in adopting technology to meet the high demands and create opportunities for learning in the 21st century and beyond. The outcome of this study has the potential to guide school and district leaders in developing policies, protocols and arrange training and or professional development for teachers to differentiate instruction with modern assistive technology effectively.

Moreover, teachers support the use of DVAs, as they believe it responds to a demonstrated need. However, the data suggested that teachers need more support from leaders to aid them in implementing differentiation to help students be successful. Also, the state 4.0 rubric used to assess teachers on their instructional practice focuses on using technology and differentiation as a grading point for teacher evaluations. Therefore, to affect positive social change, schools and school district leaders should consult with teachers to increase the availability of DVAs for instruction and provide training and professional development. The data presented that only one of six participants reported school district professional development support. Not only are teachers insufficiently supported, what teachers have learned on their own is not being shared with other teachers. Hence, this study sets the precedence for social change by offering both the opportunities for teachers to participate in professional development activities as well as teachers on the leading edge could lead professional development initiatives to share their knowledge with colleagues.

Furthermore, the schools or school districts could appoint expert teachers proficient in the use of DVAs, and differentiation to training new and struggling teachers. From this initiative, schools could develop a mentorship program. A professional development session to be productive and successful, the teachers should be actively involved in taking their different learning needs and actively be part of various opportunities for learning that specifically focused on their school, and continuously support a collaborative teaching and learning process²⁰.

Finally, the data suggested that teachers did not have a voice in selecting the technology for use in their classrooms. However, they expressed their preference for being a part of the technology selection process. Since learners are so diverse, it would be desirable to get teachers involved in choosing the most effective technology that complements their skill set as well as what caters to their learners' needs. This research study may provide school leaders with an understanding of the importance of the teacher's voice when selecting classroom technology for differentiation in their classroom instructions based on students' needs. As such, school leaders may develop a committee to gather data on teachers' opinions on selecting new or currently used technologies that may impact the learners' success in their classrooms.

V. CONCLUSIONS

The data presented in this study came from semistructured interviews conducted with six SPED teachers in a rural school district in a southeastern state. The data were analyzed to identify teachers' perceptions, knowledge, and strategies employed among SPED teachers using DVAs to differentiate instruction in their classrooms. The data signaled that teachers use these devices to cater to the needs of their students based on their learning styles. Teachers using DVAs with their auditory learners expressed the most benefits. Additionally, teachers reported that using DVAs to differentiate instruction acknowledged that the devices engaged students more in the lesson or activity it is being used for. Learners tended to pay more attention or got quiet to interact and listen to the responses coming from DVA devices. Also, teachers suggested that using DVAs can afford SPED learners with the ability to be independent, which is relying on the teacher less when they have specific questions.

However, the data presented that prolonged or overuse of these devices may rob students of their independence to think for themselves. The data suggested that teachers had little to no concerns about the privacy issues with using these devices in an educational setting. For teachers to successfully implement DVAs in the classrooms, they recommended setting up strict classroom rules and protocols before using these devices to differentiate or any instructional purpose. The data also presented

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that teachers have not had any formal training in using DVAs for instructional purposes and suggested that schools or district leaders look into the possibilities of adopting these technologies and train teachers on how to use them on the possibility of meeting the needs of students with learning disabilities by harnessing the power of technology.

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The Contribution of Alexander Arkadievich Feinberg's Work to Literature



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ABSTRACT: Alexander came from a brunette family and was a blue-eyed, gorgeous young man. The well-known poet begins to show his potential at a young age. He was enrolled in the journalism department of Tashkent University's Faculty of Correspondence Philology. He's also the author of works that have been published in Tashkent, Moscow, and St. Petersburg. Alexander Feinberg is unquestionably one of the most prominent figures in Uzbek poetry. His name and work are totally irreplaceable among Uzbek fans and poets. In Feinberg's poetry, the historical and present eras, the West and the East, nationalism and internationalism, and the West and the East were all united to create a separate aesthetic domain. Feinberg's lyrical protagonist is a kind character who has maintained his human traits in the face of historical and societal calamities, who is always prepared to lend a helping hand and who suffers from the world's bad conditions. Feinberg's poetry is a synthesis of significant aesthetic achievements by Russian and European poets. His creative approach is influenced by the traditions of traditional Eastern poetry. Feinberg's method is characterized by artistic translation as well. Alexander has also written the scripts for almost fifty documentaries and seven feature films. Based on a script by Alexander Feinberg, four feature films and over twenty animated features have been produced.

KEY WORDS: Alexander Feinberg, poet, poems, books, epic, collection of poems, protagonist, films, animated films, script, literature, rhythm, writes, journalism, award, produce.

INTRODUCTION

The Feinberg family's story begins as follows: his father was born in Gatchina, near Sankt-Petersburg, in 1891, while his mother was born in Moscow in 1904. His parents had not escaped the atrocities of what was referred to as "mass repression". Indeed, the author's parents met as a result of the Siberian exile, which drew a substantial number of people during Stalin's leadership. When the scent of Kolima reached Novosibirsk, the poet's parents recognized that the Feinberg surname was not right for surviving the German troops during the Second World War. Two pieces of paper were put in the poet's three-year-old brother's hat. The first writes "Chisinau," whereas the second has "Tashkent." The Feinberg family's eldest son picked "Tashkent," which rescued the whole Feinberg family. Consequently, they arrived in Tashkent in 1937 and two years later, on November 2, 1939.

The Russian and Uzbek people's poet Alexander Arkadievich Feinberg was born in Tashkent.

Alexander was a smart, blue-eyed, and handsome boy from a brunette family. His childhood was spent on the former Zhukovskiy Street. Alexander Feinberg studied at Tashkent Topographic College after graduating from a seven-year school. After graduating from technical college, he served in the military in Tajikistan to protect his masculinity in his homeland.

Afterwards, he was accepted into Tashkent University's (now the State National University of Uzbekistan) Faculty of Correspondence Philology's journalism department, where he worked for the university newspaper. In 1961, he met Inna Glebovna Koval, his future wife, a talented journalist with a high level of education and intelligence. She always becomes the poet Alexander Feinberg's first reader and an honest critic. We can still see proof that the poet chose a trustworthy partnership since Inna Glebovna remains to effectively communicate the poet's work to fans today.

Alexander graduated from Tashkent State University in 1965 with a degree in journalism. His work is extremely variegated. He has also written books that have been published in Tashkent, Moscow, and Sankt-Petersburg. Artistic translation is yet another prominent feature of Feinberg's approach. Alexander has also scripted approximately fifty documentaries and seven feature films. Four feature films and more than twenty animated features have been created based on a script by Alexander Feinberg.

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Alexander Arkadyevich Feinberg died on October 14, 2009 at his home in Tashkent. He was buried in the communist part of Botkin Cemetery in Tashkent.

MAIN PART

"Literature indicates not just the heart of the people, but also their spirituality. In today's complex world, it is necessary to find a way into the hearts of people and use the influential power of literature to inspire them to noble goals. We will create all the conditions for studying the heritage of our ancestors and creating great literature worthy of our great culture" Shavkat Mirziyoyev noted. Because of the President's concentration on literature, it prompted me to write about an author who contributed to the literature of the Russian and Uzbek peoples.

At a school age, the well-known poet begins to demonstrate his potential. When Alexander Feinberg's reading of Pushkin's works surprised and captivated everyone, the poet's peers were conducting a monotonous conversation about the poems. Alexander's voice was alive and distinctive, and whenever he said something, he immediately assumed the position, bringing the images and occurrences to reality, just like in a movie. Even before that, he could sense the significance of each word and the poem's rhythm. Feinberg exemplified the friendly linkages that existed between the Uzbek and Russian peoples.

Alexander Feinberg is undoubtedly one of Uzbek poetry's brightest stars. Among Uzbek fans and poets, his name and work are absolutely irreplaceable. His poems have appeared in publications such as "Change", "Youth" ("Yunost"), "New World" ("Noviy mir"), "Eastern Star" ("Zvezda Vostoka"), and "New Volga" ("Novaya Volga"), as well as internationally published in periodicals magazines of the United States, Canada, and Israel. He was engaged by the Writers' Union of Uzbekistan after the publication of his first poetry collection ("Etude"). He served as a consultant for the Uzbek Writers' Union from 1965 to 1969. *Etude* (1967), *Second* (1969), *Poems* (1977), *Far Bridges* (1978), "Answer" (1982), *Short Wave* (1983), *Spreading net* (1984), and *Free Sonnets* (1990) are among his fifteen published collections of poetry in Tashkent, Moscow, and St. Petersburg. Giving in to a very contemporary literature was really quite acceptable in Soviet times. Feinberg was on a list of famous poets at the time, including Andrei Voznesensky and Rimma Kazakova. In Feinberg's poetry, the historical and contemporary periods, the West and the East, nationalism and internationalism were combined to create a distinct aesthetic realm. Feinberg's lyrical protagonist is a compassionate individual who has been able to fully preserve his human qualities in the moments of historical and social catastrophes, who is always willing to offer a helping hand and who suffers from the world's unpleasant circumstances. Feinberg's poetry is a confluence of Russian and European poets' outstanding artistic accomplishments. The traditions of classical Eastern poetry are no stranger to his creative style.

One of the poems written by the poet to change him and others is the sonnet "Language". As you read this sonnet, the lyrical protagonist, who is silently watching the events of human life without any resistance, comes to life. In this regard, I remembered the following words of the first President, Islam Karimov: "One should be afraid of a person who is neutral and indifferent to what is happening around him or her."

Feinberg's poetry has a lighthearted tone that is humor. He characterized the unchangeable palov of the Uzbek teahouse with such a laugh in the epic "Ruboiy tori," so it's no surprise that it can't be read without a bright smile. You turn back to reading his material, and you're astonished to find out how little you know about him... As you turn the pages of the book, you may glimpse the abyss, the undefined voices of poetry...

There are only a few photographs of Alexander Arkadievich, predominantly from public appearances on the Internet. Of course, we can't ignore the fact that his appearance has been affected by his age. You can see the deep wrinkles on his face... But it's just a photo. I can assure you that he will not create the impression of being an elderly man. His personality is that of a juvenile. In this country, he became a poet and rediscovered his homeland. For him, the theme of the Uzbek community was fundamental, and he worked on it all throughout his life.

Alexander Feinberg, a remarkable translator, has introduced Russian-speaking readers to several masterpieces by well-known Uzbek poets. Alexander's work features a variety of creative translations. Alisher Navoi's epics and poems, as well as other current Uzbek poets' works, have been translated into Russian by the poet, who is well-versed in Uzbek poetry. In Moscow, Erkin Vahidov's epic "Rebellion of Spirits" was published. "Wedge Swans," a collection of poems by Abdulla Aripov, Khosiyat Rustamova, Sirojiddin Said, and Omon Matchon, was published in Tashkent. It is noteworthy that Alexander Feinberg's poems were translated into Uzbek and published under the name "Chigir."

The poet's publication opportunity was shut down for seven years on one day owing to his non-standard behaviour, and this circumstance inspired him to generate film scripts. A total of four feature films and twenty animated features have been produced. He has made seven feature films at the Uzbek film studio: "My Brother," "Under the Hot Sun," "Healed in Kandahar," and "Criminals and Justified" at the Tajik film studio.

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The film "Stadium in the Sky," based on his storyline, was produced in 1999 on the 20th anniversary of the tragic death of the Pakhtakor football team in an aircraft accident. The lyrics for the film were written by Alexander Feinberg in 1979.

In addition to this, A. A. Feinberg also managed the seminar of young Uzbek authors in Tashkent for several years. He is particularly friendly to creative youngsters, and his efforts have supplied encouragement to many early authors.

Murod Muhammad Dost, a writer and scriptwriter, and Jahongir Kasimov, a cinematographer, say about Alexander Feinberg's filmography: "It is imperative to strive to be a controller of artistic reality. He used to be like that, but today just a few people are like that. "

"The Giant and the Short was my first full-length film, we have appreciated working on this project because the topic's applicability, eternity, and profundity have greatly contributed to an uninhibited great sense of humor. It also provides a tremendous source of inspiration for its creators. "And all this will pass away," the master said, almost like Solomon. When instructing his colleagues, followers, and students, the poet did not demand knowledge, literacy, philology, or other trickery" Kasimov said.

Our country appreciates the poet, and the author's poetry nights were constantly filled with people. The poet's work is extensive and multifaceted. His poetry is vivacious, with such a wide range of topics, philosophy, complexity, and is found to be predictive. The poet is moved by the phrase, and the readers are captivated by it as well. In Uzbekistan, he lived and worked. The poet values the air, the sky, the soil, the people, in short, the whole being of this nation as precious as a poem, as beloved as his heart. It may be recognized in the poet's lines and creations, and its scent touches our breath.

CONCLUSION

No action goes unmentioned in our world: just as a wicked person is punished, a decent person gets the rewards of his or her good acts. Feinberg's contributions to Russian and Uzbek literature, in particular, did not go unnoticed. During the writer's lifetime, his efforts bore fruit. Despite the fact that the writer died 12 years ago, his work continues to bear fruit.

Alexander Feinberg was awarded the title of Honored Worker of Culture by the Republic of Uzbekistan on August 25, 1999, in acknowledgment of many years of productive work, a considerable contribution to the development of literature, and constructive participation in public affairs. On August 23, 2004, Alexander was awarded the People's Poet of the Republic of Uzbekistan. It is no secret that this title strengthens the Motherland's independence, raises our country's international prestige, contributes significantly to our people's culture and spirituality, earns national respect, demonstrates exceptional talent, multifaceted creativity, scientific activity, and science, many years of effective work in education, literature, culture, arts, health, sports, and other social spheres, and is a high title. Of course, the poet was well-deserving of the honor.

Alexander Arkadevich Feinberg, the People's Poet of Uzbekistan, was given the Pushkin Medal in 2008 by Presidential Decree. Alexander Feinberg, an Uzbek cinematographer and member of the Writers' Union of Uzbekistan, made a significant contribution to the establishment of cultural links between Russia and Uzbekistan. On April 2, 2009, he received the Pushkin Medal for his contributions to literature at the Uzbek State Academic Russian Drama Theater (by President of the Russian Federation Dmitry Medvedev's decree). We should not confuse this medal with the "A. S. Pushkin Medal," which was created in 1977 by the USSR Ministry of Education. This medal was the highest honorary award in the field of Russian language research areas. The award is presented each year to no more than ten people who have made substantial contributions to the study and development of the Russian language and culture, including Russian literature, art, and other subjects. The medal is awarded by the International Association of Teachers of Russian Language and Literature's national organizations.

I have enough hope. And the grave isn't the end of the path, as Alexander Feinberg points out. His statement was reasonably reliable. The poet's life did not stop after his death. For example, a statue of the People's Poet of Uzbekistan, Alexander Feinberg, was erected by sculptor M. Borodina in the Botkinsky Cemetery No. 1 in Tashkent.

On November 2, 2019, the People's Poet of Uzbekistan, Alexander Feinberg, would have turned eighty years old. On the same day, the Alisher Navoi National Library of Uzbekistan sponsored an event dedicated to the memory of Uzbek People's Poet Alexander Feinberg. A memorial plaque was erected in the house where the poet lived (Tashkent, Great Silk Road, 8). Relatives and friends of the poet, as well as students, gathered for the ceremony. The students of the 50th school, where A. Feinberg studied, amazed the audience so much that many even shed tears when they read the poem. People stood up and applauded. The wife of Feinberg, Inna Koval, was a small lady with a slight bend in her body, but the strength of her voice and the clarity of her ideas astounded everyone. He was handed an apple basket, but he insisted on everyone tasting it: "Please, help yourself." Koval, like her husband, was compassionate, forceful, generous, and open-handed.

A solemn ceremony was conducted at the Academic Russian Drama Theater on the same day. The audience was shown a movie by Jasur Is'hakov in which the poet was seen and heard. The producer gave a brief overview of the documentary's production, which was taken in one breath. The poet's acquaintances spoke out. The poetry of Alexander Feinberg was translated into Russian and Uzbek, and songs based on them were sung.

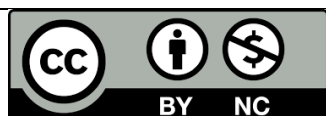
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Elena Vetvikova has released a photo of a special event dedicated to the 80th anniversary of the People's Poet of Uzbekistan, Alexander Feinberg, at the Academic Russian Drama Theater of Uzbekistan.

A new project has been developed to create a unified literary and architectural ensemble in the Alley of Writers in 2020. At the moment, it is planned to erect a statue of 23 writers in the park. These are: Alisher Navoi, Zahiriddin Muhammad Babur, Ogahi, Muqimi, Furqat, Abdulla Avloni, Mahmudhoja Behbudi, Abdulla Qodiri, Cholpon, Oybek, Hamid Olimjon and Zulfiya, Abdulla Qahhor, Said Ahmad and Saida Zunnunova, Gafur G'ulom, Ozod Sharafiddinov, Erkin Vahidov, Abdulla Oripov, Ibrahim Yusupov, Tolepbergen Kayipbergenov, Alexander Feinberg and Muhammad Yusuf are a whole ensemble. All in all, it is obvious that the presence of a statue of Alexander Arkadievich Feinberg in the Alley of Writers is one of the boundless respects of the Uzbek people for the writer and his work.

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The Effect of Categorizing a Continuous Independent Variable on Explained Variance



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Abstract: Researchers, Particularly those in behavioral sciences, often categorize a continuous independent variable, in their research work. This is done for the main purpose of applying analysis of variance in testing their hypotheses. Such categorization is accompanied by loss of information which is reflected in a change in proportion of the variance in the dependent variable, accounted for, by the independent variable. To provide an empirical backing to this claim, a validated “teachers variables and the attainment of the goals of the Universal basic education scheme”, was administered on a random sample of 640 secondary school teachers in Ogoja Education zone of Cross River State, Nigeria. The resulting data were analyzed using simple and multiple linear regressions. The independent variables were then categorized using sample mean and standard deviation. Analysis of variance was then applied. The proportion of the variance accounted for by the independent variables, individually and collectively were then compared using Fishers Z-transformation test. The results show that differences in explained variances do exist in favour of linear regression analysis, though not significant. The implication of the findings in research design is discussed.

KEY WORDS: Continuous Variable, Categorization, Explained Variance, Analysis of Variance, Factorial Design, Regression Analysis

INTRODUCTION

Analysis of variance (ANOVA) and regression analysis are two data analysis techniques that are very similar. This similarity arises from the fact that a regression model can be fitted into purely experimental data. Appealing as this may be, there are differences in the validating conditions, also called assumptions. These differences show-up in the results and decisions that are taken or that emanate therefrom.

Aczel and Sounderpandian (2006) and Anderson, Sweeney and Williams (1991) among others, stated that for analysis of variance to be validly Applied the dependent or response variable should be normally distributed in its population; the variance of the dependent variable should be the same for all sub-groups and that each of the sub-group must have been selected randomly and independently. In the ANOVA process, two independent estimates of the population variance, σ^2 are obtained. One estimate of σ^2 is obtained based on the differences between the treatment means (\bar{x}_i) and the overall sample mean (μ). The other estimate of σ^2 is obtained based on the differences of observed values of the dependent variable within each treatment, from the corresponding treatment mean. The two estimates are then compared to determine whether the treatments means, assumed to have come from different population, are equal or not.

For regression analysis, the basic assumptions are: the error term in the regression model is a random variable whose mean is zero; the variance of the error term is the same for all values of the independent variable; the value of the error term for a given value of the independent variable is not related, in any form, to the value of the same error term for another value of the independent variable; the error term is a normally distributed random variable.

The similarities in assumptions are visible except one-the requirement that the mean of the error term is zero. All the others are equivalent. For example that the error term is a random variable whose distribution is normal is equivalent to the assumption that the dependent variable should be normally distributed in its population. This holds because the dependent variable is a linear function of the error term. So that if the error term is normally distributed, then the variable from which the error term was obtained, is equally normally distributed.

The Effect of Categorizing a Continuous Independent Variable on Explained Variance

Kerlinger and Pedhazur (1973) observed that researchers especially those in the behavioral sciences, are in the habit of categorizing a continuous independent variable for the purpose of using either independent sample t-test or analysis of variance. Although it may be valuable to conceptualize research design issues in this way, they maintained that it is quite inappropriate to analyze them that way. So such procedures and approaches throw away useful information.

Kemeny, Snell and Thompson (1966) observed that when one dichotomizes a continuous variable that can take a range of numerical values, one loses considerable variance. This can be extended to a situation where the continuous independent variable is partitioned into three or more categories, whether using the observed mean and standard deviation, theoretical mean and standard deviation inter-person correlation or factor analysis (Uyanah, 2014). This may mean that inter-variable correlations are lowered to a level of non-significance, when in actual fact; the tested relationships may be significant (Kerlinger & Pedhazur, 1973). Those who adopt this approach, very often force the analysis of their research data on the procrustean bed of the elegance of the preferred method.

It should be noted that when a continuous independent variable is partitioned, the partitions are subsets of sets that are disjoint or mutually exclusive and exhaustive. The separate partitions have no quantitative meaning except that of qualitative difference. Moreover, the numbers assigned to these partitions are really labels that do not have numerical meaning. The level or scale of measurement has been reduced to nominal level, so that they cannot be ordered, added or subtracted, strictly speaking (Kerlinger & Pedhazur, 1973).

Regression analysis theoretically is and remains superior compared to analysis of variance in situations where:

1. The independent variable is continuously measured
2. There are two or more independent variables that are mixtures of both continuous and categorical
3. When the number of observations per cell are both unequal and disproportionate
4. When studying trends in a dependent variable, whether linear, quadratic, cubic etc.

According to Kerlinger & Pedhazur (1973), this list is only illustrative and not exhaustive. They argued that analysis of variance in such situations should be a stepping stone towards a conclusion that there exists a linear relationship. This, they continued, can be done by carrying out both regression analysis and analysis of variance, and testing the departure from linearity for significant. If there is departure from linearity, the between treatments sum of squares will always be larger than the sum of squares due to regression. This is where the superiority of regression analysis is, because further analysis can be done by fitting a polynomial regression model that may explain a higher amount of the variation in the dependent variable. If the regression sum of squares is higher than the between treatments means sum of squares, then the regression analysis is most appropriate.

This extent is traditionally not reached by researchers. Some do not even believe or are aware that regression in some or all situations is superior to ANOVA. Even those who believe, do so intuitively. They are some situations where high ranking academics, supervising post graduate students insist that, a continuous independent variable should be categorized and ANOVA applied. This makes the provision of empirical evidence imperative. This is what this study sought to do-to compare the proportion of the variance in the dependent variable accounted for by the independent variable when it is categorized and ANOVA applied, with the sum of squares that are obtained from regression analysis.

METHODOLOGY

Ex-post-factor research design was adopted for the study, because the independent variables were not manipulated. The variables had already interacted and produced their effect now observed as UBE goal attainment. A 47-item instrument tagged "Teachers Variables and UBE goal attainment questionnaire" was used for the study.

The instrument was previously developed and validated by Unwanede (2016). It was designed to measure four teachers' variables-perceived remuneration, capacity building, teacher-principal relationship and teacher-learner relationship (eight items each) with UBE goal attainment (15 items). All the items were built on a four (4) point modified Likert scale. The Cronbach alpha reliability estimates for the five substances are presented in Table 1.

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Table 1. Cronbach Alpha reliability estimate for the five (5) sub-scales (variables)

Name of sub-scale	No. of items	of mean	Std. dev.	Std. error	Sum of item var.	of Cronbach Alpha
Trs. Remuneration	8	17.353	5.700	.225	9.680	.802*
Trs. Capacity building	8	20.698	4.042	.715	8.446	.681*
Prin.-Trs. Relationship	8	23.025	3.726	.186	7.119	.778*
Trs.-learners relationship	8	22.252	4.145	.147	7.802	.690*
UBE goal attainment	15	38.168	6.906	.297	12.450	.810*

The results in Table 1 show that all the reliability coefficients are significantly higher than the .500 recommended by Nunnally (1978). The instrument was therefore considered useable.

The instrument was administered on a random sample of 640 secondary school teachers in Ogoja Educational Zone of Cross River State, Nigeria. Their responses were weighted as follows: 4 for Strongly Agree (SA), 3 for Agree (A), 2 for Disagree (D) and one (1) for Strongly Disagree (SD); for positively worded statements and reversed for negatively worded items. These weights were added for each variable per respondent. The independent variables were categorized into three partitions identified as high ($x > \bar{x} + s$) moderate ($\bar{x} - s \leq x \leq \bar{x} + s$) and low ($x < \bar{x} - s$). Simple and multiple linear regression analyzes were used to analyze for the individual and collective influence of the independent variable(s) on UBE goal attainment.

The analyses were repeated using one-way and four-ways ANOVA. The proportion of the total variance in the dependent variable accounted for by the independent variables were obtained and correspondingly compared, using Fishers' Z-transformation method. Decisions about the significance of the results were taken by comparing the P-values associated with the computed test statistics to the chosen level of significance (.05). So that results were said to be significant if the observed P-value was less than .05 and not significant if the P-value was greater than .05.

RESULTS

The descriptive statistics, mean standard deviation, standard error, minimum and maximum- of the five research variables are presented in Table 2.

Table 2. Descriptive statistics of the five research variables

Name of research variable	mean	Std. dev.	Std. error	Mini mum	Maxi mum
Trs. Remuneration	17.335	5.695	.225	8	32
Trs. Capacity building	20.998	4.429	.175	9	32
Prin.-trs. Relationship	23.502	4.722	.187	8	32
Trs.-learners relationship	23.225	4.415	.174	9	32
UBE goal attainment	39.816	7.069	.279	16	60

N=640

The results in Table 2 show that only the mean perceived teacher's remuneration ($\bar{x} = 17.353$) is less than the expected mean of ($\mu = 20.00$). All the other mean values are greater. These differences were not tested because it fell outside the scope of this study.

The results of simple and multiple linear regression analysis as well as the corresponding one-way and four-ways ANOVA, are presented in Table 3

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Table 3. Linear regression and ANOVA for the influence of teacher's variables on UBE goal attainment

Teachers' variable	Nature of variance	Linear regression	Analysis of variance
Teacher Remuneration	Explained	235.290	182.917
	Error	31746.988	31799.361
	Total	31982.278	31982.361
		a=39.101 b=.041 R=.086, R ² =.007	R= .077 R ² = .006
	Remark	Not significant	Not significant
Teachers' Capacity building	Explained	2890.271	1610.762
	Error	29173.007	30371.516
	Total	31982.278	31982.278
		a=35.587, b=.201 R=.296, R ² =.088	R = .224 R ² = .053
	Remark	Significant	Significant
Principal-teacher's Relationship	Explained	1494.611	383.416
	Error	30487.667	31598.862
	Total	31982.278	31982.278
		a=32.210, b=.324 R=.216, R ² =.047	R= .110 R ² = .012
	Remark	Significant	Significant
Teacher's-learners relationship	Explained	2717.920	1559.443
	Error	29264.358	30422.855
	Total	31982.278	31982.278
		a=28.977, b=.467 R=.292, R ² =.085	R= .221 R ² = .049
	Remark	Significant	Significant
All four variable together	Explained	3461.864	10557.227
	Error	28520.414	21425.051
	Total	31982.278	31982.278
		R= .329 R ² = .108	R= .574 R ² = .330
	Remark	Significant	Significant

The results in Table 3 reveal that for the influence of teachers' remuneration, capacity building, teacher-principals' relationship and teacher-learners' relationship, taken individually, the decisions taken using regression analysis results were the same with the decisions taken using ANOVA results. Even when all the independent variables were taken, the decision taken using the multiple regression results was the same with those using univariate ANOVA.

In-terms of the proportion of the total variance accounted for (R²) the values from regression analysis were higher than those from ANOVA when the independent variables were considered individually. The results specifically show that for perceived teachers' remuneration, regression approach accounted for .7% of the total variance while ANOVA approach accounted for .6%. For perceived teachers' capacity building, regression approach explained 8.8% of the total variance while ANOVA explained 5.3%. In the case of principal-teachers' relationship, regression analysis explained 4.7% while ANOVA approach explained only 1.2%. When the influence of teachers-learners relationship was analyzed for, the regression approach explained 8.5% of the total variance while ANOVA

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approach accounted for 4.9% only. When they were taken collectively, the ANOVA R^2 (33.0%) was higher than that from multiple linear regression analysis (10.8%).

To test for the significance of these differences in R-squared, the values were converted to R by taking square root. The Fishers' Z-transformation test was then applied. The results are presented in Table 4.

Table 4. Fisher's Z-transformation comparison of proportion of variance explained by ANOVA and linear regression analysis

Independent variable	Linear regression (R_1)	ANOVA (R_2)	Z of (R_1)	Z of (R_2)	Z
Trs. Remuneration	.086	.077	.090	.075	.268
Trs. Capacity building	.296	.224	.310	.229	1.446
Prin.-trs. Relationship	.216	.110	.218	.110	1.957
Trs.-learners relationship	.292	.221	.304	.224	1.450
UBE goal attainment	.329	.574	.343	.655	56.549*

***significant at .05 level. Critical Z= ± 1.96**

From Table 4, only the difference in R-squared between multiple regression and univariate ANOVA was significant ($Z=56.549$, Critical $Z=1.96$, $\alpha = .05$). All the other comparisons were not significant because all the observed z-values (.268, 1.446, 1.957, & 1.450) are less than the critical z-value (1.96).

DISCUSSION

The results that regression analysis is superior to ANOVA when the independent variable is continuous, is very interesting. Though the differences in the proportion of variance accounted for by the independent variable were not significant, they are however a pointer to the fact that there exist probabilities that at some point the differences may become significant. These results agree with the position taken by Kerlinger and Pedhazur (1973) that when a continuous independent variable is partitioned for the purpose of using either independent t-test or analysis of variance, some amount of variance is lost.

As it stands and with respect to the simple linear regression compared with one-way ANOVA, the conclusion is that the linear regression model fits the data more than the ANOVA model. This follows from position of Kerlinger and Pedhazur (1973) that when the between groups or treatment sum of squares is larger than the regression sum of squares, there may be significant departure from linearity. Now that the reverse is the case, it follows that linearity is the most appropriate.

The results that show that when all the four variables were partitioned and four-way ANOVA applied, the between groups sum of squares is larger than the multiple regression sum of square is interesting also. It should be noted that this does not mean that the ANOVA approach is superior. It shows that there seem to be a significant departure from linearity. If the study must be taken to a logical conclusion, then non-linear components of the regression must be added. The end-point may be the point where $SS_{reg} \geq SS_{between\ groups}$.

These results clearly show that it is inappropriate to partition a continuous independent variable, apply ANOVA and stop there. The best decision is to go straight to regression analysis or use the ANOVA approach only as a step towards obtaining the most adequate regression model.

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Experimental Study of Static-Dynamic Stretching and Muscle Strength and Its Effect on the Flexibility of Athletes in Gymnastics



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ABSTRACT: The research objectives were to analyze: the effectiveness of static and dynamic stretching exercises for increasing flexibility; the effect of high and low muscle strength abilities on the flexibility of gymnastics athletes; and the interaction of the two types of exercise to increase flexibility in terms of muscle strength. The research method is a 2 x 2 factorial design experiment. The treatment is carried out for 18 times with 2 sets x 30s x 13 exercises, tr.ti: 90s: 2-3 minutes. The population as well as the sample, namely the rhythmic gymnastics athletes of Surakarta City, amounted to 20 people. The instruments used are back dynamometer and sit and reach. Two way ANOVA data analysis technique. The results showed that static stretching exercises had a better effect than dynamic stretching on flexibility in gymnastics athletes. Athletes with high muscle strength abilities were better than low muscle strength athletes with respect to flexibility. Static stretching is suitable for athletes with high muscle strength and dynamic stretching with low strength abilities.

KEYWORDS: Static Stretching, Dynamic, Back Muscle Strength, Flexibility.

INTRODUCTION

One of the gymnastic groups is rhythmic gymnastics. Rhythmic gymnastics is defined as the perfect combination of sport and art by the National Australian Governing Body (Zaccagni et al., 2019). Rhythmic gymnastics is the only gymnastics specifically for female athletes that combines aspects of flexibility, endurance, strength, speed, accuracy, and beauty that are displayed in the form of freehand choreographies (without tools) or with tools (balls, hoops, ropes, ribbons, etc.) and mace) accompanied by music (Soenyoto, 2014).

The problem that attracts attention occurs in the Surakarta City Rhythmic Gymnastics Club, which has a declining performance. In the first championship, namely the 2018 SD O2SN, they managed to get third place, the next championship, namely the 2018 Provincial Championship (Kejurprov) managed to get the first place for the hoop tool, the second place for the mace and the third place for the versatile tool. The next Provincial Popda Championship in 2019 managed to get first place for rope tools and second place for rope tools, the championship which decreased drastically was the 2019 Provincial Championship (Kejurprov) only getting third place. The results of observations in August 2020 at the Surakarta City Persani Gymnastics Club found that, (1) the performance of rhythmic gymnastics athletes in Surakarta tends to decrease resulting in a decrease in achievement from the first championship to the last championship. (2) Surakarta City rhythmic gymnastics athletes have poor muscle strength because they are not stable when using the circuit/choreo apparatus in each exercise. The average muscle strength of the Surakarta City rhythmic gymnastics athletes is 56.30 kg which is in the less category. (3) Surakarta City rhythmic gymnastics athletes have poor flexibility.

The importance of flexibility in rhythmic gymnastics is revealed Santos et al., (2015) that muscle flexibility in rhythmic gymnastics is the main component that must be possessed. clarified Das et al., (2018) that flexibility is very important for gymnasts, because basically the majority of talented athletes are impossible to achieve maximum performance if they are gymnast is not flexible enough. Maximum exercise performance can be produced if you have good flexibility. Other opinion according to Sleeper et al., (2012) that speed, strength, endurance, agility, flexibility, balance are all physical abilities that play a role in the success of a competitive gymnast and are related to the ability to maintain injury-free participation in gymnastics.

It should be noted that choosing a training method to help smooth the training process is very strategic for a trainer so that training material can be conveyed in the field. This is so that the training process is more interesting and fun, so that the training

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objectives can be achieved. Stretching exercises are considered to be important effectors of joint flexibility. Stretching exercises add biomechanical precision to the athlete's movement while offering the opportunity to perform at maximum force throughout the entire range of motion (Alipasali et al., 2019). Static and dynamic stretching exercises are two stretching techniques that are generally recommended to improve flexibility (Yamauchi et al., 2016).

Stretching will improve neuromuscular function and can also cause post-activation potentiation, which is a temporary increase in muscle work resulting from previous contractions. Improved performance through this results in more cross-bridges being formed leading to increased muscle strength production (Behm & Chaouachi, 2011). When following dynamic stretching exercises new muscle fibers are produced, with parallel sarcomere formations. It should be noted, however, that the increased flexibility associated with muscle lengthening has an additional effect on muscle performance (Medeiros & Lima, 2017).

So far, stretching is only used as a prefix to improve the condition of the body before training, but stretching if the right dose can increase the flexibility of athletes. There is no real evidence that stretching before exercise automatically increases the risk of injury. Over the past decade, recent recommendations have evolved, emphasizing the practice of dynamic stretching over static stretching. In addition, research that proves the suitability of static and dynamic stretching exercise models to be given to athletes in terms of muscle strength has never been done.

Several studies examining the effect of stretching on flexibility report conflicting results (Dalrymple et al., 2010); (Amiri-Khorasani et al., 2011). Studies conducted Dalrymple et al., (2010); Morrin & Redding (2013) found that static stretching exercises had a greater improvement than dynamic stretching exercises on dancers' flexibility. Other studies by Blazeovich et al., (2018); Reid et al., (2018); Micheo et al., (2012); Chaabene et al., (2019) recommends that short-duration static stretching be included as a warm-up component prior to the use of sporting activities has a positive effect on flexibility and prevention of musculotendinous injury, and may increase joint range of motion (ROM). (Behm et al., 2016). These results recommend static stretching exercises rather than dynamic stretching for flexibility.

Different results in studies (Amiri-Khorasani et al., 2011) reported that professional soccer players performed better after dynamic stretching exercises. Chatzopoulos et al., (2019) reported that dynamic stretching was significantly better in increasing flexibility and movement time than static stretching. Dynamic stretching five times per week for a total of 4 weeks appears to increase running time as a result of dynamic muscle lengthening and improved coordination, and to reuse of stretching energy. (Behm et al., 2016), dynamic stretching for 8 weeks can not only improve flexibility but also jump power measurement (Turkey-Belkhiria et al., 2014), two sets of dynamic stretches have shown a similarly significant increase in 20-m . running speed (Turkey et al., 2012).

One that affects flexibility is the quality of the muscles in this case strength. It is as in opinion Budiwanto, (2012) states the factors that affect joint flexibility, namely muscle strength. Strong muscles will make daily muscle work efficient and will make your body shape better (Agusrianto & Rantesigi, 2020).

It seems that contradictory and constantly changing reports regarding research into the effectiveness of dynamic or static stretching can cause confusion, especially with trainers. More research is needed to determine whether dynamic or static stretching is more appropriate for increasing flexibility. Both types of stretching exercises have their advantages and disadvantages. Therefore, the aim of this review is to further examine its impact on athlete flexibility in relation to muscle strength.

METHODS

The research method used is a two x two factorial design experiment. The time for the research was two months, starting from December 9, 2020 to January 22, 2021. The population and also the sample involved were the rhythmic gymnastics athletes of Surakarta City, totaling 38 athletes. Sampling technique is based on theory (Miller, 2008), which is determined by 27% of the upper group and 27% of the lower group from the test results. Based on this, 20 athletes were obtained. The sample selection was based on these criteria so that there was a fairly high gap between the high and low power groups, while the medium group was not trained to use the applied treatment.

Then from each of the data divided into two groups by means of ordinal pairing and obtained each 5 athletes with high muscle strength were treated with static and dynamic stretching exercises, the same was also done for group of athletes who have low muscle strength. Sample grouping in Table 1:

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Table 1. Sample Grouping

Muscle Strength (B)	Stretching Exercises (A)	
	Static (A1)	Dynamic (A2)
Height (B1)	5 athletes	5 athletes
Low (B2)	5 athletes	5 athletes

The research process was carried out for 18 treatments. Training is carried out 3 times a week regularly for 6 weeks. The treatment for static and dynamic stretching groups is 2 x 30s x 13 exercises, tr.ti: 90s: 2-3 minutes. The instrument used to measure the strength of the back muscles is the back dynamometer. This test has a validity coefficient of 0.85, while the reliability coefficient is 0.89 (Sepdanius et al., 2019). The instrument for measuring flexibility uses sit and reach, with a validity of 0.978 and a reliability of 0.989 (Sepdanius et al., 2019). Data analysis used two-way ANOVA, with assumption test, namely normality and homogeneity test. Next, analyze the Post Hoc p test. 5%.

RESEARCH RESULTS

The sample in this study was the Woodball Club in Bantul Regency which consisted of 3 clubs, namely Mustang Woodball Club, The descriptive statistics of the pretest and posttest flexibility are presented in full below:

Table 2. Overall Descriptive Statistics

Practice Group	Muscle Strength	Pretest	Posttest
Static Stretch	Height (A1B1)	18.04	22.28
	Low (A1B2)	17.90	20.32
Dynamic Stretch	Height (A2B1)	15.82	17.94
	Low (A2B2)	15.78	18.26

Based on Table 2, it shows that the flexibility of group A1B1 (athletes with high muscle strength in static stretching exercises) has an average pretest of 18.04 cm, increased after being given static stretching exercises at the time of posttest by 22.28 cm, group A2B1 (athletes with strength high muscle dynamic stretching exercise) the average pretest was 17.90 cm, increased after being given posttest dynamic stretching exercise was 20.32 cm, group A1B2 (athletes with low muscle strength static stretching exercise) the average pretest was 15.82 cm , increased after being given static stretching exercises at the posttest by 17.94 cm, the A2B2 group (athletes with low muscle strength in dynamic stretching exercises) the average pretest was 15.78 cm, increased after being given static stretching exercises at the posttest by 18,26 cm.

Normality test

Shapiro-Wilk was used to analyze the data normality test. A summary of the Shapiro-Wilk analysis is presented in full below:

Table 3. Normality test

Group	Significance
Initial Data Flexibility Group A1B1	0.539
Final Data Flexibility Group A1B1	0.823
Initial Data Flexibility Group A2B1	0.635
Final Data Flexibility Group A2B1	0.787
Initial Data Flexibility Group A1B2	0.515
Final Data Flexibility Group A1B2	0.982
Initial Data Flexibility Group A2B2	0.971
Final Data Flexibility Group A2B2	0.794

The results in Table 3 show the analysis of the results of the normality test of the flexibility pretest and posttest data from the static and dynamic stretching exercise groups, the Shapiro-Wilk coefficient is greater than 5%, so that the data for all groups are normally distributed.

Homogeneity Test

The homogeneity test was carried out using the Levene Test. The summary of the Levene Test test analysis is presented in full below:

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Table 4. Homogeneity Test

Group	Significance
Initial Data Flexibility- Final Data Flexibility	0.707

The results in Table 4, the calculation results obtained a significance value of 0.707 greater than 5%. Thus the population has the same variance or homogeneous.

Hypothesis Test Results

Hypothesis analysis to answer the research results is based on the interpretation of the results of a two-way ANOVA. Hypothesis analysis is presented in full below:

Table 5. ANOVA test

Source	F	Sig.	Description
Exercise Method	5.525	0.032	Significant
Muscle Strength	10,999	0.004	Significant
Exercise Method * Muscle Strength	12.318	0.003	Significant

Hypothesis 1 obtained a calculated F value of 5.525 and a significance of $0.032 < 5\%$, the basis shows H1 "Static stretching exercise has a significantly different effect than dynamic exercise on increasing flexibility", is accepted. Based on the results of the analysis, it turns out that the static stretching exercise method group got an average difference of 3.18 cm, better than the dynamic stretching exercise method group of 2.45 cm with a posttest average difference between the two static and dynamic stretching groups of 0.73 cm.

Hypothesis 2 obtained F count 10.999 and significance $0.004 < 5\%$, the basis shows H2 "The ability of athletes who have high and low muscle strength abilities has a significant difference in flexibility in gymnastics athletes", is accepted. Based on the results of the analysis, it turns out that athletes who have high muscle strength with an average difference of 3.33 cm are higher than athletes with low muscle strength of 2.30 cm, the difference in the posttest average of high muscle strength groups with low muscle strength is 1,03 cm.

Hypothesis 3 obtained a calculated F value of 12,318 and a significance of $0.003 < 5\%$, the basis shows H3 "Static stretching and dynamic stretching exercises have a significant interaction with high and low muscle strength in increasing flexibility in gymnastics athletes", accepted. The graph of the interaction test results between exercise (static and dynamic stretching) and high muscle strength and low muscle strength on flexibility is presented more fully in the following figure:

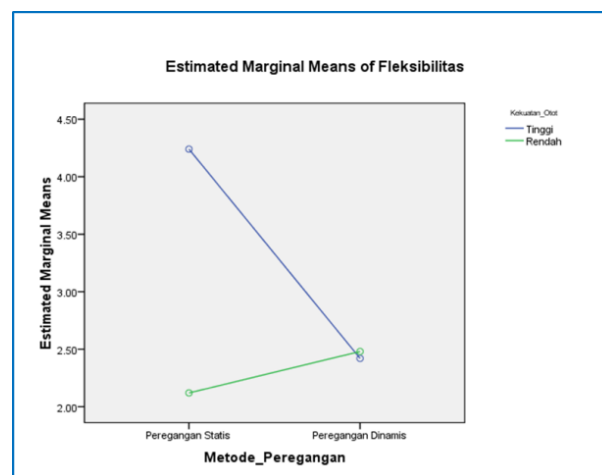


Figure 1. Interaction Result Graph

DISCUSSION

Hypothesis 1

Based on hypothesis testing, it is known that the static stretching exercise method and the dynamic stretching exercise method have a significant effect on flexibility in gymnastics athletes in Surakarta City. The results of the analysis prove that the static stretching exercise method is more significant in increasing flexibility than dynamic exercise. The results of studies comparing

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cyclic stretching (ballistic and dynamic) with static stretching (standard) varied. For example, Coons et al., (2017) reported that both dynamic ROM and static stretching significantly increased hamstring flexibility and that static stretching was twice as effective in increasing hamstring flexibility as dynamic ROM exercises. Improvements in muscle strength, jump height, and agility were found after dynamic stretching (Zhang et al., 2018). Dynamic stretching exercises in the form of kicks can improve the performance of the quadriceps and hamstring muscles in terms of average strength and are beneficial for athletes when performed before activity. (Freund et al., 2016). The combined use of static and dynamic stretching has the potential to improve standing balance (Takeda et al., 2020). Perrier et al., (2011) compared the effects of static and dynamic stretching on sitting flexibility and range and unlike this study found no difference in sitting scores and range between the static and dynamic treatments. Other studies Amiri-Khorasani et al., (2011), Perrier et al., (2011), Samukawa et al., (2011) have shown that dynamic stretching can produce equal or greater results in both dynamic and static ROM tests. Dynamic stretching improves repetitive sprint performance to a higher level than static stretching and no stretching (Zmijewski et al., 2020).

Different results in studies Mondam, (2017), Fjerstad et al., (2018) that static stretching exercises have a positive impact on joint range of motion, sensitivity of the Golgi tendon organs (Torres et al., 2012). The hamstring muscles have been shown to improve after dynamic stretching exercises (Sozbir et al., 2016). The advantages of static stretching exercises to increase static ROM are in accordance with a number of other studies. Increased joint range of motion (Werstein & Lund, 2012) and reduce muscle-tendon stiffness (Akagi & Takahashi, 2013) observed after static stretching exercise. Likewise, reductions in muscle strength, energy expenditure, and performance were associated with a person after performing static stretching exercises (Van Gelder & Bartz, 2011). In contrast, improvements in muscle strength, jump height, and agility were found after dynamic stretching exercises. Repeated muscle contractions during dynamic exercise increase muscle temperature, and this can decrease resistance, leading to increased muscle extensibility. On the other hand, acute improvement after static stretching is associated with increased tolerance to stretching or changes in the mechanical properties of muscle tendon units (i.e., reduced muscle stiffness). (Opplert & Babault, 2018). The evidence remains in favor of static stretching for long-term gains in flexibility.

Hypothesis 2

The results of the analysis prove that there is a significant difference between athletes who have high muscle strength and low muscle strength on flexibility in gymnastics athletes in Surakarta City. Athletes who have high muscle strength abilities are better than athletes with low muscle strength abilities. Decreased joint flexibility, influenced by age (Geremia et al., 2015), and also muscle strength (Sukadiyanto & Muluk, 2011).

Hypothesis 3

The results of the analysis prove that the static stretching exercise method is a more effective method to be trained on athletes with high muscle strength abilities, while dynamic stretching is suitable to be trained on athletes with low muscle strength abilities. Static stretching is a movement to stretch the muscles that is carried out slowly until tension occurs and achieves pain due to the pull of the stretched muscle. Static stretching affects nerve activation and produces acute changes in force production; it can also affect the sense of strength (Chatzopoulos et al., 2019). Based on this, athletes who have high muscle strength will be more suitable to do static stretching exercises.

CONCLUSIONS

It can be concluded that static stretching exercises have a better effect than dynamic stretching on flexibility in gymnastics athletes. Athletes with high muscle strength abilities were better than low muscle strength athletes with respect to flexibility. Static stretching is suitable for athletes with high muscle strength and dynamic stretching with low muscle strength abilities.

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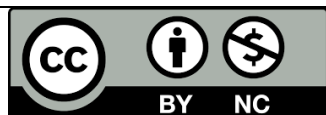
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Evaluation of Implementation of Adaptive Physical Education Learning During the Covid-19 Pandemic in SLB Yogyakarta City



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ABSTRACT: This study aims to determine the results of the evaluation of context, input, process, product implementation of adaptive physical education learning during the Covid-19 pandemic at Special Schools in Yogyakarta City. The results showed that the evaluation of the implementation of adaptive physical education learning during the Covid-19 pandemic at Special Schools in Yogyakarta City resulted in the poor category. Furthermore, each evaluation aspect is explained, namely. (1) The context of the evaluation of the implementation of adaptive physical education learning during the Covid-19 pandemic at Special Schools in Yogyakarta City was categorized as good. Indicators of learning materials and the formulation of objectives are 3.14 in the good category, organizing materials, media, and other learning resources are 2.78 in the good category, designing teaching and learning activities are 3.34 in the very good category, class management is 3.33 in the very good category, and an assessment of 3.35 in the very good category. (2) The input for the evaluation of the implementation of the evaluation of the implementation of adaptive physical education learning during the Covid-19 pandemic at Special Schools in Yogyakarta City was good. The indicator of the suitability of learning materials with KI KD is 3.29 in the good category and the characteristics of students are 2.41 in the less. (3) The process of evaluating the implementation of the evaluation of the implementation of adaptive physical education learning during the Covid-19 pandemic at Special Schools in Yogyakarta City resulted in the poor category. The learning activity indicator is 2.30 in the less category and the student activities are 1.86 in the less category. (4) Product evaluation of the evaluation program for the implementation of adaptive physical education learning during the Covid-19 pandemic at Special Schools in Yogyakarta City the results were in the less category. The indicator of achievement learning outcomes in Special Schools in Yogyakarta City is 1.83 in the less category.

KEYWORDS: Evaluation, Adaptive Physical Education, Covid-19 Pandemic

INTRODUCTION

The online learning tsunami has occurred almost all over the world during the Covid-19 pandemic (Goldschmidt, 2020: 3). Thousands of schools in other countries, including Indonesia, have closed schools in an effort to stop the spread of Covid-19. Teachers and educators as an important element in teaching are required to make an unprecedented massive migration from traditional face-to-face education to online education or distance education. One of the affected subjects is Physical Education, Sports and Health (PJOK). PJOK which leads to harmony between body growth and mental development and is an effort to make the Indonesian nation healthy and strong physically and mentally, is given to all types of schools (Mroczek et al., 2017: 3). With various limitations on internet access, and operational capabilities on online features, physical education naturally encounters various obstacles and obstacles during the Covid-19 pandemic. Physical activity is the main and dominant thing in PJOK learning. Based on observations in three special schools in Yogyakarta, namely SLB Negeri 2 Yogyakarta, SLB Helen Keller Indonesia, and SLB Bina Anak Sholeh in January 2021, it was found that there were students with special needs including mentally retarded children, children with physical disabilities, children with autism and slow learners, deaf children, mentally retarded children, and superiors. With the disturbances possessed by students with special needs, it shows that students have difficulty adjusting to regular students in receiving the learning provided by the teacher, especially physical education learning. The number is so minimal and the necessity to teach all grade levels certainly makes it difficult to provide physical education learning. Based on interviews with PJOK teachers, PJOK learning is still being carried out, but the teacher only gives assignments to perform movements or sports techniques, then students make videos and send them via cellphone to the teacher concerned. So far,

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PJOK teachers are also confused about choosing and utilizing technology or online learning platforms that can fulfill PJOK teaching.

As for other problems that often occur through self-concept or self-ability when students study online (E-learning) at home, namely (1) students cannot have their own learning initiative, so students wait for instructions or assignments from the teacher in learning. , (2) students are not accustomed to carrying out online learning needs at home, students learn the material according to what is given by the teacher, not what they need, (3) some students are still unable to monitor, regulate, and control online learning at home. home, still impressed to learn as necessary. Another problem that occurs is not only in the learning media system, but the availability of quotas that require a high enough cost for students and teachers to facilitate online learning needs. The quota purchased for internet needs has soared and many parents of students are not ready to increase the budget in providing internet networks. This is also a very important issue for students, what time should they study and what data (quota) they have, while parents who have low income or from the lower middle class (underprivileged). Until finally things like this are charged to parents of students who want their children to continue to follow online learning.

In addition to the technical constraints felt by students, the less than optimal service from the teaching staff is also an obstacle during online learning. Teachers who are accustomed to using conventional teaching styles such as lectures, group discussions and direct assignments in face-to-face learning, feel that the full online mechanism does not provide satisfaction in teaching (Fauzi & Khusuma, 2020; Hutauruk & Sidabutar, 2020; Rigianti, 2020). The results of Nurmaya's research (2021) found that the evaluation of the implementation of online learning included, the participation of students in participating in online learning, the applications used in online learning, the condition of the quality of the network during online learning, the quality of the material provided by the teacher during online learning, availability of discussion time between teachers and students during online learning. Another thing that the researchers found based on the opinion of the respondents for the implementation of learning in the next semester showed that they were less ready to face.

Furthermore, research conducted by Budiman (2021) found that the online learning mechanism has a positive impact in the form of student independence in learning, increased activity in finding learning resources and learning style innovation. The negative impact of online learning is in the form of boredom and decreased interest in learning due to the failure of students and teachers to overcome obstacles such as inadequate supporting facilities, lack of internet quota and poor internet signal. The challenges faced by students and teachers during online learning are the availability of supporting facilities, innovative learning strategies and synergies between educational components. Online learning has the opportunity to continue to be implemented with a blended learning system in order to create an effective and efficient digital learning ecosystem. Based on the description above, it is necessary to conduct an evaluation of online learning, the first is about the implementation of online learning, the second is to examine the impact of online learning policies, the evaluation of online learning has not been carried out comprehensively. Evaluation is a part that must exist in the implementation of learning activities in ensuring the objectives are in accordance with the standards. With the evaluation, it is hoped that the implementation of online learning will be known, the evaluation activities used include context, input, process, product (CIPP).

METHODS

This type of research is an evaluation research that uses mixed quantitative and qualitative methods. Sukmadinata (2017: 68) states that evaluative research is a research activity that evaluates an activity/program that aims to measure the success of an activity/program and determine the success of a program and whether it has been as expected. The population is a collection of units to be studied for its characteristics (characteristics). The entire subject or data source that is the center of attention of researchers is called the population (Budiwanto, 2017: 157). The subjects of this evaluation were the principal, PJOK teachers, and parents of students at SLB Yogyakarta City. The sampling technique in this study used purposive sampling. The sample criteria were: the researcher took 1 PJOK teacher with a minimum background of S1 Physical Education, 1 principal in each SLB in Yogyakarta, parents of students who were willing to be the sample and filled out the questionnaire from the researcher. Data collection techniques refer to a method, the form of which is shown in its use in collecting data using instruments. The research instrument according to Hardani, et al., (2020: 284) is "a measuring instrument used to obtain quantitative information about variations in the characteristics of variables objectively, so that a scale development technique or measuring instrument is needed to measure variables in more systematic data collection". The instruments used are observation sheets, questionnaires, interviews, and documentation.

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Table 1. CIPP Evaluation Instrument Grid

Variabel	Aspek	Responden	Teknik Pengumpulan Data
<i>Context</i>	Bahan pembelajaran dan rumusan tujuan	Guru	Angket
	Mengorganisasi materi, media dan sumber belajar lain	Kepala Sekolah	
	Merancang kegiatan belajar mengajar		
	Pengelolaan kelas		
	Penilaian		
<i>Input</i>	Kesesuaian Materi Pembelajaran dengan KI KD	Guru Kepala Sekolah	Angket Observasi
	Karakteristik peserta didik		Angket
<i>Process</i>	Kegiatan pembelajaran daring	Guru	Angket Observasi Dokumentasi
	Kegiatan peserta didik	Guru Orang tua	Angket Observasi
<i>Product</i>	Hasil Pembelajaran	Guru Orang tua	Dokumen Angket

The data analysis technique used is qualitative and quantitative. The success criteria that will be used in this research are:

Table 2. Success Criteria

No	Interval	Kriteria
1	3,26-4,00	Sangat Baik
2	2,51-3,25	Baik
4	1,76-2,50	Kurang
5	1,75-1,00	Sangat Kurang

RESEARCH RESULTS

1. Context Evaluation

The results of each indicator on the context component are described in Figure 1 as follows.

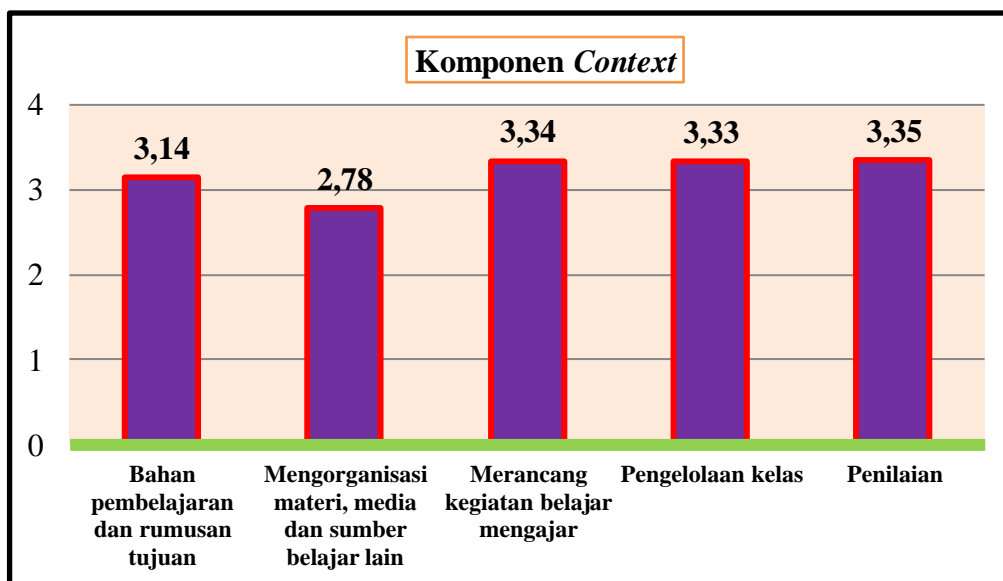


Figure 1. Evaluation Context Bar Diagram

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Based on Figure 1 above, it shows that the learning materials and the formulation of the objectives of the evaluation program for the implementation of adaptive physical education learning during the Covid-19 pandemic at Special Schools in Yogyakarta City on the indicators of learning materials and the formulation of objectives are 3.14 in the good category, organizing materials, media and resources. other learning is 2.78 in the good category, designing teaching and learning activities is 3.34 in the very good category, class management is 3.33 in the very good category, and the assessment is 3.35 in the very good category. Based on these results, it shows that the background of the evaluation program for the implementation of adaptive physical education learning during the Covid-19 pandemic at Special Schools in Yogyakarta City has been going well. Overall, it shows that the Contexts evaluation of the implementation of adaptive physical education learning during the Covid-19 pandemic at Special Schools in Yogyakarta City was 3.19 in the good category.

2. Input Evaluation

Input The evaluation of the implementation of adaptive physical education learning during the Covid-19 pandemic at Special Schools in Yogyakarta City is shown in Figure 2 as follows.

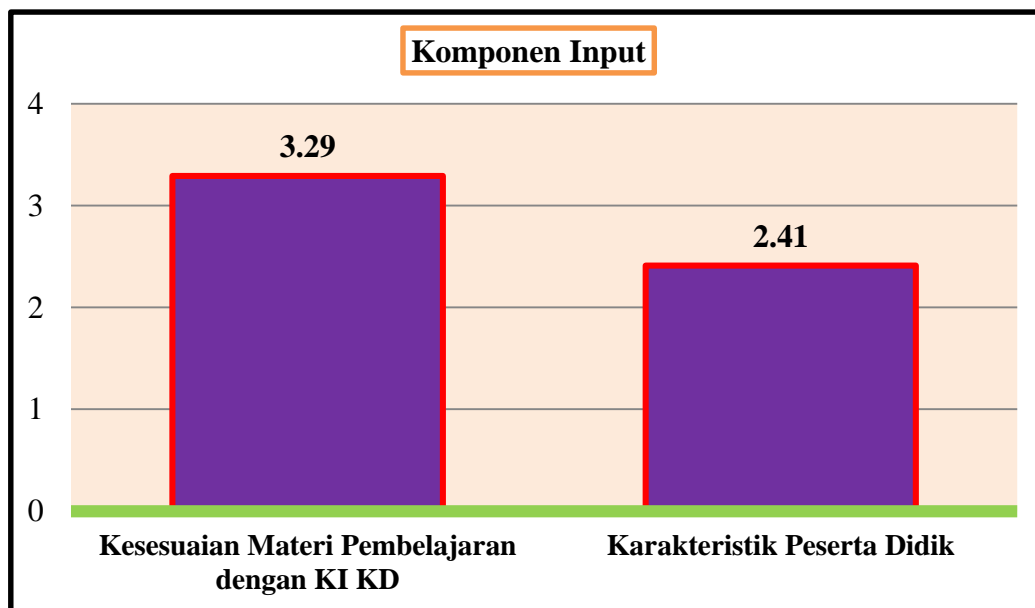


Figure 2. Evaluation Input Bar Chart

Based on Figure 2 above, it shows that the input for evaluating the implementation of adaptive physical education learning during the Covid-19 pandemic at Special Schools in Yogyakarta is 2.85 in the good category.

3. Process Evaluation

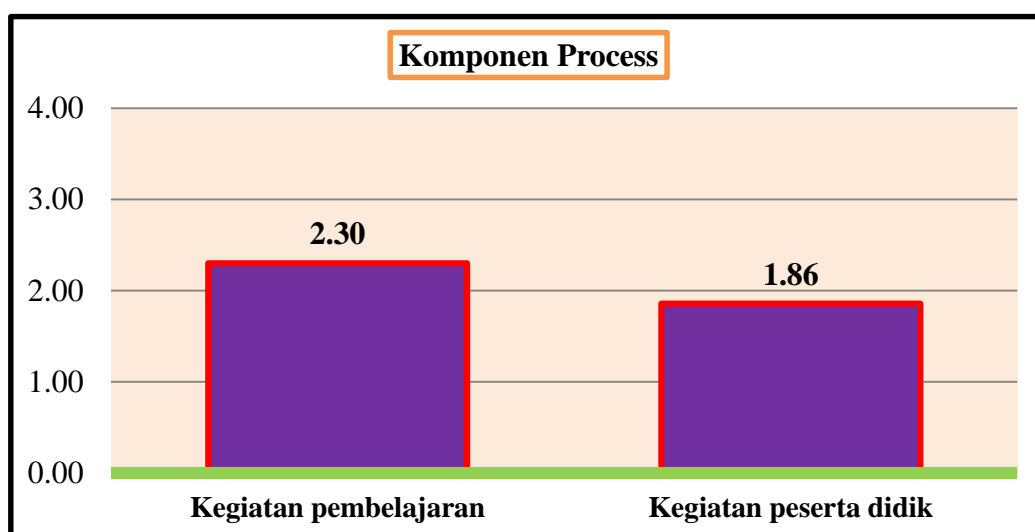


Figure 3. Evaluation Process

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Process The evaluation of the implementation of adaptive physical education learning during the Covid-19 pandemic at Special Schools in Yogyakarta City can be seen in Figure 3 as follows. Based on Figure 3 above, it shows that the process of evaluating the implementation of adaptive physical education learning during the Covid-19 pandemic at Special Schools in Yogyakarta City was 2.22 in the less category. The role of parents is very important in the implementation of learning at home during the Covid-19 pandemic, because parents are the first educators for children in family education, therefore, parents must always try their best to guide children when studying at home. The constraints that have been mentioned related to the lack of understanding of the material by parents can be overcome or minimized by deliberation between parents and teachers, so that teachers can provide other alternatives to parents. Inputs from teachers are very useful to overcome the difficulties experienced by parents.

4. Product Evaluation

Product The evaluation of the implementation of adaptive physical education learning during the Covid-19 pandemic at Special Schools in Yogyakarta City can be seen in Figure 4 as follows.

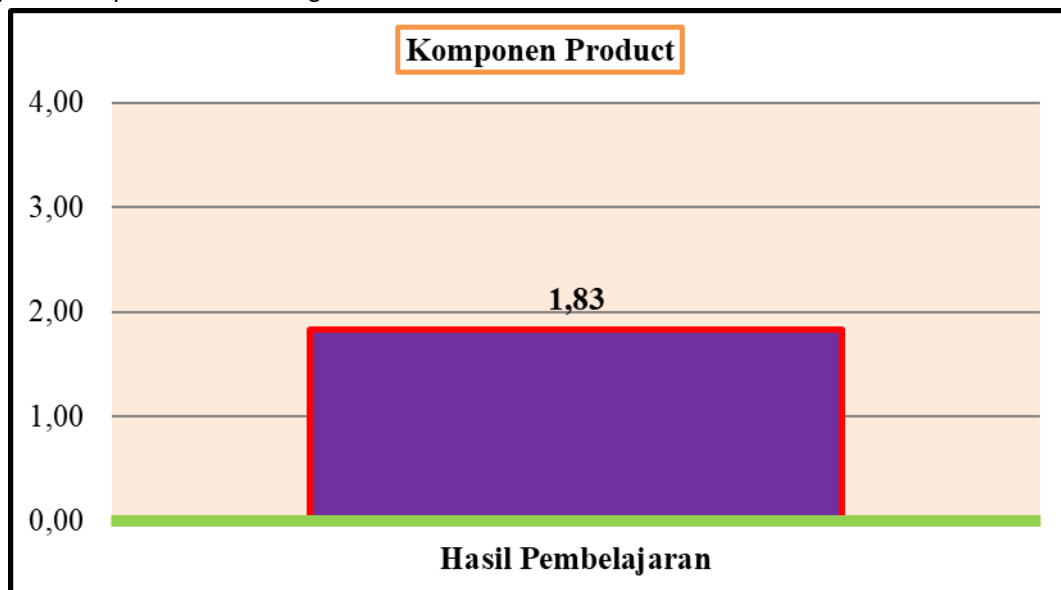


Figure 4. Product Evaluation Bar Chart

Based on Figure 7 above, it shows that the Product evaluation of the evaluation program for the implementation of adaptive physical education learning during the Covid-19 pandemic at Special Schools in Yogyakarta City was 1.83 in the less category.

DISCUSSION

Program evaluation is a systematic and subjective assessment of an object, program or policy that is currently running or has been completed, both in its implementation design and results, where the purpose of program evaluation is to determine the relevance and achievement of objectives, efficiency, effectiveness, impact and sustainability. where an evaluation must provide reliable and useful information to be able to take lessons for the decision-making process. Based on the results of the study, it showed that the evaluation of the implementation of the evaluation of the implementation of adaptive physical education learning during the Covid-19 pandemic at Special Schools in Yogyakarta City was in the poor category.

The lack of implementation of adaptive physical education learning during the Covid-19 pandemic at Special Schools in Yogyakarta City was due to several obstacles. The obstacles faced by parents in accompanying children to study at home during the Covid-19 pandemic as described, namely the lack of understanding of the material by parents, parents' difficulties in growing children's interest in learning, not having enough time to accompany children because they have to work, parents are impatient in accompanying children while studying at home, parents' difficulties in operating gadgets, and obstacles related to internet service coverage are highly expected in the future this will no longer be an obstacle in learning at home for children so that children are able to get optimal learning services ,

Activities that should be carried out at school by students such as interacting with their peers and also interacting with teachers are hampered due to school closures and are replaced with online learning. Interactions can only be carried out through the intermediary of online platforms. In addition to school, students' social skills can be built and carried out at home with their respective parents through interactions when parents and students work together to complete school assignments given by the teacher. However, this interaction will not occur if the parents of students are too busy with work.

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Strategies for parents to teach and build self-regulation, for children to develop behaviors that are released in order to have the ability to organize and plan their own learning process every day at home. Like discussing some rules in the house, giving directions to children about proper behavior. An example is for children to get guidance for achieving achievements, conveying uncomplicated ways to children to solve problems related to the ability to maintain interpersonal relationships with teachers and classmates while at home.

If the child shows emotional behavior, show how to deal with it and also explain the consequences of the behavior, be friends or friends in sharing tasks related to self-regulation. For example, as a friend thinks in completing tasks and becomes a friend to ask questions, and this must be a consistent process, preparing and showing real strategies to children in an effort to maintain their learning abilities. For example, preparing and scheduling children's learning activities in detail so that they are easy to follow, preparing instructions on how to study effectively. For example, giving the child a question and then asking the child to give a complete answer by reading the books at home.

The evaluation of the implementation of adaptive physical education learning during the Covid-19 pandemic at Special Schools in Yogyakarta City based on the components of context, input, process, and product results is explained as follows.

1. Context Component

Based on the results of the study, it was shown that the evaluation of the implementation of adaptive physical education learning during the Covid-19 pandemic at Special Schools in Yogyakarta City was good. Context evaluation is a description and specification of the program environment, unmet needs, population and sample characteristics of the individuals served and the objectives of the program itself. Context evaluation is primarily concerned with the type of intervention carried out within a particular programme. In other words, context evaluation is an evaluation of needs, the purpose of meeting needs, and the characteristics of individuals who handle (evaluators) (Gandomkar, 2018: 95; Umam & Saripah, 2018: 20; Young Lee, et al., 2019: 4; Al-Shanawani, 2019: 5).

The indicator of learning materials and the formulation of objectives is 3.14 in the good category. The teachers prepare lesson plans in accordance with the competency standards and core competencies contained in the guidelines. From the SK-KD, the sports teacher compiles indicators that are appropriate to the conditions of students with special needs, including in the selection of materials and learning principles that are adapted to students' conditions. This is also confirmed by research from Paradipta & Dewantoro (2019) which states that each type of disturbance or problem faced by ABK requires different services. Likewise, in adaptive physical education, each type of disorder requires its own form of physical education service. Therefore, ideally the adaptive physical education program is an individual service program.

The teacher's ability to formulate learning objectives is an ability/mastery of the teacher which includes the potential, knowledge, and skills possessed by the teacher in the formulation of the behavior or abilities that students want to achieve when the learning process is carried out. The expected capabilities must be formulated specifically and operationally, so that later they can be measured (value). According to Sudjana (Yanti, 2018: 2) learning planning is an activity of projecting what actions will be carried out in a learning, namely by coordinating (arranging and responding) the components of learning, so that the direction of the activity (goal), the content of the activity (material), how to delivery of activities (methods and techniques), as well as how to measure them (evaluation) becomes clear and systematic.

In the Regulation of the Minister of Education and Culture of the Republic of Indonesia Number 22 of 2016 concerning Guidelines for Preparation of RPP, it is stated that one of the components in the preparation of the Learning Implementation Plan (RPP) is the existence of learning objectives that are formulated based on KD, using operational verbs that can be observed and measured, which include attitudes, knowledge, and skills. One of the important things in the design process or learning design is to formulate learning objectives. Every teacher needs to understand and be skilled in formulating learning objectives, because the formulation of clear objectives can be used to evaluate the effectiveness of the success of the learning process. A learning process is said to be successful when students can achieve their goals optimally. The success of achieving goals is an indicator of the success of teachers in designing and implementing the learning process. Learning objectives can also be used as a guide and guide for student learning activities in carrying out learning activities. In this regard, the teacher can also plan and prepare what actions must be taken to help students learn.

The indicator of organizing materials, media, and other learning resources is 2.78 in the good category, designing teaching and learning activities is 3.34 in the very good category. The interaction between educators and students who discuss the material or teaching materials delivered is the basis of learning (Djedjen & Nuchiyah, 2015: 57). Huzaimah & Amelia (2021: 535) explain that online learning requires adequate facilities and infrastructure, such as laptops, computers, smartphones, and internet networks.

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The class management indicator is 3.33 in the very good category. Warsono (2016: 471) explains that classroom management is an effort carried out by the person in charge of teaching and learning activities with the aim of achieving optimal conditions, so that teaching and learning activities can be carried out as expected. Classroom management is concerned with efforts to create and maintain optimal conditions for the learning process to occur. Classroom management is an effort made by the person in charge of learning activities or helping to achieve satisfactory conditions in accordance with the expected goals. Classroom management is the skill of a teacher to create and maintain optimal learning conditions and restore the best possible conditions if problems occur.

The arrangement relates to the delivery of teaching messages (instructional), or it can also relate to the provision of learning conditions (class management). If setting conditions can be done optimally, then the learning process will take place optimally as well. But if it cannot be provided optimally, of course it will cause interference with teaching and learning. Effective classroom management is an absolute prerequisite for an effective teaching and learning process. Another thing that also determines the success of educators in managing the classroom is the ability of educators to prevent the emergence of student behavior that interferes with the course of teaching and learning activities as well as the physical condition of teaching and learning places and the ability of educators to manage (Pamela, et al., 2019: 25).

The efforts of educators in creating conditions that are expected to be effective if: first, it is precisely known the factors that can support the creation of favorable conditions in the teaching and learning process. Second, it is known for the problems that are expected and usually arise and can damage the teaching and learning climate. Third, mastery of various approaches in classroom management and also knowing when and for which problems an approach is used. Therefore the skill of the teacher to read the classroom situation is very important so that what is done is effective. By studying the basic concepts of classroom management, studying various management approaches and trying them out in teaching and learning situations.

The assessment indicator is 3.35 in the very good category. A good and careful assessment will provide an objective description of the process and output of learning outcomes. In this regard, Mardapi (in Jumaeda and Alam, 2020: 4) said that the assessment system used in educational institutions must be able to: (1) provide accurate information, (2) encourage students to learn, (3) motivate teaching educators, (4) improve the performance of institutions, and (5) improve the quality of education. Assessment by teachers can be seen in terms of planning, implementation and reporting of student learning outcomes. Assessment planning can be detected through the syllabus, learning implementation plans, and a grid of questions in the assessment used by the teacher. The implementation of the assessment can be seen from student documents and teacher assessment books.

Assessment is an important component in the process of achieving the desired learning outcomes. Assessment becomes a compass and a mirror for how students learn. Therefore, after planning and implementing the learning process, the teacher assessment instructor is aligned with the objectives, activities and assessment instruments (Fitzallen, et al., 2017: 19; Barattucci, 2017: 3; Guo, et al., 2017: 125; Alfauzan & Tarchouna, 2017: 82). Assessment provides information on the success of learning that has been designed and implemented. The assessment provides a reflection on the learning that has been carried out in the classroom (Yang et al., 2016: 241).

Teacher assessments can be summative and formative. Summative assessment is related to the time of the evaluation, which is at the end of the learning unit. while formative assessment aims to monitor student learning during the learning process and provide continuous feedback to help students improve their learning, including conducting evaluations using online assessments (Akimov & Malin, 2020: 1205; García-Peñalvo, et al., 2021: 88; Rohim, 2020: 2).

Online assessment is believed to be an effective and efficient evaluation method (Bull & McKenna, 2019: 23; Trendak, 2019: 49; Huda, et al., 2020: 251; Jalo, et al., 2021: 126). Students can adapt the test to their free time, and repeat it several times. Previous research has also shown that online assessments can enrich students' learning experiences by promoting active engagement, stimulating interaction with material content, themselves, and others, increasing student motivation, and encouraging students to be responsible. (Xiong & Suen, 2018: 242; Hsu, et al., 2021: 12; Jung & Lee, 2018: 11; Oluwajana, et al., 2021: 7; Deng, et al., 2019: 49).

2. Input Component

Based on the results of the study, it was shown that the evaluation of the program input for the evaluation of the implementation of adaptive physical education learning during the Covid-19 pandemic at Special Schools in Yogyakarta City was good. Haryanto (2020: 97); Gunung & Darma (2019: 34); Sopha & Nanni (2019: 1360) explain that input evaluation provides information about selected inputs, points of strength and weakness, strategies, and designs to realize goals. Santiyadnya (2021: 4) explains that its purpose is to help regulate decisions, determine what alternative sources will be taken, what plans and

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strategies are to achieve the needs, and what are the work procedures to achieve them. The input evaluation component itself consists of several, namely human resources, supporting facilities and equipment, funds or budget,

The main orientation of input evaluation is to assist a program approach in creating the necessary changes (Lipe & Carter, 2018: 10; Erdoan & Mede, 2021: 4; Rocha, et al., 2021: 6). Input evaluation is carried out to identify and assess the capability of material, equipment, human and cost resources to implement the selected program. To this end, evaluators seek and critically examine potential relevant approaches, including those already in use. The secondary orientation of input evaluation is to inform interested parties about the selected program approach, alternative approaches, and the reasons. Basically, the evaluation of inputs should involve identifying the relevant approaches and assisting decision makers in developing the chosen approach to implement.

The indicator of the suitability of learning materials with KI KD is 3.29 in the good category. Teachers are required to be innovative in using online learning models. This is in line with the opinion of Anugrahana (2020), that teachers only facilitate with class libraries, modules, textbooks, and supporting books, and most importantly internet access, as well as providing several computers for students who do not bring laptops. The form of e-learning (electronic-based learning) will still exist and continue to grow. As computer ownership is growing rapidly in the world, e-learning is becoming more and more developed and accessible. Internet connection speed is increasing, and with it, more opportunities for multimedia training methods are popping up.

The indicator of student characteristics is 2.41 at less. This is indicated by the lack of enthusiasm of students when learning online, participants do not understand online learning, there are students who are late in sending assignments from the teacher, students also feel bored with online learning because of the lack of interaction with their friends. These results are supported in the research of Bahasoan, et al., (2020); Suryaman, et al., (2020); Tratnik, et al., (2019); Jack, et al., (2018) that students are less enthusiastic in online learning. During the Covid-19 pandemic, online learning has been carried out in almost all corners of the world, but so far online learning has never been carried out simultaneously (Sun et al., 2020: 688).

In this online learning process, all elements of education are asked to be able to provide learning facilities so that they remain active even though it is done without face to face. Parents are required to be able to guide children to learn from home and be able to replace teachers at school, so the role of parents in achieving online learning goals and guiding children while studying at home is very important (Delgado-Gaitan, 2018: 86; Hargreaves & Fullan, 2020: 328; Epstein, 2019: 40).

3. Process Components

Based on the results of the study, it showed that the process of evaluating the implementation of adaptive physical education learning during the Covid-19 pandemic at Special Schools in Yogyakarta City resulted in the poor category. The indicator of learning activities is 2.30 in the less category. In the implementation of online or online learning, obstacles or discrepancies are often found with proper learning. Many assume that the teacher's responsibility in carrying out online learning is much lighter than face-to-face learning (Semradova & Hubackova, 2016: 11; Budi Lestari, et al., 2021: 3; Wahyuni, et al., 2021). Moreover, Syahfitri et al., (2020: 3) explained that online learning carried out by teachers is currently only limited to knowledge transfer activities. Students lack a deep understanding

Referring to factors in general, the obstacles to online learning involve many basic aspects which in essence are related to equity and readiness, such as supporting devices such as information media, the ability of teachers to study participants. Even though the implementation elements have been successfully fulfilled in terms of supporting aspects such as technology and networks, it will still be easier for urban areas where the level of facilities is adequate. Even if it goes on, there will always be gaps causing obstacles in the implementation process because the facts show that the problems of learning online systems are indeed quite complex where the impact is not only on teachers and students but also parents.

The indicator of student activity is 1.86 in the less category. Not all students and parents have gadgets to support online learning. Online learning that requires support for the use of technology is not without problems that will hinder the learning process. Carrying out online learning requires a gadget that supports where all participants and parents of students do not necessarily have gadgets. Even if parents of students have gadgets that support them, it is not necessarily that parents of students and students are able to access platforms that support the learning process, which platforms are still foreign because they have never been used. Most of the parents of students and students only know the Whatsapp application. This is because both parents and students do not follow technological developments. The learning process only uses Whatsapp to provide materials and assignments to students.

As stated by Lestari & Gunawan (2020: 59); Garaus (2018: 447); Alalwan, et al., (2018: 100) that another negative thing about internet services is that it allows them to affect the health of students. Another obstacle found was the ability of parents to

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provide online educational facilities such as the use of the internet network which requires no small amount of money (Zara, et al., 2020: 70; Lone, et al., 2020).

4. Product Components

Based on the results of the study, it was shown that the evaluation of the evaluation program for the implementation of adaptive physical education learning during the Covid-19 pandemic at Special Schools in Yogyakarta City was still lacking. The indicator of achievement learning outcomes in Special Schools in Yogyakarta City is 1.83 in the less category. Facts on the ground show that all students get the maximum score when given a question. This becomes a question for the teacher, whether students really understand the material or students get help from adults when doing assignments. Teachers cannot objectively assess learning achievement according to students' abilities. From the affective side, teachers also have difficulty in assessing. Usually, affective assessment occurs naturally when students interact, communicate, and socialize with friends.

The benchmark for the success of a learning depends on the achievement of the objectives of student learning competencies which include cognitive, affective, psychomotor competencies and the realization of the application of values both in thinking and acting. Ensuring that all students have mastery of competence in a teaching material to then proceed to the next material is the purpose of mastery learning. Mastery learning refers to the competencies achieved and is supported by indicators to measure the level of achievement. All aspects of mastery learning can only be achieved with collaboration and cooperation between the two parties, namely teachers and students.

Doing assignments that are done entirely at home makes students feel that the tasks given by the teacher are too many. It is different when learning is face-to-face in the classroom where the assignment is given into two, namely assignments given during learning in class and assignments given to be used as homework. Even though the tasks given to students are the same, not infrequently even less than when learning face-to-face in the classroom. Students also feel bored because during online learning students cannot socialize directly with their friends.

Online learning requires students to use gadgets to support the learning process. Such a situation and also supported by parents who pay less attention to the learning process of students so that giving personal gadgets to students can be used as a place to steal time to play online games instead of doing the assigned tasks. Online games make students procrastinate and lazy to do their work. Students who have been given personal gadgets by their parents tend to understand more about other things that can be done using gadgets.

For students who have a time limit on using gadgets when face-to-face learning changes to using gadgets every day. Online learning changes exams that should be carried out in normal conditions by students into only sending practical videos that students do. Even the exams that were supposed to be done could be cancelled. This online learning also has an impact on lessons that require a lot of practice during the learning process under normal conditions. The skills that should be mastered by students at the time of learning are not maximally accepted by students. The collection of assignments that are only in the form of videos or photos makes it difficult for teachers and fatigue when reviewing the results of assignments from students. Especially if there are students who do not collect the assignments given. The teacher cannot give a grade if this continues to happen.

Haryanto (2020: 98); Rooholamini, et al., (2017: 248); Aziz, et al., (2018: 189); Hendra Divayana & Sanjaya (2017: 2); Darma (2019: 3) explains that product evaluation tries to accommodate information to ensure the achievement of goals under any conditions and also to determine what strategy is used in relation to the procedures and methods applied, whether it is better to stop doing it, modify it, or even continue it in the form of which is like now. Thus, the function of this product evaluation is an evaluation that can be used to help evaluators or teachers make decisions regarding the continuation, end or modification of the program. Thus, this product evaluation activity aims to help make further decisions. The question that must be answered is what results have been achieved and what has been done after the program is running, and this is the essence of product evaluation or evaluation of the results that have been achieved. In other words, product evaluation seeks to provide an assessment of the results achieved, so that the level of success can be measured and assessed in accordance with the goals that have been set. From this evaluation, it is then decided whether the program can be continued, discontinued, or used by modifying it. so that it can be measured and assessed the level of success in accordance with the goals that have been set. From this evaluation, it is then decided whether the program can be continued, discontinued, or used by modifying it. so that it can be measured and assessed the level of success in accordance with the goals that have been set. From this evaluation, it is then decided whether the program can be continued, discontinued, or used by modifying it.

Referring to the literature from previous research, various solutions that can be applied in overcoming online learning include combining learning models with Whatsapp media (Gon & Rawekar, 2017: 19; Mpungose, 2020: 927; Annamalai, 2019: 4; Costa-

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Sánchez & Guerrero-Pico, 2020: 3; Kaid Mohammed Ali & Rashad Ali Bin-Hady, 2019: 2; Rahaded, et al., 2020: 55; García-Gómez, 2020: 3). Likewise, the implementation of online learning requires no small cost, it requires various supporting components such as gadgets, electricity, and so on. Overcoming these obstacles, teachers should carry out manual learning programs, namely home visits, namely study visits from house to house (Atsani, 2020: 82; Nadeak, 2020: 1765; Usman & Huda, 2021: 3; Mantara, et al., 2020: 446).

CONCLUSIONS

Based on the results of the research and the results of data analysis that has been carried out, it is concluded that the evaluation of the implementation of adaptive physical education learning during the Covid-19 pandemic at Special Schools in Yogyakarta City was in the poor category. Furthermore, each evaluation aspect is explained as follows.

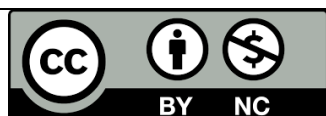
1. Context evaluation of the implementation of adaptive physical education learning during the Covid-19 pandemic at SLB Yogyakarta City in the good category. Indicators of learning materials and the formulation of objectives in the good category, organizing materials, media, and other learning resources in the good category, designing teaching and learning activities in the very good category, class management in the very good category, and assessment in the very good category.
2. Input the evaluation of the implementation of the evaluation of the implementation of adaptive physical education learning during the Covid-19 pandemic at SLB Yogyakarta City was good. Indicators of suitability of learning materials with KI KD in the good category and the characteristics of students in the less category.
3. Process evaluation of the implementation of the evaluation of the implementation of adaptive physical education learning during the Covid-19 pandemic at Special Schools in Yogyakarta City the results were in the less category. Indicators of learning activities in the less category and student activities in the less category.
4. Product evaluation of the implementation of the evaluation of the implementation of adaptive physical education learning during the Covid-19 pandemic at Special Schools in Yogyakarta City the results were in the less category. Indicators of achievement learning outcomes at Special Schools in Yogyakarta City are in the less category.

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Developing of a Multiple Intelligences-Based Elementary School Learning Kits to Improve Student Character of Social Awareness



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ABSTRACT: This study aims to produce learning tools based on multiple intelligences (interpersonal, intrapersonal and naturalist intelligences) that are appropriate and effective to improve the social awareness character of fifth grade elementary school students. The learning tools that will be developed are in the form of products which include teacher's manuals and student handbooks. The resulting product applies learning that contains 3 kinds of intelligence, the characters to be developed are social awareness, scientific approach, and student activity-oriented. This type of research is Research and Development (R&D), which uses the instructional development model from Dick & Carey. The product draft that is made is subject to content validation by experts to test the feasibility of the product. Furthermore, the draft was tested on a limited basis to small groups or individuals, after that a field trial with a wider scope was carried out and this trial was a test of the acceptance of the model and determined the feasibility and effectiveness of the product. This stage produces the final product in the form of a teacher manual and student handbook that is appropriate, practical and effective to increase social awareness of fifth grade elementary school students in Indonesia.

KEYWORDS: Learning kits, student character, multiple intelligences, social awareness

INTRODUCTION

The purpose of Indonesian national education is stated in Article 3 of Law Number 20 of 2003 concerning the National Education System to develop the ability of students to become human beings who believe and are devoted to God Almighty, have noble character, are capable, healthy, independent, creative. and become democratic and responsible citizens. Based on the goals of Indonesia's national education, the implementation of education must implement character education. According to Lickona in Pane & Patriana (2016) character education includes three components, namely moral knowing, moral feeling, and moral action. Character education is very urgent to shape the behavior of students, especially at the elementary school level because elementary school age is the right age to carry out education and character formation.

Akbar (Akbar et al., 2014) revealed that the problems of character in elementary schools, among others, are: 1) character education in elementary schools has a tendency not to be formed according to the principles of true value education; 2) do not have a main design for character education in their respective elementary schools; 3) the implementation of value and character education in elementary schools does not foster life values such as love, respect, peace, cooperation, obedience, democracy and not all of them form concern in the practice of character education in elementary schools; 4) various rules in character education in schools are more dominantly made by teachers and principals and are not enforced optimally; 5) implementation of education and learning that does not respect human dignity. The results of Akbar's research can indicate that education in elementary schools is still teacher-centered, not humanist, and has not implemented multiple intelligences that can develop the different potential of children's intelligence in each child. Therefore, it takes learning based on multiple intelligences or multiple intelligences, especially interpersonal intelligence, intrapersonal intelligence and naturalist intelligence. Interpersonal intelligence can shape children's social care, because interpersonal intelligence involves the ability to have empathy for others, the ability to interact or establish relationships, and is formed on the ability to know differences, temperament, motivation and attention (Gardner, 1993, p. 23).

Learning tools must be prepared according to the characteristics of students to provide opportunities for students to develop their potential (Chatib, 2015), (Surna & Pandeirot, 2014), (Wicaksono et al., 2014). This can be done by compiling learning

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tools that use varied learning strategies to accommodate all student potential (Suarca et al., 2016), (Surna & Pandeirot, 2014). In addition, the learning process that uses strategies to facilitate students' abilities (one of which is multiple intelligences) will help teachers create a series of learning activities that refer to learning indicators to achieve the expected competencies (Sudarma et al., 2019).

Responding to the above reality, multiple intelligences-based learning must be the main choice in the learning process where the purpose of education is to develop the ability of students to become human beings who believe and fear God Almighty, have noble character, are capable, healthy, independent, creative and become democratic and responsible citizens (Law No. 20 of 2003).

Learning in elementary school children should be carried out with the aim of providing basic concepts that have meaning for children through real experiences that allow children to show activity and curiosity optimally. Then put the position of the teacher as a companion, mentor and facilitator for children. An educational process like this can balance learning that is only oriented to the will of the teacher which places the child passively and the teacher becomes dominant. Dependence at the beginning of life is something that is natural, but with time there comes a time when children have to be more independent, so there needs to be a balance between the roles and parenting patterns of educators who are too dominant to become more democratic so that students have the freedom to explore the world around them.

In reality, child-centred learning is currently far from being desired. The learning process in schools is still centered on the teacher (teacher centered) and not yet on the child (student centered). This can be interpreted that the learning process in schools tends not to develop critical, creative and innovative thinking, but only strengthens the ability of the left brain. The phenomenon that appears is that many teachers educate their children to sit still, be quiet and just listen. Creative children who are always on the move and ask a lot of questions are actually seen as hyperactive and naughty children.

Multiple intelligences-based learning will provide the widest possible opportunities for students to grow and develop in line with their potential, talent, active and creative. The formation of student character can be formed through learning if the learning carried out can stimulate students to behave according to their potential, develop themselves and actualize them in real life. This can be done by applying humanistic and cognitive-constructivist learning theories. Humanistic learning theory is learning that focuses on students and the teacher only facilitates (Komara, 2014, p. 2). The learning process in elementary schools must refer to the national curriculum. The national curriculum that is in accordance with the application of humanistic and constructivist learning is the 2013 curriculum. The 2013 curriculum is student-centered learning that applies thematic-integrative learning with a concrete, integrative and hierarchical approach. With thematic learning, students can gain hands-on experience and get used to being able to find out for themselves a variety of knowledge that is learned thoroughly, meaningfully, authentically and actively (Warso, 2013, p. 36). Therefore, the learning device that will be developed in this study uses the 2013 curriculum based on multiple intelligences.

Research on learning devices based on multiple intelligences has been studied by previous researchers. Research from Nur Faidah (2012) which examines the implementation of multiple intelligences learning methods for students of primary education age by teachers. Eni Purwati's research (2011) which examines the application of multiple intelligence systems (MIS) in junior high schools. Research by Probowening, Sopyan and Handayani (2014) on development by developing learning materials based on multiple intelligences in order to increase the level of motivation and student achievement in learning Physics for junior high school students.

This study has a difference compared to previous studies, namely that previous researchers only examined learning or multiple intelligences-based learning methods applied by teachers or schools. Meanwhile, previous research that carried out the development was the development of multiple intelligences learning strategies that did not produce products in the form of books or learning modules, and were only validated by experts. This research was not carried out by previous researchers, because this research developed multiple intelligence-based learning tools to improve the character of elementary school students which produced products in the form of teacher handbooks and modules or teaching materials for students. The product was not only validated by experts, but also tested on teachers and students in elementary schools in a small and broad scope so that the product could be disseminated to elementary schools or madrasah ibtidiyah in a broad scope.

LITERATURE REVIEW

The most basic purpose of education is to change a person into a good and intelligent person. An educated person must be a person who can use his knowledge for good deeds. Therefore, a successful education system is one that can equip individuals with the good characters needed to build the nation (Pane & Patriana, 2016).

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Character education is the goal of the school by creating an environment where students can learn well (Mei-Ju et al., 2014). There are various kinds of teaching and approaches to guide students in recognizing character education. The newer approach is intended to improve the social caring character of elementary school students.

Social sensitivity can simply be interpreted as a person's ability to react quickly and accurately to certain social objects or situations around him. There are various social concerns including sharing with others, being willing to help people in need, having the courage to apologize if they make mistakes, and respecting other people who have different conditions (Tondok, 2012: p.6).

Bennett (Lickona, 2008: p.87) says that people who have good character act sincerely, loyally, bravely, virtuously, and fairly without being tempted by the opposite. They do the right thing out of habit. Someone who has high social sensitivity will easily have a high sense of caring for others.

Mu'in (2011: 231) states that caring is a trait that makes the perpetrators feel what other people feel, know how it feels to be someone else, sometimes indicated by the act of giving or being involved with the other person. Samani and Hariyanto (2011: 25) caring means treating others politely, acting politely, tolerant of differences, not liking to hurt others, willing to listen to others, willing to share, not demeaning others, not taking advantage of others, able to cooperate, want to be involved in community activities, love humans and other creatures, loyal, love peace in dealing with problems.

According to Rachman (2011: 25) indicators in caring are: (1) maintaining cleanliness, beauty, and natural preservation; (2) provide assistance in accordance with their abilities to other people who are affected by disasters or are less fortunate in their lives; (3) not being indifferent to changes or environmental conditions;

In Character Counts (2012, 56), there are several things to be a caring person, namely: 1) Treat others with kindness and generosity, 2) Help people who need help, 3) Be sensitive to other people's feelings, 4) Never be rude or like to offend, 4) Think about how your actions will hurt or hurt other people, 5) Always remember that we will be people who care about actions that are based on caring.

People who have social concern are people who when they see other people in difficult or sad conditions will not just stop looking at that person, but do something (give money and or goods, or other things) to help that person. People who have social concern will not do things that hurt or harm others.

The development of social caring character can be done in multiple intelligences-based learning because one of the intelligences in multiple intelligences, namely interpersonal intelligence, involves the ability to have empathy for others, the ability to interact or establish relationships, and is built on the ability to know differences, temperament, motivation, and attention. (Gardner, 1993: 23)

The theory of multiple intelligences was introduced in the early 1980s by Howard Gardner who defined this theory as the ability to solve problems or create products of value in a culture or society (Alsalhi, 2020; Shearer & Karanian, 2017). Multiple intelligences is an assessment that looks descriptively at how individuals use their intelligence to solve problems and produce something (Gardner, 1993).

Gardner argues that the theory of multiple intelligences is one of the new changes for the learning process because for Gardner everyone has their own abilities and varies between individuals both in the level and type of skills they have (Alsalhi, 2020). There are eight intelligences identified in the theory of multiple intelligences which include verbal linguistic intelligence, logical mathematical intelligence, visual/spatial intelligence, musical intelligence, body kinesthetic intelligence, naturalistic intelligence, interpersonal intelligence, and intrapersonal intelligence (Alsalhi, 2020; Sahli et al., 2011).

Each individual has its own uniqueness. Each individual has different preferences, interests and skills. Based on the theory of multiple intelligences that each individual has a different intelligence. The level of individual intelligence is not only determined by the magnitude of the IQ number but also other abilities, namely the ability to solve problems at hand, formulate new problems to find solutions or create something of value (Sahli et al., 2011). Everyone may have one dominant intelligence and another secondary intelligence in the learning process.

Abenti (2020) suggests that multiple intelligences is the best way to educate and communicate with students in a diverse and modern classroom environment. Not all students have the same learning style and every teacher has a different teaching style based on their own uniqueness. The curriculum based on the theory of multiple intelligences integrates teaching and learning processes and evaluation with intelligence development so as to produce an integrated and meaningful process (Díaz-Posada et al., 2017).

Learning styles have an important place in learning, namely how to learn (Carroll, 2001). Student learning styles contribute to the effectiveness of learning. The effectiveness of learning will decrease if students study in an environment that is not in accordance with their learning style (Kazu, 2009). According to the theory of multiple intelligences, each student has different intelligences. Students will more easily understand the lesson if the material is presented in accordance with the intelligence that

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stands out in students. For example, if students excel in musical intelligence, they will easily understand certain subjects, such as biology, if they are explained by incorporating elements of music into them. If students excel in visual intelligence, they will more easily catch the lesson if it is explained using a variety of observable forms (Hamzah, 2009). Because the intelligence of students in the class varies, the teacher needs to enter and process the material to be taught according to the intelligence of the students.

Elementary school material developed in this study is material that can support the achievement of character education goals for elementary school students through learning based on multiple intelligences. This study aims to create a learning device about character education, the material to be developed is that which contains core competencies 1 and core competencies 2 which are related to the purpose of building student character. The material is also material that can be given to students with a multiple intelligences-based learning model for elementary school children and is based on integrative thematic learning. Elementary school material in the 2013 curriculum is integrative thematic in which the learning emphasizes the ability to read, write, count and inculcate moral values, is the right material to be developed in research on character education for elementary school children based on multiple intelligences, and is predicted to be able to shape character social awareness.

METHOD

The type of research used in this research is Research and Development (R&D), which uses the instructional development model of Dick & Carey. Research and development methods are research methods used to produce certain products, and test the effectiveness of these products (Sugiyono, 2012, p. 297). The instruments developed in this study were a questionnaire/questionnaire and an assessment instrument (test). The draft model/product made by the researcher was validated by the experts to test the feasibility of the product. Furthermore, the draft is tested on a limited basis in small groups or individuals, after that a field trial with a wider scope is carried out and this test is a test of model acceptance and determines the feasibility of the product. This stage will produce the final product in the form of teacher manuals, lesson plans, student handbooks, student worksheets and evaluation instruments that will be used as learning tools for elementary school students.

RESULT AND DISCUSSION

The initial product is the initial draft of the learning device made by the researcher before it becomes the final product to be used as a learning tool in elementary schools or madrasah Ibtidaiyah on a large scale, which is tested first. As explained above, researchers have made learning device products in the form of teacher manuals and teaching materials for fifth grade elementary school students using the 2013 curriculum which contains subject matter for theme 3, namely the theme of healthy food which includes 3 sub-themes, namely sub-theme 1, sub-theme 2 and sub-theme 3. There are four further research steps that must be carried out until the developed learning tools can be disseminated and used as learning tools, namely: 1) validation or review by experts with the aim of asking for advice, improvement and input from experts, 2) small group or individual trials and small group trials, namely to fifth grade elementary school students in 2 elementary schools based on multiple intelligences, 3) field trial or broad test (field trial evaluation) involving more schools and in a wider scope. more broadly, 4) revisions if any, revisions can be made based on the results of the feasibility test from the experts, the results of small-scale trials and results of large-scale trials.

The purpose of the above steps is to get feedback and input from experts and potential users of learning tools. Feedback and input from experts and potential users are as a basis or reference for researchers to make revisions or improvements to the developed learning tools. The results of the feasibility test from the experts, small or limited-scale trials and large-scale trials are as follows:

1. Model Eligibility

The implementation and results of the feasibility test can be explained in detail as follows:

a. Result of expert review (expert review)

In the service test or assessment by experts, researchers use four categories of experts, namely character education experts, multiple intelligence experts, learning design experts and learning evaluation experts. The following is a list of experts along with their backgrounds and expertise in their respective fields.

Table 1. List of Experts who conducted due diligence

No	Area of expertise	Quantity
1	character education expert	2 people
2	Multiple intelligence expert	2 people
3	learning material experts	2 people
4	learning design experts	2 people
5	learning evaluation experts	3 people

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The feasibility test of the experts was carried out by distributing validation instruments in the form of a questionnaire or questionnaire to the experts. The results of the answers from the experts were then analyzed with the following analytical steps: 1) Tabulated all data obtained from the validator for each component/aspect and assessment item available in the instrument; 2) Calculate the score of each component/aspect. Changing the score into a value with five scale criteria with the categories of response choices, namely very good (5), good (4), quite good (3), not good (2), not good (1); 3) Calculate the value with five scale criteria from each component/aspect with the percentage formula.

Furthermore, the validity of the expert's assessment was analyzed using the Aiken formula (1985) to calculate the content-validity coefficient based on the results of the assessment of the expert panel of n people on an item in terms of the extent to which the item represents the construct being measured.

The aspects studied on the character of social care are: 1) Encouraging the growth and development of attitudes and actions that reflect concern for other people and communities in need, 2) Motivating students to maintain cleanliness, beauty, and nature preservation, 3) Guiding students to provide assistance according to their ability to other people in need, and 4) Motivating students not to be indifferent to environmental conditions.

The results of the feasibility test for the content of social care characters in teacher handbooks and student teaching materials are based on scores from the questionnaire answers distributed to experts which are then analyzed using the Aiken formula, the results are as follows:

Table 2. The results of the feasibility test for the character of social care

Character	Aspect	Result Aiken	Description
social care	1	0.850	Valid
	2	0.750	Valid
	3	0.750	Valid
	4	0.750	Valid
V. Aiken		0.797	Valid

Based on table 2 above, it is known that the results of the feasibility test from the experts on the content of the social care character in the initial draft of the learning device to improve the student's social awareness character developed by the researcher was declared valid because the V value of 0.797 was greater than 0.7. Thus, the initial draft of the learning device developed by the researcher in terms of the character of students' social care can be declared eligible and can be continued on the next test without revision.

The suggestions or input from students' character education experts related to the content of social care and creativity characters in the initial draft of learning tools to improve the character of social awareness and creativity of students developed are as follows:

Table 3. Input / input of character education experts

Input	Expert
1 st	Appropriate to use according to the advice. The input is to correct or revise grammatical / grammatical errors in the validation instrument, not in the draft learning device
2 nd	Worth using according to suggestion. The input is to correct or revise grammatical / grammatical errors in the validation instrument, not in the draft learning device

Based on the input or suggestions from the character education experts above, researchers need to make revisions or improvements to some grammatical/grammar errors in the instrument or validation questionnaire distributed to experts where the improvement does not change the substance or content of the items/items of the validation instrument statement. , not on the draft of the developed learning device. This can be interpreted that the draft of the learning tools developed in terms of the content of the character of students' social care does not need to be revised.

The results of the feasibility test for the content of interpersonal, intrapersonal and naturalist intelligence in the teacher's handbook and student teaching materials based on the scores from the questionnaire answers distributed to the experts which were then analyzed using the Aiken formula obtained the following results:

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Table 4. The results of the interpersonal, intrapersonal and naturalist intelligence test results

Intelligence	Aspect	Result Aiken	Description
Naturalist			
	1	0.875	Valid
	2	0.750	Valid
	3	0.750	Valid
Interpersonal			
	1	0.750	Valid
	2	0.750	Valid
	3	0.875	Valid
Intrapersonal			
	1	0.875	Valid
	2	0.875	Valid
	3	0.875	Valid
V. Aiken		0.819	Valid

Based on table 4 above, it is known that the results of the feasibility test from the experts on the content of interpersonal, intrapersonal and naturalist intelligence in the initial draft of multiple intelligences-based learning tools to improve the character of students' social care developed were declared valid because the value of V aiken was 0.819 greater. of 0.7. Thus, the initial draft of the learning device developed in terms of the content of interpersonal, intrapersonal and naturalist intelligence can be declared eligible and can be continued on the next test without revision.

The results of the feasibility test for the design of the draft teacher handbook and books for students were based on scores from the answers to the questionnaire distributed to the experts which were then analyzed using the Aiken formula. This feasibility test includes design and learning materials with 50 items or validation items covering all aspects of design and learning materials. The results of the feasibility test are as follows:

Table 5. The results of the feasibility test for the design of the draft teacher handbook and books for students

Item	Aiken Validation Result	Description
1	0.875	Valid
2	0.875	Valid
3	0.875	Valid
4	0.875	Valid
5	0.750	Valid
6	0.750	Valid
7	1.000	Valid
8	0.875	Valid
9	1.000	Valid
10	0.875	Valid
11	0.750	Valid
12	0.750	Valid
13	0.750	Valid
14	0.750	Valid
15	0.875	Valid
16	0.875	Valid
17	0.875	Valid
18	0.875	Valid
19	0.875	Valid
20	0.875	Valid
21	0.875	Valid
22	0.875	Valid

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Item	Aiken Validation Result	Description
23	0.750	Valid
24	0.750	Valid
25	0.750	Valid
26	0.750	Valid
27	0.750	Valid
28	0.750	Valid
29	0.750	Valid
30	0.750	Valid
31	0.750	Valid
32	0.750	Valid
33	0.750	Valid
34	0.750	Valid
35	0.750	Valid
36	0.750	Valid
37	0.750	Valid
38	0.875	Valid
39	0.750	Valid
40	0.750	Valid
41	0.875	Valid
42	0.875	Valid
43	0.875	Valid
44	0.750	Valid
45	0.875	Valid
46	0.750	Valid
47	0.875	Valid
48	0.875	Valid
49	0.875	Valid
50	0.875	Valid
V.Aiken	0,818	Valid

Based on table 5 above, it is known that the results of the feasibility test from the experts on the draft teacher handbook design, lesson plans and student learning modules as well as the material developed by the researchers were declared valid because the value of V aiken was 0.818 which was greater than 0.7. Thus, the initial draft of the learning device developed by the researcher in terms of design and learning materials can be declared to meet the feasibility and can be continued in the next test. It can also mean that the learning draft on the design and learning materials meet the feasibility in terms of format, organization, attractiveness, font shape and size, space (empty space), consistency and presentation of images. Likewise, the learning materials contained in the learning modules or student teaching materials have met the eligibility in terms of self-instructional, self-contained, stand-alone, adaptive, user friendly, clarity of message, content representation, classical/individual.

The suggestions or input from learning design experts and learning module materials or student teaching materials in the initial draft of multiple intelligences-based learning tools to improve the character of social awareness and student creativity developed by researchers are as follows:

Table 6. Input / input from learning design experts and learning materials

Input	Expert
1 st	Suitable for use with revisions according to suggestions. The inputs are: <ul style="list-style-type: none"> - The use of icon marks needs to be clarified, explained in advance, and uniformed. - pictures or illustrations seem to need to be made more attractive by being illustrated by illustrators.

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- point (3) can be circumvented by using an interesting combination of text, paper, and colors
- The structure of language or sentences in the text needs to be simplified
- cover made more attractive
- The design of each chapter is given an attractive picture

2nd Worth using without revision. No input.

Based on the input or suggestions from the learning design experts and the learning materials or student teaching materials above, the researchers need to make revisions or improvements to the draft design of the learning tools developed while the learning materials do not need to be revised. This can be interpreted that the draft of learning tools developed by researchers from the design side needs to be revised in the form of: clarifying icon signs and giving explanations at the beginning and uniformly, making pictures or illustrations that are more attractive with the help of an illustrator or combined with text, paper and colors that interesting, simplification of the structure of language or sentences in the text, the cover is made more attractive and each chapter is given an interesting picture. These improvements were made to impress and attract students' interest in learning.

The results of the feasibility test for evaluating learning on student teaching materials are based on scores from the answers to the questionnaire distributed to the experts which are then analyzed using the Aiken formula. In this feasibility test, there are 16 items of validation questions/statements. The results of the feasibility test of the learning evaluation draft from the experts are as follows:

Table 7. The results of the feasibility test of the learning evaluation draft

Item	Aiken Result	Validation	Description
1	0.833		Valid
2	1.000		Valid
3	1.000		Valid
4	0.833		Valid
5	0.917		Valid
6	0.833		Valid
7	0.917		Valid
8	0.917		Valid
9	0.750		Valid
10	0.750		Valid
11	0.833		Valid
12	0.833		Valid
13	0.750		Valid
14	0.750		Valid
15	0.917		Valid
16	0.750		Valid
V. Aiken	0.849		Valid

Based on table 7 above, it is known that the results of the feasibility test from the experts in the learning evaluation draft developed by the researchers were declared valid because the value of V aiken was 0.849 which was greater than 0.7. Thus, the initial draft of student teaching materials on the learning evaluation developed by researchers in terms of the learning evaluation can be declared eligible and can be continued in the next test. It can also mean that the learning draft in the design and learning materials meet the feasibility in terms of clarity, content accuracy, relevance, content validity, no bias, and language accuracy.

The suggestions or input from learning evaluation experts in the initial draft of multiple intelligences-based student teaching materials to improve the character of social awareness and creativity of students developed are as follows:

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Table 8. Input/input of learning evaluation experts

Input	Expert
1 st	Suitable for use with revisions according to suggestions. The inputs are: <ul style="list-style-type: none">- We recommend that in one option it is enough to include one option- needs to improve the conversation between Sinta and Yuri contained in the draft of student teaching materials page 18 Material 4.
2 nd	Worth using without revision. No input.
3 rd	Worth using without revision. No input

Based on the input or suggestions from the learning evaluation experts above, the researchers need to make revisions or improvements, namely in the form of improving the options in the answer choices, and improving the conversation between Sinta and Yuri contained in the draft student teaching materials page 18 Material 4. carried out by the researcher, the next test can be carried out using a second draft that has been revised or improved by the researcher.

b. Small-scale trial results

After revisions or improvements have been made to the initial draft of the developed learning tools, the initial draft is called draft 1. Draft 1 is then carried out small-scale trials which include individual tests, namely to several teachers from 2 schools, and small groups, namely to several students at 2 elementary schools based on multiple intelligences. Small-scale trials, namely individual and small group tests, aim to test the feasibility of draft 1 learning device which is an initial draft that has been revised according to input or input from experts.

Small-scale trials on individual tests, namely to 3 teachers from 2 elementary schools (2 SD IT Annida Purwokerto teachers and 1 MI Ma'arif NU teacher Dawuhan Wetan), and small groups to students in 2 schools, namely 5 people. SD IT Annida Purwokerto students and 5 students from MI Ma'arif NU Dawuhan Wetan. The results of individual tests and trials in small groups, namely on a small scale, are as follows:

a) Individual test results

Individual tests were carried out on 3 teachers, namely 2 SD IT Annida Purwokerto teachers and 1 MI Ma'arif NU teacher Dawuhan Wetan. This individual test aims to test the feasibility of the draft 1 learning tool developed by the researcher. This individual test was carried out by filling out a questionnaire distributed by the researchers after the teachers had read and looked at the draft 1 of the learning tools developed. The teacher's guide book feasibility test includes aspects: 1) content feasibility, 2) presentation feasibility, and 3) language feasibility. The feasibility test of teaching materials or learning modules for students includes multiple intelligences and student character. The multiple intelligences charge covers aspects of naturalist intelligence, interpersonal intelligence and intrapersonal intelligence. The content of the student's character includes the character of social care and student creativity. The results of the feasibility test for the draft 1 learning tool in the teacher's manual, it is known that each content feasibility indicator gets a score from the teachers on average is B or good. These results can indicate that the feasibility of the contents of draft 1 of the learning device developed by the researcher from the content or material content is good, so it is feasible to be used in learning tools.

The results of the presentation feasibility test can be seen that each presentation feasibility indicator gets a score from the teachers on average is 4 which means good. These results can indicate that the feasibility of the presentation of draft 1 of the learning tool developed in terms of material presentation is good, so it is feasible to be used as a learning tool.

The results of the language feasibility test showed that each of the language eligibility indicators received an average score of 4 from the teachers, which means good. These results can indicate that the language used in draft 1 of the learning tool developed by the researcher is good, so that draft 1 is feasible to be used as a learning tool.

The results of the feasibility test for draft 1 learning modules or teaching materials for students are as follows:

1) The results of the naturalist intelligence load test

The results of the naturalist intelligence load test of draft 1 teaching materials for students given by the respondents were that each indicator of the naturalist intelligence content got a score from the teachers, the average was 4, meaning it was good. These results can indicate that the content of naturalist intelligence in draft 1 of the learning tool developed by the researcher is good, so that draft 1 is feasible to be used as a learning tool.

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2) The results of the intrapersonal intelligence load test

The results of the intrapersonal intelligence content test of draft 1 of teaching materials for students given by the respondents, namely teachers, that each indicator of intrapersonal intelligence content scored from the teachers on average was 4, meaning it was good. These results can indicate that the content of intrapersonal intelligence in draft 1 of the learning tool developed by the researcher is good, so that draft 1 is feasible to be used as a learning tool.

3) The results of the interpersonal intelligence load test

The results of the interpersonal intelligence load test of draft 1 teaching materials for students given by the respondents, namely teachers, it is known that each indicator of interpersonal intelligence content gets a score from the teachers on average is 4 which means good. These results can indicate that the content of interpersonal intelligence in draft 1 of the learning tool developed by the researcher is good, so that draft 1 is feasible to be used as a learning tool.

4) The results of the social care character load test

The results of the social care character load test of draft 1 of teaching materials for students given by the respondents, namely teachers, the results are known that each indicator of the social care character content gets a score from the teachers on average is 4 which means it is good. These results can indicate that the content of the social care character in draft 1 of the learning tool developed by the researcher is good, so that draft 1 is feasible to be used as a learning tool.

Small-scale or limited-scale trials in the form of small group trials for fifth grade elementary school students which include students in 2 schools, namely 5 students of SD IT Annida Purwokerto and 5 students of MI Ma'arif NU Dawuhan Wetan. Testing for students is testing on teaching materials or learning modules for students which includes multiple intelligences and student character. The multiple intelligences charge covers aspects of naturalist intelligence, interpersonal intelligence and intrapersonal intelligence. On the charge of the student's character includes the character of students' social care.

Small-scale trials were carried out during the COVID-19 pandemic, so face-to-face learning was carried out with a limited number of students. Testing on students is carried out with the following steps:

1) Conduct pre-test to students

Researchers conducted a pre-test to students to find out how the character of students' social care and intelligence which included intrapersonal, interpersonal and naturalist intelligence was at the beginning, namely before being given learning using draft 1 of the learning module or teaching materials developed by the researcher. Pre-test is done by giving questionnaires to students to be answered. The questionnaire is a character questionnaire that contains the character of students' social care, and a multiple intelligences questionnaire that contains intrapersonal, interpersonal and naturalist intelligence. After the questionnaire is filled out then it is submitted to the teacher to be assessed, and later it will be compared with the post test scores after learning using draft 1 of the learning module or teaching materials developed by the researcher.

2) Conducting learning activities for students

The fifth grade teacher conducts learning activities for students using draft 1 learning modules or teaching materials for students developed by researchers. The teacher carries out learning activities according to the teacher's manual developed by the researcher. Student activity and response during the learning process took place very well. All students are actively involved in the learning activities carried out by the teacher.

3) Conducting learning evaluation

The final part of the learning process is that the teacher evaluates learning to determine the extent to which the learning material can be absorbed or understood by students which can reflect the effectiveness of the 1st draft of the learning module for students being applied as teaching materials for students in the field. Learning evaluation uses an evaluation instrument developed by the researcher. The evaluation instrument is filled with answers by students, then collected by the teacher to be corrected and assessed by the teacher.

4) Doing post test

The researcher conducted a post test to the students to find out how the character of students' social care and intelligence which included intrapersonal, interpersonal and naturalist intelligence was at the end, namely after being given learning using draft 1 of the learning module or teaching materials developed by the researcher. The post test was carried out by giving the same questionnaire to students to answer, namely a character questionnaire containing the character of students' social care, and a multiple intelligence questionnaire containing intrapersonal, interpersonal and naturalist intelligence. After the questionnaire is filled out, it is then handed over to the teacher to be assessed, and later it will be compared with the pre-test scores to find out whether there is an increase in the value that indicates an increase in character and an increase in intelligence in students.

The results of the learning evaluation, pre-test and post-test conducted to students are as follows:

1) Learning evaluation results

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Learning evaluation is carried out at the end of each sub-theme learning after being taught to students, using an instrument developed by the researcher in accordance with the material in each sub-theme. In draft 1, the learning module or student teaching materials developed by the researcher contains 3 sub-themes, so that the learning evaluation is carried out 3 times, namely in sub-theme 1, sub-theme 2 and sub-theme 3. The results of the evaluation of learning are as presented in the table below. below. it is known that the value of student learning evaluation results is high. The value of the evaluation results of student learning in sub-theme 1 is high, where the lowest score is 80 and the highest value is 100. The value of the evaluation results of student learning in sub-theme 2 is very high, where all students get the highest score of 100. The value of the evaluation results student learning in sub-theme 3 is very high, where the lowest score is 90 as many as 3 students and 7 other students get the highest score of 100.

2) The results of the pre-test and post-test of students' character

a) The results of the student character pre test

The pre-test was carried out before students received learning using draft 1 of the learning module or teaching materials developed by the researcher. The pre-test questionnaire on character contains 20 items of questions/statements on the character of students' social care, consisting of positive and negative questions/statements. The questionnaire was compiled using a scale of 1-4 with a gradation of answers to positive questions/statements, namely strongly agree (SS) score 4, agree (S) score 3, disagree (KS) score 2, disagree (TS) score 1. While the gradation of answers on negative questions/statements, namely strongly agree (SS) score 1, agree (S) score 2, disagree (KS) score 3, disagree (TS) score 4.

After conducting a pre-test to students in schools where small-scale or limited-scale field trials were conducted, it showed that the character of students' social awareness before learning using draft 1 of the learning module or teaching materials developed by the researchers was relatively high.

b) The results of the student character post test

The post test is carried out after students receive learning using draft 1 of the learning module or teaching materials developed by the researcher. The post test questionnaire is the same as the questionnaire used for the pre test, which is about the character of students' social care which consists of positive and negative questions/statements, using a scale of 1- 4 with a gradation of answers to positive questions/statements, namely strongly agree (SS) score 4, agree (S) score 3, disagree (KS) score 2, disagree (TS) score 1. While the gradation of answers to negative questions/statements is strongly agree (SS) score 1, agree (S) score 2, disagree (KS) score 3, disagree (TS) score 4.

After the post test was conducted, the results showed that the character of students' social care after learning using draft 1 of the learning module or teaching materials developed by the researchers could be said to be very high.

c) Differences in student character after learning with draft 1

After conducting the pre-test and post-test to the students, then an analysis of the data was carried out to find out whether there were significant differences in the student's social care data which indicated an increase in the character of social awareness after learning using draft 1 of the learning module or teaching materials developed by the researcher. After analyzing the data using the pair sample test test with the help of SPSS, the results are known that the t-count value from the results of the different social care character values before learning with draft 1 (pre test) and after learning with draft 1 (post test) is 11,667 greater from t table that is 2,228 with a significance value of 0.000 less than 0.05. These values indicate that the value of the social care character after learning with draft 1 (post test) is significantly different or significantly different from the social care character of students before learning with draft 1 (pre test), where the post test value is higher than the pre test value.

3) The results of the students' multiple intelligence pre-test and post-test

a) The results of the students' multiple intelligence pre-test

The pre-test questionnaire on multiple intelligences contains 10 items of interpersonal intelligence questions/statements, 6 items of intrapersonal intelligence and 14 items of naturalist intelligence consisting of positive and negative questions/statements. The questionnaire was compiled using a scale of 1-4 with a gradation of answers to positive questions/statements, namely strongly agree (SS) score 4, agree (S) score 3, disagree (KS) score 2, disagree (TS) score 1.

While the gradation of answers to negative questions/statements is strongly agree (SS) score 1, agree (S) score 2, disagree (KS) score 3, disagree (TS) score 4. After pre-test on multiple intelligences is carried out to students , the result is that students' interpersonal intelligence before learning using draft 1 learning module or teaching materials developed by researchers is relatively high. Furthermore, the naturalist intelligence of students before learning using draft 1 of the learning module or teaching materials developed by researchers is relatively high. And students' intrapersonal intelligence before learning using draft 1 of the learning module or teaching materials developed was relatively high.

b) The results of the post test of students' multiple intelligences

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The post-test questionnaire on multiple intelligences is the same as the questionnaire used during the pre-test, namely a questionnaire containing 10 items of interpersonal intelligence questions/statements, 6 items of intrapersonal intelligence and 14 items of naturalist intelligence consisting of positive and positive questions/statements. negative and arranged using a scale of 1-4 with a gradation of answers to positive questions/statements, namely strongly agree (SS) score 4, agree (S) score 3, disagree (KS) score 2, disagree (TS) score 1. Gradation of answers on negative questions/statements, namely strongly agree (SS) score 1, agree (S) score 2, disagree (KS) score 3, disagree (TS) score 4.

After conducting a post test on multiple intelligences to the students, the results showed that the students' interpersonal intelligence after learning using draft 1 of the learning module or teaching materials developed by the researcher was high. Furthermore, the naturalist intelligence of students after learning using draft 1 of the learning module or teaching materials developed is high. And students' intrapersonal intelligence after learning using draft 1 learning module or teaching materials developed by researchers is high.

c) Differences in students' multiple intelligences after learning with draft 1

After pre-test and post-test were conducted on students, then an analysis of the data was carried out to find out whether there were significant differences in the interpersonal, naturalist and intrapersonal intelligence data of students which indicated an increase in student intelligence after learning using draft 1 learning module or teaching materials developed. by researchers. After analyzing the data using the pair sample test with the help of SPSS, the result is that the t-count value of the results of the interpersonal intelligence test before learning with draft 1 (pretest) and after learning with draft 1 (post test) is 10.434 greater than t table is 2,228 with a significance value of 0.000 less than 0.05. These values indicate that the interpersonal intelligence character values after learning with draft 1 (post test) are significantly different or significantly different from students' interpersonal intelligence before learning with draft 1 (pre test), where the post test scores are higher than the pre test scores.

The calculated t value from the results of the different naturalist intelligence scores before learning with draft 1 (pre test) and after learning with draft 1 (post test) is 20.013, which is greater than t table, which is 2,228 with a significance value of 0.000 less than 0.05. These values indicate that the value of naturalist intelligence after learning with draft 1 (post test) is significantly different or significantly different from the naturalist intelligence of students before learning with draft 1 (pre test), where the post test value is higher than the pre test value.

The t-count value from the results of the different intrapersonal intelligence test scores before learning with draft 1 (pre-test) and after learning with draft 1 (post-test) is 12.658, which is greater than the t-table, which is 2.228 with a significance value of 0.000 less than 0.05. These values indicate that the value of intrapersonal intelligence after learning with draft 1 (post test) is significantly different or significantly different from the intrapersonal intelligence of students before learning with draft 1 (pre test), where the post test value is higher than the pre test value.

Based on the results of small-scale trials, namely individual and small group tests to students in 2 SD/MI schools as described above, where the results of the feasibility test of the draft 1 learning tool carried out by teachers through individual tests were declared eligible, then the results In small group tests, students' learning outcomes using draft 1 learning modules or teaching materials for students are high, and the post test scores for students' character and multiple intelligences are higher than the scores of students' pre test results for character and multiple intelligences showing the module. learning or teaching materials for students are developed, then no revision is made to draft 1 of the learning tools developed.

5) Large-scale Trial Results

After the researcher conducted field test 1 on draft 1 of the learning device developed by the researcher, then further tests were carried out, namely field tests on a wider scale, namely individual tests to teachers from 5 SD/MI schools and to fifth grade students from 5 SD/MI schools. Field test 2, namely individual and group tests on a wide scale, aims to test the feasibility of draft 1 of the learning device which is a draft that has passed small scale trials.

The broad-scale trial was an individual test, namely to 10 teachers from 5 SD/MI, namely 2 SD IT teachers Annida Purwokerto, 2 MI Ma'arif NU teachers Dawuhan Wetan, 2 MIT teachers Lukman Hakim Slawi, 2 teachers at MIIN 1 Tegal and 2 SD IT Harapan Bunda Purwokerto teachers as well as field tests on a wide scale to students in 5 SD/MI namely SD IT Annida Purwokerto, MI Ma'arif NU Dawuhan Wetan, MI Lukman Hakim Slawi, MIIN 1 Tegal and SD IT Harapan Bunda Purwokerto has 15 students each.

The students who were used as respondents in the large-scale trial of teaching materials or learning modules for students were not named one by one because the number was very large, they were only coded R1 – R15 for each school that was used as a location for field tests 2 or wide-scale tests. this.

Furthermore, the results of individual tests and trials in small groups, namely on a small scale, are as follows:

a. Individual test results

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The individual test aims to test the feasibility of the draft learning device developed by the researcher. This individual test was carried out by filling out a questionnaire distributed by the researchers after the teachers had read and looked at the draft of the learning tools developed by the researchers.

The teacher's guide book feasibility test includes aspects: 1) content feasibility, 2) presentation feasibility, and 3) language feasibility. The feasibility test of teaching materials or learning modules for students includes multiple intelligences and student character. The multiple intelligence charge covers aspects of naturalist intelligence, interpersonal intelligence and intrapersonal intelligence. On the charge of the student's character includes the character of students' social care. It is known that each content feasibility indicator scores from the teachers an average of 5 or very good. These results can indicate that the feasibility of the contents of the 1st draft of the learning tool developed by the researcher from the content or material content is very good, so it is feasible to be used in learning tools.

2) Presentation feasibility test results

The results of the feasibility test for presenting the draft of learning tools from the respondents were that each indicator of the feasibility of presenting the score from the teachers on average was 5, meaning it was very good. These results can indicate that the feasibility of presenting the draft 1 of the learning tool developed by the researcher in terms of presenting the material is very good, so it is feasible to be used as a learning tool.

3) Language feasibility test results

The results of the language feasibility test from draft 1 given by the respondents can be seen that each of the language eligibility indicators scores from the teachers on average 5, which means very good. These results can indicate that the language used in the draft of learning tools developed by researchers is very good, so that draft 1 is feasible to be used as a learning tool.

The results of the feasibility test for the draft of learning modules or teaching materials for students include the contents of the intelligence and character of students, namely as follows:

1) The results of the naturalist intelligence load test

The results of the naturalist intelligence load test of draft 1 teaching materials for students given by the respondents, namely teachers, it is known that each naturalist intelligence charge indicator gets an average score of 4.5 which can be interpreted as very good. These results can indicate that the content of naturalist intelligence in the draft of learning tools developed by researchers is very good, so that this draft is feasible to be used as a learning tool.

2) The results of the intrapersonal intelligence load test

The results of the intrapersonal intelligence charge test of the draft teaching materials for students given by the respondents, namely teachers, it is known that each indicator of the intrapersonal intelligence content gets an average score of 4.6 which can be interpreted as very good. These results can indicate that the content of intrapersonal intelligence in the draft of the learning tool developed by the researcher is very good, so that this draft is suitable to be used as a learning tool.

3) The results of the interpersonal intelligence load test

The results of the interpersonal intelligence load test of draft 1 teaching materials for students given by the respondents, namely teachers, it is known that each indicator of interpersonal intelligence content gets a score from the teachers on average is 4.5 which can be interpreted very well. These results can indicate that the content of interpersonal intelligence in the draft of learning tools developed by researchers is very good, so this draft is suitable to be used as a learning tool.

4) The results of the social care character load test

The results of the social care character load test of the draft teaching materials for students given by the respondents, namely teachers, it is known that each indicator of the social care character content gets an average score of 4.5 which can be interpreted as very good. These results can indicate that the content of the social care character in draft 1 of the developed learning tool is very good, so this draft is suitable to be used as a learning tool.

b. The results of the trial of the draft learning device to students

The large-scale trial was in the form of trials for fifth grade elementary school students which included students in 5 schools, namely SD IT Annida Purwokerto, MI Lukman Hakim Slawi, MIN 1 Tegal, MI Ma'arif NU Dawuhan Wetan and SD IT Harapan Bunda Purwokerto. From each school, 15 students were taken as research respondents. Testing for students is testing on teaching materials or learning modules for students which includes multiple intelligences and student character. The multiple intelligences charge covers aspects of naturalist intelligence, interpersonal intelligence and intrapersonal intelligence. The content of the student's character includes the character of students' social care.

Field trial 2 was still carried out during the COVID-19 pandemic, so face-to-face learning was carried out with a limited number of students. Testing on students is carried out with the following steps:

1) Conduct pre-test to students

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Pre-test was conducted on students to find out how the character of students' social care and intelligence which included intrapersonal, interpersonal and naturalist intelligence was at the beginning, namely before being given learning using draft learning modules or teaching materials developed. Pre-test is done by giving questionnaires to students to be answered. The questionnaire is a character questionnaire that contains the character of students' social care, and a multiple intelligences questionnaire that contains intrapersonal, interpersonal and naturalist intelligence. After the questionnaire is filled out, it is then submitted to the teacher to be assessed, and later it will be compared with the post test scores after learning has been carried out using a draft learning module or teaching materials developed.

2) Conducting learning activities for students

Class V teachers conduct learning activities for students using draft 1 learning modules or teaching materials for students that are developed. The teacher carries out learning activities according to the teacher's manual developed by the researcher. Student activity and student response during the learning process took place very well. All students are actively involved in the learning activities carried out by the teacher.

3) Conducting learning evaluation

The final part of the learning process is that the teacher evaluates learning to determine the extent to which the learning material can be absorbed or understood by students which can reflect the effectiveness of the draft learning module for students being applied as teaching materials for students in the field. Learning evaluation uses an evaluation instrument developed by the researcher. The evaluation instrument was carried out by students, then collected by the teacher to be corrected and assessed by the teacher.

4) Doing post test

Researchers conducted a post test to students to find out how the character of students' social care and intelligence which included intrapersonal, interpersonal and naturalist intelligence was at the end, namely after being given learning using draft learning modules or teaching materials developed by researchers. The post test was carried out by giving the same questionnaire to students to answer, namely a character questionnaire containing the character of students' social care, and a multiple intelligence questionnaire containing intrapersonal, interpersonal and naturalist intelligence. After the questionnaire is filled out, it is then handed over to the teacher to be assessed, and later it will be compared with the pre-test scores to find out whether there is an increase in the value that indicates an increase in character and an increase in intelligence in students.

The results of the learning evaluation, pre-test and post-test conducted to students are as follows:

1) Learning evaluation results

Learning evaluation is carried out at the end of each lesson on the completed sub-themes taught to students, using instruments developed by researchers in accordance with the material in each sub-theme. In draft 1, the learning module or student teaching materials developed by the researcher contains 3 sub-themes, so that the learning evaluation is carried out 3 times, namely in sub-theme 1, sub-theme 2 and sub-theme 3. The results of the evaluation of learning from all SD/MI used as a place for field test 2 or broad-scale test, it is known that the value of student learning evaluation results is high. The value of the results of the evaluation of student learning in sub-theme 1 is high, where the lowest score is 80 and the highest value is 100. The value of the results of the evaluation of student learning in sub-theme 2 is high, where many students get very high scores, namely 100. evaluation of student learning in sub-theme 3 is very high, where the lowest score is 90 as many as 10 students out of 75 students who become respondents, 17 students get a very high score, namely 95 and the remaining 48 students get the highest score, namely 100. sub-theme 3, which is the last sub-theme of the learning draft, most of the students got very high scores.

2) The results of the pre-test and post-test of the student's character

a) Student character pre test results

Pre-test is carried out before students receive learning using draft 1 of the learning module or teaching materials developed by researchers, where this draft is still used in large-scale field trials because in small-scale field tests there are no revisions. The pre-test questionnaire on character contains 20 items of questions/statements on the character of student social care consisting of positive and negative questions/statements. The questionnaire was compiled using a scale of 1-4 with a gradation of answers to positive questions/statements, namely strongly agree (SS) score 4, agree (S) score 3, disagree (KS) score 2, disagree (TS) score 1. While the gradation of answers on negative questions/statements, namely strongly agree (SS) score 1, agree (S) score 2, disagree (KS) score 3, disagree (TS) score 4.

After the pre-test was carried out to students at the school which was the place for a large-scale field trial, the results showed

The pretest of the character of social care and the character of students' creativity in the 5 SD/MI which has been presented in the tables above, it is known that all of them get an average score or score below the number 3 which can be interpreted as

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quite high. So it can be said that the students at 5 SD/MI which became the place for the wide trial had sufficient social awareness characters but still needed to be improved in order to have social awareness as expected.

b) Student character post test results

The post test is carried out after students receive learning using draft 1 of the learning module or teaching materials developed by the researcher. The post test questionnaire is the same as the questionnaire used for the pre test, which is about the character of students' social care which consists of positive and negative questions/statements, using a scale of 1- 4 with a gradation of answers to positive questions/statements, namely strongly agree (SS) score 4, agree (S) score 3, disagree (KS) score 2, disagree (TS) score 1. While the gradation of answers to negative questions/statements is strongly agree (SS) score 1, agree (S) score 2, disagree (KS) score 3, disagree (TS) score 4. After a post test was carried out on students at the school which was the place for a large-scale field trial, the results were shows that the character of students' social care after learning using draft learning modules or teaching materials developed by researchers averages a score above the number 3. ng can be said to be high, some even get an average value or score of 4 which means it is very high.

Based on the results of the post test of the social care character of students at the 5 SD/MI, it can be seen that all of them received an average score or score above 3 which can be said to be high, some even got an average score of 4 which means very high. So it can be said that the students at 5 SD/MI which became the place for the wide trial had the character of high social awareness as expected.

c) Differences in student character after learning with draft 1

After the pre-test and post-test were carried out on students, then an analysis of the data was carried out to find out whether there were significant differences in the social awareness data which indicated an increase in the character of students' social care after learning using draft 1 learning module or teaching materials developed by researchers. After analyzing the data using the pair sample test with the help of SPSS, the results are:

shows that students' interpersonal intelligence after learning using draft 1 learning modules or teaching materials developed by researchers obtained an average score above 3 which can be interpreted as high. Furthermore, for the naturalist intelligence of students after learning using draft 1 learning modules or teaching materials developed by researchers obtained an average score above number 3 which can be interpreted as high. And students' intrapersonal intelligence after learning using draft 1 learning modules or teaching materials developed by researchers obtained an average score above the number 3 which can be interpreted as high, some even get an average score of 4 which can be interpreted as very high.

3) Differences in students' multiple intelligences after learning with draft 1

After pre-test and post-test were conducted on students, then an analysis of the data was carried out to find out whether there were significant differences in the interpersonal, naturalist and intrapersonal intelligence data of students which indicated an increase in student intelligence after learning using draft 1 learning module or teaching materials developed. by researchers. After analyzing the data using the pair sample test with the help of SPSS, the results for each school are as follows:

(1) SD IT Annida different test

Table 9. Students' multiple intelligences t test results

<i>Multiple intelligences students</i>	t count	Sig.	Description
interpersonal post test - interpersonal pre test	51.000	0.000	Significantly different
post test naturalist - pre test naturalist	68.202	0.000	Significantly different
post test intrapersonal - pre test intrapersonal	53.500	0.000	Significantly different

From the table above, it is known that the t-count value from the results of the different interpersonal intelligence scores before learning using draft 1 (pre test) and after learning using draft 1 (post-test) is 51,000 greater than the t table, which is 2.131 with a significance value of 0.000 less than 0.05. These values indicate that the value of the interpersonal intelligence character after learning using draft 1 (post test) is significantly different or significantly different from the interpersonal intelligence of students before learning using draft 1 (pre test), where the post test value is higher than the pre test value.

The calculated t value from the results of the different naturalist intelligence scores before learning using draft 1 (pre test) and after learning using draft 1 (post test) is 68.202, which is greater than the t table, which is 2.131 with a significance value of 0.000 less than 0.05. These values indicate that the value of naturalist intelligence after learning using draft 1 (post test) is significantly different or significantly different from the naturalist intelligence of students before learning using draft 1 (pre test), where the post test value is higher than the pre test value.

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The t-count value from the test results of the difference between intrapersonal intelligence scores before learning with draft 1 (pre-test) and after learning using draft 1 (post-test) is 53.500, which is greater than the t-table, which is 2.131 with a significance value of 0.000 less than 0.05. These values indicate that the value of intrapersonal intelligence after learning using draft 1 (post test) is significantly different or significantly different from the intrapersonal intelligence of students before learning using draft 1 (pre test), where the post test value is higher than the pre test value.

MIT Lukman Hakim difference test

Table 10. Students' multiple intelligences t test results

<i>Multiple intelligences students</i>	t count	Sig.	Description
interpersonal post test - interpersonal pre test	40.564	0.000	Significantly different
post test naturalist - pre test naturalist	23.474	0.000	Significantly different
post test intrapersonal - pre test intrapersonal	38.711	0.000	Significantly different

From the table above, it is known that the t-count value from the test results of interpersonal intelligence scores before learning using draft 1 (pre-test) and after learning using draft 1 (post-test) is 40.564 which is greater than the t-table, which is 2.131 with a significance value of 0.000 smaller. of 0.05. These values indicate that the value of the interpersonal intelligence character after learning using draft 1 (post test) is significantly different or significantly different from the interpersonal intelligence of students before learning using draft 1 (pre test), where the post test value is higher than the pre test value.

The calculated t value from the results of the different naturalist intelligence scores before learning using draft 1 (pre test) and after learning using draft 1 (post test) is 23,474 which is greater than the t table, which is 2,131 with a significance value of 0.000 less than 0.05. These values indicate that the value of naturalist intelligence after learning using draft 1 (post test) is significantly different or significantly different from the naturalist intelligence of students before learning using draft 1 (pre test), where the post test value is higher than the pre test value.

The calculated t value from the results of the intrapersonal intelligence test before learning with draft 1 (pre test) and after learning using draft 1 (post test) is 38.711 which is greater than the t table which is 2.131 with a significance value of 0.000 less than 0.05. These values indicate that the value of intrapersonal intelligence after learning using draft 1 (post test) is significantly different or significantly different from the intrapersonal intelligence of students before learning using draft 1 (pre test), where the post test value is higher than the pre test value.

(3) Different test MIN 1 Tegal

Table 11. Students' multiple intelligences t test results

<i>Multiple intelligences students</i>	t count	Sig.	Description
interpersonal post test - interpersonal pre test	38.158	0.000	Significantly different
post test naturalist - pre test naturalist	3.436	0.004	Significantly different
post test intrapersonal - pre test intrapersonal	67.510	0.000	Significantly different

From the table above, it is known that the t-count value from the test results of interpersonal intelligence scores before learning using draft 1 (pre-test) and after learning using draft 1 (post-test) is 38.158, which is greater than the t-table, which is 2.131 with a significance value of 0.000 smaller. of 0.05. These values indicate that the value of the interpersonal intelligence character after learning using draft 1 (post test) is significantly different or significantly different from the interpersonal intelligence of students before learning using draft 1 (pre test), where the post test value is higher than the pre test value.

The calculated t value from the results of the different naturalist intelligence scores before learning using draft 1 (pre test) and after learning using draft 1 (post test) is 3,436, which is greater than the t table, which is 2.131 with a significance value of 0.004 less than 0.05. These values indicate that the value of naturalist intelligence after learning using draft 1 (post test) is significantly different or significantly different from the naturalist intelligence of students before learning using draft 1 (pre test), where the post test value is higher than the pre test value.

The calculated t value from the results of the intrapersonal intelligence test before learning with draft 1 (pre test) and after learning using draft 1 (post test) is 67.510, which is greater than the t table, which is 2.131 with a significance value of 0.000 less than 0.05. These values indicate that the value of intrapersonal intelligence after learning using draft 1 (post test) is significantly

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different or significantly different from the intrapersonal intelligence of students before learning using draft 1 (pre test), where the post test value is higher than the pre test value.

(4) different test MI Ma'arif NU Dawuhan Wetan's

Table 12. Students' multiple intelligences t test results

<i>Multiple intelligences students</i>	t count	Sig.	Description
interpersonal post test - interpersonal pre test	35.872	0.000	Significantly different
post test naturalist - pre test naturalist	27.812	0.000	Significantly different
post test intrapersonal - pre test intrapersonal	30.384	0.000	Significantly different

From the table above, it is known that the t-count value from the results of the different interpersonal intelligence scores before learning using draft 1 (pre-test) and after learning using draft 1 (post-test) is 35.872, which is greater than the t-table, which is 2.131 with a significance value of 0.000, which is smaller. of 0.05. These values indicate that the value of the interpersonal intelligence character after learning using draft 1 (post test) is significantly different or significantly different from the interpersonal intelligence of students before learning using draft 1 (pre test), where the post test value is higher than the pre test value.

The calculated t value from the results of the different naturalist intelligence tests before learning using draft 1 (pre test) and after learning using draft 1 (post test) is 27.812, which is greater than the t table, which is 2.131 with a significance value of 0.004 less than 0.05. These values indicate that the value of naturalist intelligence after learning using draft 1 (post test) is significantly different or significantly different from the naturalist intelligence of students before learning using draft 1 (pre test), where the post test value is higher than the pre test value.

The calculated t value from the results of the intrapersonal intelligence test before learning with draft 1 (pre test) and after learning using draft 1 (post test) is 30.384 which is greater than the t table which is 2.131 with a significance value of 0.000 less than 0.05. These values indicate that the value of intrapersonal intelligence after learning using draft 1 (post test) is significantly different or significantly different from the intrapersonal intelligence of students before learning using draft 1 (pre test), where the post test value is higher than the pre test value.

(5) Different test for SD IT Harapan Bunda

Table 13. Students' multiple intelligences t test results

<i>Multiple intelligences students</i>	t count	Sig.	Description
interpersonal post test - interpersonal pre test	63.228	0.000	Significantly different
post test naturalist - pre test naturalist	40.817	0.000	Significantly different
post test intrapersonal - pre test intrapersonal	34.785	0.000	Significantly different

From the table above, it is known that the t-count value from the results of the different interpersonal intelligence tests before learning using draft 1 (pre-test) and after learning using draft 1 (post-test) is 63,228, which is greater than the t-table, which is 2.131 with a significance value of 0.000 smaller. of 0.05. These values indicate that the value of the interpersonal intelligence character after learning using draft 1 (posttest) is significantly different or significantly different from the interpersonal intelligence of students before learning using draft 1 (pretest), where the post test value is higher than the pre test value.

The calculated t value from the results of the different naturalist intelligence scores before learning using draft 1 (pre test) and after learning using draft 1 (post test) is 40.817, which is greater than the t table, which is 2.131 with a significance value of 0.004 less than 0.05. These values indicate that the value of naturalist intelligence after learning using draft 1 (post test) is significantly different or significantly different from the naturalist intelligence of students before learning using draft 1 (pre test), where the post test value is higher than the pre test value.

The calculated t value from the results of the intrapersonal intelligence test before learning with draft 1 (pre test) and after learning using draft 1 (post test) is 34.785, which is greater than the t table, which is 2.131 with a significance value of 0.000 less than 0.05. These values indicate that the value of intrapersonal intelligence after learning using draft 1 (post test) is significantly different or significantly different from the intrapersonal intelligence of students before learning using draft 1 (pre test), where the post test value is higher than the pre test value.

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Based on the results of trials on a wide scale which includes individual tests to 10 teachers from 5 SD/MI and to students in 5 SD/MI schools each as many as 15 students so that there are 75 students in class V SD/MI as described above. , the results of the feasibility test of the draft 1 learning device that previously had passed the field test on a limited scale without revision so that it was continued with this 2nd field test, which was declared feasible both in terms of presentation, content and language, the content of social care characters and the content of interpersonal intelligence, naturalist and intrapersonal. Furthermore, the test results in a wider group given to students, obtained student learning outcomes using draft 1 learning module or teaching materials for students is high. The value of the post test results of students' character and multiple intelligences is also higher than the value of the pretest results of students' character and multiple intelligences, and after a different test or t test on the student's character and multiple intelligences, the results are significantly different. The results of the t-test indicate that draft 1 learning module or teaching materials for students developed by researchers can improve student character tests and multiple intelligences (interpersonal, naturalist and intrapersonal). Based on these results, the draft 1 of the multiple intelligences-based learning device developed by the researcher is declared suitable for use in learning and does not need to be revised.

CONCLUSION

Multiple intelligences-based learning tools that are feasible to improve the social awareness character of fifth grade elementary school students are produced through several stages, namely the preliminary research stage to obtain information, identify and solve problems regarding the character of social care for elementary school students, then the stage of making the initial draft of the device. multiple intelligences-based learning, then the feasibility test phase is carried out 3 (three) times, namely testing by experts, individual and small group tests (field test 1) and large-scale field testing.

Draft 1 of the learning device developed by the researcher is the final product of the researcher, because after a small-scale test and a wide-scale test it is declared feasible to use and there is no need for revision or improvement. The final product includes a teacher's manual or lesson plans and learning modules, or teaching materials for fifth grade elementary school students using the 2013 curriculum. This final product contains one learning theme, namely theme 3 with the theme of healthy food.

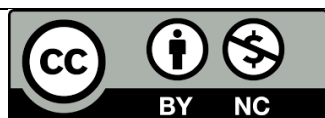
The results of this study can be said that research and development carried out by researchers have produced learning tools based on multiple intelligences (interpersonal, intrapersonal and naturalist intelligences) that are worthy of increasing the character of social awareness of fifth grade elementary school students. And then the draft of learning tools developed by researchers can be used in learning in SD/MI.

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The Effect of Relay Exercise of 30 Meters and Relays of 40 Meters on Increasing Maximum Aerobic Capacity (VO2 Max) Badminton Players of PB Jaya Raya Satria



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ABSTRACT: This study aims to determine the effect of exercise R 30 and R 40 on increasing VO2 Max badminton players PB Jaya Raya Satria. This study uses an experimental method with a "two groups pre-test-post-test design" design. The population in this study were PB badminton players. Jaya Raya Satria, totaling 18 people. Sampling in this study was done by random sampling, totaling 16 male athletes. The instrument used is a multistage fitness test. This test has a validity of 0.72 and a reliability of 0.81. Data analysis used t-test with a significance level of 5%. The results showed that (1) There was a significant effect of R 30 training on increasing VO2 Max of badminton players PB Jaya Raya Satria, with a t-count value of 8.571 > t-table 2.365, and a significance value of 0.000 < 0.05. (2) There is a significant effect of R 40 training on increasing VO2 Max of badminton players PB Jaya Raya Satria, with a t-count value of 5.835 > t-table 2.365, and a significance value of 0.001 < 0.05. (3) There is no significant difference between exercise R 30 and R 40 on the increase in VO2 Max of badminton players PB Jaya Raya Satria, with a t-count value of 0.041 < t table = 2.145 and sig, 0.968 > 0.05.

KEYWORDS: relay distance 30 meters, 40 meters, VO2 Max

INTRODUCTION

Badminton is a sport game. Badminton can be played by all walks of life, from children, teenagers to adults. Both men and women can play badminton. Therefore, badminton provides a real role in the life of the wider community. Badminton in Indonesia has been known for a long time, so badminton is a sport that is quite popular among the people of Indonesia. Badminton is an individual game, and can be played by one person against one person, or two people against two people. This game uses a racket as a bat and a cock as a subject to be hit (Pratomo, Sugiharto, & Subiyono, 2013: 1). There are several components that determine the achievement of high achievement in achievement sports, namely the state of sports facilities, the state of the competition, the psychological state of the athlete, the state of the athlete's skill ability, the state of the athlete's physical ability, the state of the body constitution and the state of tactical/strategic ability (Irwanto & Romas, 2019): 1).

Physical ability is one of the most dominant components in achieving sports achievements. Sports achievements will not be separated from the elements of physical condition, technique and tactics. An athlete really needs the quality of strength, endurance, flexibility, speed, agility, and good movement coordination. These aspects are needed to be able to move and react well during the game. Physical and technical development are training programs that are the main targets in the formation of skilled badminton. As stated by Poole (2008: 129), that "exercise aims to make the body in a fit condition, because the strokes made in the badminton game will not be useful enough if it is not followed by developed conditioning". Through a well-programmed physical training process,

Based on the author's observations and observations from PB Jaya Raya Satria on December 20-27, 2019 the players did not have good enough stamina, so almost every match experienced fatigue. Of all the athletes who did the exercise, it seemed that they were tired so that their performance while playing was getting worse when the athlete hit lobs and smashes. Some of the athletes interviewed admitted that they experienced fatigue during training. This can also be seen when competing in the first set is still stable, but in the second set the athletes are already experiencing fatigue, so that the athlete's concentration on the match is not good. In addition to technical factors, this is also influenced by energy to increase the ability of the whole body to

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always move at a moderate to fast tempo, which is quite long. So far, the training at Jaya Raya Satria has also focused more on technical training, such as smash and other hitting techniques. Less exercise that leads to physical exercise, especially aerobic endurance. The exercise applied in this study is the R 30 and 40 meter exercise method. Relay training (relay running), is a continuous run or relay race is one of the running race numbers in athletic competitions which are carried out alternately or in chains.

Aerobic endurance is a very important physical factor, which determines the achievement of an athlete, because good endurance an athlete will be able to apply techniques and tactics to the maximum, so that with excellent endurance abilities the opportunity to achieve achievements will be easier. The main factor of success in training and sports competitions is influenced by the level of the athlete's endurance ability, so a person's good endurance ability will be able to do his job to the fullest. Good physical endurance is the maximum ability to meet oxygen consumption which is indicated by the maximum oxygen volume level (VO2 Max). VO2 Max is the maximum amount of oxygen in milliliters that can be used in one minute per kilogram of body weight. Based on the background that has been stated above, the researchers are interested in conducting research with the title "The Effect of 30 Meter Relay Exercise and 40 Meter Relay on Increasing VO2 Max of Badminton Players PB Jaya Raya Satria".

METHODS

This type of research is a quasi-experimental research. According to Arikunto (2016: 272) experimental research is research that is intended to determine whether or not there are consequences for the subject who is subjected to treatment. The research design used was "two groups pre-test-post-test design", This research was conducted in PB. Jaya Raya Satria. The study was carried out on January 27-7 February 2020. This research was conducted 16 times face to face conducted 3 times in 1 week, namely on Monday, Wednesday, and Friday. The exercise is Exercise R 30, which is a form of running exercise consisting of four people with a distance of 30 meters. Exercises are carried out with an intensity of 80%, 30 repetitions, 1 minute recovery, 3 minute intervals, and increasing sets every week. The exercise was carried out for 16 meetings. Likewise with the R 40 exercise, which is a form of running exercise consisting of four people with a distance of 40 meters. Exercises are carried out with an intensity of 80%, 40 repetitions, 1 minute recovery, 3 minute intervals, and increasing sets every week.

The exercise was carried out for 16 meetings. The population in this study were PB badminton players. Jaya Raya Satria, totaling 18 people. Sampling in this study was done by random sampling, amounting to 16 male athletes. Group A was treated with the R 30 exercise method and group B was given the R 40 exercise method. The instrument in this study was a multistage fitness test. This test has a validity of 0.72 and a reliability of 0.81 (Sukadiyanto, 2011: 39). The multistage running test is a test by running back and forth over a distance of 20 meters (Sukadiyanto, 2011: 49). The instrument in this study is a multistage fitness test. This test has a validity of 0.72 and a reliability of 0.81 (Sukadiyanto, 2011: 39). The multistage running test is a test by running back and forth over a distance of 20 meters (Sukadiyanto, 2011: 49). The instrument in this study is a multistage fitness test. This test has a validity of 0.72 and a reliability of 0.81 (Sukadiyanto, 2011: 39). The multistage running test is a test by running back and forth over a distance of 20 meters (Sukadiyanto, 2011: 49). The data that will be collected in this study is pre-test data obtained from the number of athletes' abilities to perform multistage fitness test tests before the sample is given treatment, while post-test data will be obtained from the number of athletes' abilities to perform multistage fitness tests after the sample is treated. Furthermore, the research must meet several criteria, namely, normality test, homogeneity test and hypothesis testing.

RESEARCH RESULTS

The sample in this study were PB Jaya Raya Satria badminton players, totaling 16 athletes. The description of the sample in this study is presented in the following table:

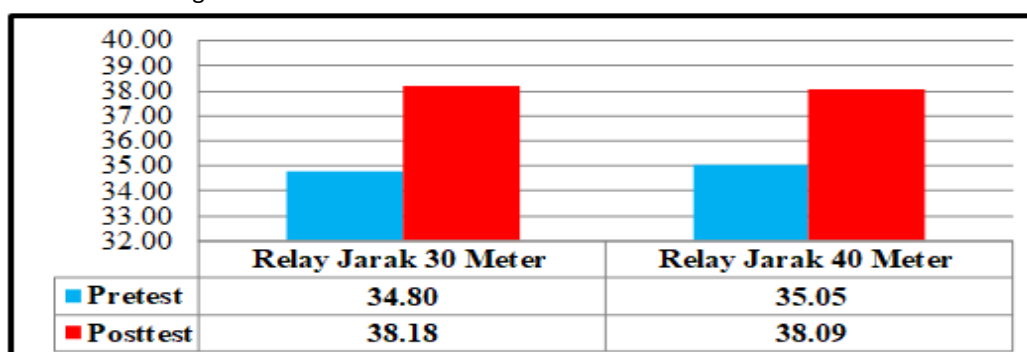


Figure 1. Bar Diagram of Pretest and Posttest VO2 Max Exercise Groups R 30 (A) and R 40 (B)

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From the data above, to make it clearer the difference between the pretest and posttest VO2 Max badminton players PB Jaya Raya Satria training group R 30 (A) and R 40 (B)

Table 1. Summary of Normality Test Results

Group	<i>p</i>	Sig.	Description
PretestGroup A	0.933	0.05	Normal
PosttestGroup A	0.987	0.05	Normal
PretestGroup B	0.780	0.05	Normal
PosttestGroup B	0.880	0.05	Normal

From the results of table 1 above, it can be seen that all data have a *p* value (Sig.) > 0.05, so the variables are normally distributed. Since all data are normally distributed, the analysis can be continued with parametric statistics.

Table 2. Summary of Homogeneity Test Results

Group	df1	df2	Sig.	Description
Pretest	1	14	0.656	Homogeneous
Posttest	1	14	0.888	Homogeneous

From table 2 above, it can be seen that the pretest-posttest values of sig. *p* > 0.05 so the data is homogeneous. Because all data are homogeneous, data analysis can be continued with parametric statistics

Hypothesis Test Results

The hypothesis in this study was tested using paired t test and independent t test using SPSS 20, the results of hypothesis testing are as follows:

Table 3. T-test Results of Pretest and Posttest VO2 Max Exercise Group R 30

Group	Average	Paired Samples Test				
		t ht	t tb	Sig.	Difference	%
Pretest	34.80	8,571	2,365	0.000	3.38	9.71%
Posttest	38.18					

From the results of the t-test in table 3 above, it can be seen that the t-count is 8.571 and the t-table (df 7) is 2.365 with a *p* significance value of 0.000. Because the t count is 8.571 > t table 2.365, and the significance value is 0.000 < 0.05, this result shows that there is a significant difference. Thus the alternative hypothesis (*H_a*) which reads "There is a significant effect of R 30 exercise on increasing VO2 Max of badminton players PB Jaya Raya Satria", is accepted.

Table 4. T-Test Results of Pretest and Posttest VO2 Max Exercise Group R 40

Group	Average	Paired Samples Test				
		t ht	t tb	Sig.	Difference	%
Pretest	35.05	5,835	2,365	0.001	3.04	8.67%
Posttest	38.09					

From the results of the t-test in table 4 above, it can be seen that the t count is 5.835 and the t table (df 7) is 2.365 with a *p* significance value of 0.001. Because t count 5.835 > t table 2.365, and a significance value of 0.001 < 0.05, this result indicates that there is a significant difference. Thus the alternative hypothesis (*H_a*) which reads "There is a significant effect of R 40 exercise on increasing VO2 Max of badminton players of PB Jaya Raya Satria", is accepted.

Table 5. VO2 Max t-test for the R 30 (A) and R 40 (B) exercise groups

Practice Group	Percentage	Independent Samples Test			
		t ht	t tb	sig,	Difference
R30	9.71%	0.041	2.145	0.968	0.087
R 40	8.67%				

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From the table of t-test results in table 13 above, it can be seen that the t-count is 0.041 and the t-table ($df = 14$) = 2.145, while the significance value of p is 0.968. Because t arithmetic $0.041 < t$ table = 2.145 and sig, $0.968 > 0.05$, it means that there is no significant difference. Thus, the null hypothesis (H_0) which reads “There is no significant difference between the R 30 and 40 meters training on increasing the VO2 Max of badminton players PB Jaya Raya Satria, is accepted. Based on this, it shows that there is no significant difference between the R 30 and R 40 exercises on the increase in VO2 Max of badminton players PB Jaya Raya Satria.

DISCUSSION

Based on the t-test analysis conducted, several things can be known to draw conclusions. The research results are discussed in detail as follows:

1. The effect of R 30 exercise on increasing VO2 Max

Based on the results of the study, it showed that there was a significant effect of R 30 exercise on increasing the VO2 Max of badminton players of PB Jaya Raya Satria, which was 9.71%. Supported by the results of Permana et al (2018: 1) research showing that the speed of students has increased from before being given speed training (file relay) this is evidenced by the tcount value of 9,345 which is greater than the ttable value of 1,833. It can be said that this speed exercise (file relay) is very suitable to be given to students in order to increase their speed, so that students can improve their achievements in basketball extracurricular activities. Relay exercise used in this study includes training with the type of interval training. Interval training is very influential on VO2 Max as long as it is still in the correct portion and conditions. The applicable provisions must also be observed carefully to avoid overtraining. Interval training is an important way of including training in an overall training program. According to Bompa & Haff (2015: 69), 1:3 interval training is done by running at an optimal speed of 30 meters then the travel time will be multiplied by 3 for the rest time. Athletes are required to rest completely without doing activities. After the rest period is over, the athlete immediately repeats the 30-meter run and is repeated continuously for the specified repetitions.

Over the last few decades, interval training has become one of the most common physical conditioning methods used in endurance sports (Pandey & Verma, 2016: 134). Although interval training is considered to be able to increase the endurance of athletes, this method requires manipulation in terms of distance, duration, repetition, rest time, and actions at rest to suit certain sports (Turner & Stewart, 2014: 11). Deol & Singh (2013: 1) showed that interval training significantly increased aerobic capacity. Pattyn et al. (2017: 329) explains that aerobic interval training and continuous training increase the oxygen uptake capacity in the body, thus automatically increasing aerobic endurance significantly with an exercise program for 6 weeks. Interval training is the most versatile method of increasing endurance. Interval training is carried out with higher intensity with complete rest periods. Previous research has shown that small sided games and interval training (generic running, continuous training, and high intensity interval training) are effective in increasing aerobic endurance in professional soccer players. Harsono (2015: 156) reveals "interval training is an exercise system that is interspersed with intervals in the form of periods of rest".

Interval training is widely used in the field of sports training and consists of repetitions followed by rest intervals with complete or incomplete recovery depending on the goals of the sports training. Since the recovery period provides time for physiological adaptation, duration is a very important part of interval training. A very short recovery period does not allow the body to recover enough to perform the next interval of work at the desired intensity. On the other hand, a very long recovery period allows the body to recover too much and some of the training effect will be lost. The duration of the recovery period depends on the length of the work interval and the specific energy system being trained. During the process of sports training, there are changes in one or another biomotor or physiological variable of the athlete. Interval training can be an effective way of increasing an athlete's lactate threshold, i.e. increasing the threshold at which lactate starts to build up in the blood. Lactate threshold has been shown to be a significant performance determinant for long-distance running events. that is, increasing the threshold at which lactate begins to build up in the blood. Lactate threshold has been shown to be a significant performance determinant for long-distance running events. that is, increasing the threshold at which lactate begins to build up in the blood. Lactate threshold has been shown to be a significant performance determinant for long-distance running events.

2. The effect of R 40 exercise on increasing VO2 Max

Based on the results of the study, it showed that there was a significant effect of R 40 exercise on increasing VO2 Max of badminton players of PB Jaya Raya Satria, which was 8.67%. Interval training is very appropriate to improve physical quality. According to Sukadiyanto (2011: 65), the interval training method is the right method in improving the physical condition of

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athletes. Interval training prioritizes giving intervals (rest) between sets, with activities such as running and/or swimming. For example, interval training can be done by running – resting – running – resting and so on. This happens because the interval training program used is in accordance with the recommendations of Bompa & Haff (2015: 143), namely the training method that is included in the aerobic interval training. This interval training method predominantly uses the aerobic energy system, so it is in accordance with the objectives of this study. Deol & Singh (2013: 2) showed that interval training significantly increases aerobic capacity. These results indicate that this method positively improves aerobic endurance ability after the initial and final tests. Indrayana (2012: 1) states that the advantages of interval training are being able to know the exact load, being able to see progress faster (increasing energy and conditions that can be done efficiently) ”.

This interval method has several advantages for both the coach and the athlete. The purpose of rest intervals is for recovery after doing work. Recovery is required after doing high-intensity work during exercise. Having a rest or recovery interval between work has several benefits or advantages. Rest periods are very important between workouts. Rest periods provide an opportunity for athletes to recover between repetitions of motion. Recovery is done after doing work or high-intensity exercise during exercise. In its implementation, the athlete does the number of swimming according to the instructions from the coach and at a certain time the athlete is given the opportunity to rest. The rest given can be used for relaxation or given correction from the coach. Thus the athlete's condition will recover, besides being able to recognize or observe the time limit when doing swimming, so that on the next occasion the athlete's time limit is included in the training program made by the coach.

3. Comparison of exercise R 30 and R 40 to increase VO2 Max

Based on the results of the analysis, it shows that there is no significant difference between exercise R 30 and R 40 on the increase in VO2 Max of badminton players PB Jaya Raya Satria, with a t count value of $0.041 < t_{table} = 2.145$ and $sig, 0.968 > 0.05$. This means that both types of exercise can increase the VO2 Max of badminton players PB Jaya Raya Satria. This is in accordance with the opinion of Bompa & Haff (2015: 51), that training given regularly for 6-8 weeks will get certain results where the body adapts to the given training. VO2 Max closely related to cardiovascular endurance.³ The amount of individual VO2 Max can be measured from the amount of movement ability performed. The ability to move is the result of the body's ability to produce energy that comes from exercise or called metabolism and the supply of oxygen obtained by the muscles to contract. The body's ability to produce energy occurs through anaerobic mechanisms (without using O₂) and aerobic mechanisms (using O₂). The heavier the intensity of the movement, the greater the need for oxygen in the body. The need for oxygen in the body due to the intensity of movement causes the body to compensate with an increase in the cardiovascular system, namely an increase in heart rate, dilatation of coronary blood vessels, an increase in stroke volume and an increase in the strength of heart contractions, this causes an increase in stroke volume. The body that experiences an increase in VO2 Max adapts to the contraction of the heart during exercise. The increase in the effectiveness of the heart pump after being given a continuous and physiologically continuous training load causes the heart muscle to adapt so that the strength of the heart in pumping blood increases more than before exercise. The performance of the heart becomes better so it can provide sufficient oxygen supply throughout the body, which can be measured by measuring the pulse after exercise.

The effect of exercise on blood volume depends on the type of training, intensity, conditions and acclimatization in an area. Athletes who are able to pump most of their blood to working muscles during training will have a very large difference in arterial and venous blood content, because active muscles will absorb more oxygen from the blood than inactive tissues. To achieve good performance, good physical conditions are also needed, not apart from adequate preparation and physicality, it will be very difficult to develop training towards a good VO2 Max. Johe, (2013: 2) regarding VO2 Max stated that, “VO2 Max (also maximal oxygen consumption, maximal oxygen uptake, peak oxygen uptake, or maximal aerobic capacity) is the maximum capacity of an individual's body to transmit through the circulatory system and use oxygen in motor muscles.” Foster et al. (2015: 747) revealed that interval training programs can be adapted for almost every population and can be done anywhere at any time. Depending on individual abilities, the trainer can manipulate the intensity and duration of intervals, exercise modalities, sets and repetitions, and the intensity and duration of recovery between sets. In general, the duration of the interval is the main variable being manipulated. The relatively high intensity paired with the short recovery interval is considered very demanding. In contrast, low intensity is paired with long recovery intervals. This high-intensity interval training consists of a period of doing high-intensity sprints interspersed with a rest period, namely jogging, the treatment causes the body to effectively form and use energy from the anaerobic system. The addition of intervals helps remove metabolism from the muscles during periods of rest when high-intensity interval training is being performed by the body. These alternating exercise periods help the body increase the volume of oxygen consumed during exercise at maximum volume and capacity (VO2 Max) during exercise. Increased cardiovascular also occurs due to an increase in heart rate during exercise. An increase in heart rate

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during this exercise increases stroke volume. An increase in stroke volume and an increase in heart rate can cause an increase in cardiac output, which is the volume of blood ejected by the two ventricles per minute. This increase is accompanied by vasodilation of blood vessels to carry oxygen to active muscles (Willmore, et al. 2012: 39).

High-intensity training causes an increase in stroke volume so that there is a decrease in pulse rate while cardiac output remains, it is due to the efficiency of the heart muscle in supplying blood throughout the body. Heart rate efficiency is indicated by a decrease in pulse rate. Low-intensity exercise alternating between high-intensity exercise at interval training helps the body to remove metabolism from the muscles during periods of rest when high-intensity interval training is being performed by the body. These alternating exercise periods help the body increase the volume of oxygen consumed during exercise. Oxygen that goes to this active muscle breaks down lactic acid into energy again. 4 According to a study on high-intensity interval training conducted by Oliveira et al, Like other aerobic exercises, this high-intensity interval training improves muscle cell function, burns fat and increases lung capacity. 30 minutes of high-intensity interval training equals 90 minutes of low-intensity exercise. So that high-intensity interval training takes a shorter time to achieve fitness benefits (Hoeger & Hoeger, 2014: 58). The greater the VO₂ Max, the more efficient the respiratory system. (Chatterjee, 2015: 3), “higher oxygen consumption of an individual shows her/him more efficient cardio respiratory system”. Oxygen is one of the fuels needed by humans and one of the components needed by muscles for heavy or light activities. Every sport requires VO₂ Max to support in the match. One of the sports that require VO₂ Max is badminton.

In line with the above opinion, Nala (2011: 37), states that the training provided systematically, progressively and repeatedly will improve the body's organ systems so that physical appearance will be optimal. The training, which is done with a frequency of three times a week, is suitable for beginners and will result in significant improvements. Physical training that is applied regularly and measurably with sufficient doses and time, will cause changes in the ability to produce greater energy and improve physical appearance. Movements performed during exercise in a repetitive way will lead to the formation of conditional reflexes, learning to move, and the process of memorizing motion (Nala, 2011: 39). This research has been carried out to the maximum extent possible. however, it cannot be separated from the existing limitations, namely: 1) The sample is not in a dormitory so it is possible that there are those who practice alone outside of treatment; 2) In this study, very few subjects were studied, namely only badminton athletes at PB Jaya Raya Satria, totaling 16 athletes.

CONCLUSIONS

The exercises used in this study include training with the type of interval training. Interval training is very influential on VO₂ Max as long as it is still in the correct portion and conditions. The applicable provisions must also be observed carefully to avoid overtraining.

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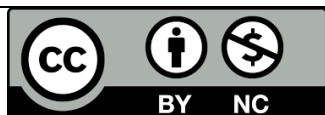
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The Impact of Parental Child–Rearing Style on School Attendance



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ABSTRACT: The study was a descriptive survey carried out to find the effect of parental child-rearing style on school attendance of Junior High School students in the Sefwi Wiawso Municipality. A sample of 340 students reported on their parents' parenting style using Parental Authority Questionnaire. A record of school attendance was taken from students' school attendance registers from sampled schools. Multiple Regression analysis was conducted to assess the effects of parenting style school attendance. The result showed that authoritarian parenting style predicted negatively with school attendance. Also, the authoritative parenting style has a positive prediction for school attendance. Implications, limitations, and future research opportunities are discussed. Parenting style played an important role in influencing the level of a child's school attendance.

KEYWORDS: Parenting Style, Authoritative, Authoritarian, Permissive, School Attendance

INTRODUCTION

Nothing stirs adults' emotions or captures their attention quite like the birth of a child (Bornstein, 2002). Psychologists, sociologists, educators, and policymakers who study children and development have long viewed parenting and the family as the most significant influence on the developing child (Bjorklund, Younger & Pallegirin, 2002). Parenting is critical not only for humans, but also for the survival of numerous animal and bird species. In the long-debated and still contentious nature-nurture dichotomy, parenting has traditionally been viewed as a significant source of environmental variability (Bjorklund et al., 2002). As a result, the parents' role becomes paramount in the existence of any progeny.

Parenting practise refers to the culturally prescribed routines of child care and child training that the child's caregiver follows (Edward, Knoche, Aukrust & Kim, 2005). The significance of this explanation of parenting practises is that almost every society has a set of culturally accepted routines for training children. As a result, these practises are prevalent among all parents in society. Parents, on the other hand, defer to their culture's standards when it comes to child rearing. Thus, the distinction in child rearing is in the manner in which these culturally established practises are implemented. In Ghana, for example, it is considered acceptable for children to perform household chores such as dishwashing and fetching water for domestic use. Every parent wishes to adhere to these practises to the letter in order to avoid their children being labelled as wayward in society. The question that occasionally crosses one's mind is why some children of different parents in the same community are regarded as well behaved while others are not. Certainly, the approach to child rearing is the answer. It is a method of child rearing that increases the likelihood of a child developing into the acceptable and capable individual society desires (Alvy, 2007).

The approach to child rearing varies according to the parent's style, from emotional support to verbal give-and-take situations. According to Lightfoot, Cole, and Cole (2009), parenting style is a term that refers to parents' behaviours and strategies for controlling and socialising their children. The term originated with Baumrind's (1971) study of parents and children, which concluded that parents raise their children in one of three styles. Darling and Steinberg (1993) assert that the distinction between parenting style and parenting practise is in the developmental outcomes sought. Darling and Steinberg argue that parenting practise has a direct effect on specific child developmental outcomes, whereas parenting style has a moderating effect on the relationship between parenting practise and developmental outcomes. Thus, child rearing practises must be moderated in order to provide the desired socialisation goals and competencies that boost a child's self-esteem and, as a result, interest in school attendance.

In recent years, some parents have been confronted with the daunting task of balancing career and the responsibility of raising children who exhibit societally acceptable behaviours. This rather difficult situation forces parents to relegate their critical role of parenting to a level that begs for culturally – established forms of child rearing. Naturally, interactions between mothers and

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children provide the rewarding security necessary for children to begin developing their self-concept and self-identity. Additionally, the situation in Sefwi – Wiaws appears to indicate that some parents prioritise their career over their child's developmental needs. While it is every parent's joy to see their child develop into a competent and capable member of society, there is no such magic wand. The only magic bullet capable of transforming a teenager's life would be a pill laced with self-esteem (Katz, 2000). As a result, parents face an extremely demanding and difficult task of child rearing. Unfortunately, children do not arrive in the world with a manual to guide them (Reynolds, 2010). Child rearing is a difficult and emotional experience that every parent must endure in order to shape the child's future image (Ipatenco, 2010). Negative beliefs about ourselves can develop as a result of our inherited experiences from childhood. According to experts, the parenting style adopted by parents has an effect on their children's emotional, cognitive, and behavioural development (Maier, 2012). To put it mildly, the emotional impact of parenting style on the child can be devastating. This may result in a child's low or high self-esteem and may have an effect on his or her academic achievement as a result of poor school attendance.

Regular attendance at school is a critical factor in academic achievement. Every parent wishes for their children to succeed in school. The child's attitude toward school can be either positive or negative. The ability of a child to attend school regularly or irregularly is highly dependent on his or her motivation. The motivation of a child can be intrinsic or extrinsic, depending on the motivation. Internal motivation, according to Grolnick and Farkas (2002), is self-regulated. To activate this internal motivation, the child requires autonomy, competence, and relationships with other significant individuals. To develop autonomy in a child, positive self-experience is required that fosters the belief that one can initiate one's own action. Competence, on the other hand, is the sense of being effective in one's interactions with one's environment. The desire to feel connected to significant others is a critical factor in intrinsically motivating the child (Grolnick & Farkas 2002). According to Rumberger (1995), motivation can also come from factors such as the school environment's quality, the teacher-student relationship, and the staff's quality and effectiveness. In light of these motivational issues, the parent's ability to effectively moderate the development of competence, aided by the provision of emotional autonomy, will enable the child to achieve the self-regulation Grolnick and Farkas discussed.

Reid (2008) observed that students who face domestic difficulties are more likely to dislike school than their peers who receive parental love and support. Self-experience and a lack of concept in children may be the result of a poor home environment. These factors may contribute to behavioural and psychological difficulties. Students who have negative self-experiences are more likely to miss school than students who have positive self-experiences. Teasley (2004) asserted that the family structure, parent–child relationship, and parental school involvement all played a role in school absenteeism. The child must be motivated to succeed in school.

Parenting

Parenting is important not only to humans, but central to the survival of many species of animals and birds. In an attempt to investigate the history of parenting, according to French (2002), the Greeks were the first to consider parenting and child development systematically. He added, however, that the Greeks and Romans viewed parenting as the result of nurturing, as well as the requirement for parents to invest time, energy, and resources appropriate to the child's developmental stage. In the long-debated and still contentious nature-nurture dichotomy, parenting has traditionally been viewed as a significant source of environmental variability (Bjorklund et al., 2002). Rothbaum, Pott, Miyake, and Moreili (2000) observed that parents are expected to respond sensitively to their children's needs in response to an explicit signal from the child. This, they stated, could be due to cultural influences. As a result, the parents' role becomes paramount in the existence of any progeny. This section will discuss human parenting. The survival of an infant is entirely dependent on its parents. According to the Microsoft Encarta dictionary for students (2009), parenting is the experiences, skills, characteristics, and responsibilities associated with being a parent and teaching and caring for a child. Parenting is a sacred and permanent responsibility that parents prepare their children for (Bornstein, 2002). It is the primary functional state of a human being throughout his or her life. Bjorklund et al. (2002) argued that parenting in humans, unlike other species, has been elevated to a new level due to our children's extended period of immaturity in comparison to other species. A parent's role is to guide and nurture all aspects of their child's development, including social, emotional, cognitive, and educational development. Parents serve as the primary role models and educators, guidance counsellors, and nurturers for their children.

Authoritarian Parenting Style

According to Baumrind, authoritarian parents are demanding and directive but unresponsive. This style is characterised by a lack of warmth, a high level of conflict, and attempts at coercive and punitive control (Rowntree, 2007). Parents are neither receptive nor warm toward their children. They place a high premium on their children's maturity, primarily because they are intolerant of selfish or inappropriate behaviour. They are obedient and concerned with their status, and expect their commands to be followed without explanation.

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Authoritative Parenting Style

The authoritative parenting style is characterised by a high degree of warmth and a high degree of exigency in the relationship between the parent and the child (Asheikh, et al., 2010). Positive or assertive control is also present, and parents have high expectations of their adolescents (Rowntree, 2007). Parents are both obnoxious and receptive. They supervise and instil clear expectations for their children's behaviour (Baumrind, 1991). Parents can be abrasive or repressive. Their method of discipline is more supportive than punitive. They desire assertive children who are also socially responsible, self-regulated, and cooperative. Children raised in this manner develop a positive image of themselves because they are given the opportunity to participate in their own education.

Permissive Parenting Style

Under the permissive parenting, the relationship between the parent and the child is characterized by high warmth and low demandingness (Darling & Steinberg, 1993). Baumrind described parents under this parenting style as non-directional and lenient, they do not require mature behaviour, allow considerable self-regulation, and avoid confrontations with their children. Children brought up under this type of practice, have too much freedom to operate without regulation.

Parenting style and School Attendance

The family and school both contribute significantly to the socialisation and education of the child (Epstein & Sander, 2002). The child's first education begins at home, with the parents serving as role models (Bandura 1977). There is no doubt that a symbiotic relationship exists between the school and the home, in which one's actions influence the outcome of the other. It is not for nothing that there is a strong advocacy for effective Parent-Teacher Associations (PTAs) in Ghana's Basic and Second Cycle institutions, but to foster a cordial school-home relationship in order to maximise a child's academic success. At the heart of academic success is a child's rate of school attendance. Cornville-Smith, Ryan, Adams, and Dalicandro (1998) observed that family relationships play a significant role in a child's school attendance in a study to distinguish absentee students from regular attendees. Epstein and Sheldon (2007) found that a positive school–family relationship predicted an increase in a child's daily attendance at school. The child's socioemotional adjustment in school will motivate him or her to develop the necessary interest in attending school. In a study published in 2012, Shobola, Omoregbe, and Olufemi discovered a positive correlation between pupils' school attendance and an authoritative parenting style. Brill (2009), on the other hand, found no evidence of a positive correlation between permissive parenting style and child school refusal. As Ang and Goh (2006) discovered in their investigation of Asian society to determine the effect of authoritarian parenting on children, authoritarian parenting nurtured children who were less delinquent and performed better in social competence. According to Okorodudu (2010), contrary to the widespread belief that authoritarian parenting styles are a good predictor of child delinquency, authoritarian and authoritative parenting styles cannot predict adolescent delinquency. Hocking (2008), in a study, identified factors that he termed "parentally condoned absence" as being responsible for school absenteeism. These factors included a lack of value for education, domestic problems, and inconsistent to inadequate parenting.

Statement of the Problem

Everyone needs significant others who will endorse one's selfhood, people who scaffold a sense that one's self matters and that one's efforts can produce results. Parents provide this critical environment for children to develop through the influence of parenting processes and the quality of parent-child relationships. When parents, through their style of parenting fail to satisfy this requirement for children to develop an appropriate visceral sense of the self, children are highly likely to develop low self-esteem which will consequently affect their school attendance.

Continuously, School Performance and Appraisal Meetings (SPAM) from 2009 to 2012 in the Sefwi – Wiawso Municipality pointed to absenteeism and parental irresponsibility as the main contributors to students' poor academic performance. Though some parents indicated that they help their children in their school assignments after school, the question that remains unanswered is the nature and form this assistance takes. This assistance given by these parents mostly end with the usual insults and the accusation of the lack of seriousness on the part of the child instead of giving the child the needed moral support and encouragement. The contribution of children in these meetings clearly indicate how emotionally detached some parents are with their children. Headmasters' reactions to some of the issues relating to absenteeism also point to the lack of parental support of both the child's material as well as emotional needs.

Also, Annual Reports of 2011 and 2012 from circuit supervisors in the municipality continuously highlight absenteeism and students' lack of interest in education as reasons for poor academic performance. This lack of interest, according to these supervisors, stems from the fact that some of the students do not see any prospect in their academic pursuits. The guidance and counselling office has been inundated with copious reports for possible guidance and counselling interventions.

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This study is therefore an attempt to investigate parents' style of bringing up children and how these styles affect their school attendance.

PURPOSE OF THE STUDY

In view of the problem identified, the purpose of the study was to investigate the effects of the three main parenting styles; authoritative, authoritarian, and permissive, in the Sefwi-Wiawso Municipality on the school attendance of Junior High school students.

Research Questions

The following research questions were addressed in this study.

1. What is the effect of authoritative parenting style on school attendance?
2. What is the effect of permissive parenting style on school attendance?
3. What is the effect of authoritarian parenting style on school attendance?

Significance of the Study

The study is significant in assisting parents in the selection of the appropriate style in child - rearing to give their children the needed confidence to face their developmental challenges as noted by Wolfradt, et al (2003). It will also help parents appreciate their roles in creating the right emotional climate in the home to help the child develop an acceptable self-concept and highlight the need for parents to encourage bidirectional communication between them and their children. The study will also aid parents to realize the importance of their involvement in school activities and parenting style as a contextual dimension in shaping their children academic outcomes.

METHODOLOGY

Research Design

The study followed the quantitative model of a correctional design using a cross-sectional approach. This approach is preferred over others because it allows indirect measure of the nature and rate of changes in the physical and intellectual development of samples of children drawn from a representative age group (Cohen, Manion & Morrison, 2007).

Population

The study covered all public Junior high schools (JHS) in the Sefwi - Wiawso Municipality of the Western region of Ghana. A total population of 6,476 can be found in the 50 public JHS in the Municipality for the 2014/2015 academic years. This consisted of 3,443 male and 3,033 female. The target population for the study was the final year JHS students in public JHS schools in the Municipality. The total population of final year JHS student for the 2014/2015 academic year was 1,736 (Sefwi Wiawso Municipal Education Directorate, 2013)

Sample and Sampling Procedure

In consonance with Krejcie and Morgan (as cited in Cohen et al. 2007), a total sample size of 340 was drawn from the population of 1,736 (representing the population of final year JHS students in the Municipality for 2014/2015) using the table of random samples. There are seven circuits making up the number of schools in the Municipality. To ensure representativeness, all circuits were included in the study. This gave a total of seven strata. A simple random sampling technique procedure was then conducted within each stratum to select four schools by the lottery method. In all a total of 28 schools out of 50 (this represented 56% of public JHSs in the Municipality) were selected.

Instrument

The study is a quantitative research and questionnaire was the main instrument used for data collection. Parental child-rearing style was measured using an adopted English Language version of the 30-items John Buri's Parental Authority Questionnaire (PAQ) scale. Data on self – esteem was collected using an adopted English version of Morris Rosenberg's 10-items Self – Esteem Scale (RSE) (Rosenberg, 1965). School attendance was measured using children's School Attendance Register (SAR).

Pilot Testing

The instrument was four times pilot tested at Anglican JHS Wiawso, Nana Biney JHS Dwenasi, Anglican JHS Anhwiam, and SDA JHS Wiawso, all in the Sefwi-Wiawso Municipality to evaluate its reliability and effectiveness with the local environment. A Cronbach alpha of .809 was produced for PAQ and .816 RSE scales. These alpha values indicate a strong internal consistency among items as indicated by Pallant (2005) that a value of .50 Cronbach Alpha Reliability Coefficients is good for scales with less than ten items.

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Data Collection Procedure

Questionnaire was administered by me with the assistance of trained assistants from the sampled schools. This was done based on the number of strata. Heads of sampled schools were priory informed through letters from the directorate. Date and time schedules were made to ensure the smooth flow of data collection.

Data Analysis

Statistical Package for Social Science (SPSS) version 16 was used for data analysis. Percentage and frequency distribution of data on self-esteem and school attendance were obtained using SPSS procedure. A multiple regression analysis was conducted using the SPSS procedure to establish the effect of parenting style (predictor variable) on school attendance (the criterion variables).

RESULTS AND DISCUSSION

A linear multiple regression analysis (entre method) was computed (table 1) with parenting styles entered as the predictor variable (authoritative, permissive, and authoritarian) and school attendance as the outcome variable. To once again find whether multicollnearity is a serious problem or not, the multicollnearity diagnostics were reviewed. Tolerance scores for parenting style ranged from .990 to .999 for the predictor variable. The Variance Inflation Factor (VIF) for the predictor variable was less than two (1.001 to 1.010) indicating that multicollnearity is not a serious problem.

Table 1: Multiple Regression Analysis for the Effect of Parenting Style (Authoritative, Permissive, and Authoritarian) on School Attendance (SA),

Scales	B	T	R	R2	F	Tolerance	VIF
Authoritative parenting style	.224	4.911	.471a	.222	31.879	.999	1.001
Permissive parenting style	.142	2.797				.991	1.009
Authoritarian parenting style	-.377	-8.072				.990	1.010

Source: Field data (2014)

P< .001

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Table 2: The Analysis of Variance (ANOVA) Table Indicating Model Fit

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	50.896	3	3	31.879	.000 ^a
	Residual	178.810	336	336		
	Total	229.706	339			

a. Predictor: Authoritative parenting style, permissive parenting style, authoritarian parenting style

b. Dependent variable: School attendance.

Source: Field data (2014)

Table 2 indicates the analysis of variance (ANOVA) to test whether the model is significant at predicting the dependent variable (school attendance). The table shows that authoritative, permissive, and authoritarian parenting styles together explain school attendance ($p < 0.001$). The results therefore indicate that school attendance can significantly be predicted by parenting style.

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Table 3: Regression of School Attendance on Authoritative, Permissive and Authoritarian Parenting Styles

Step1	B	Beta	R	R2	Adjusted R	T	Sig(t)
constant	2.013					13.327	.000
authoritative parenting style	.224	.237				4.911	.000
permissive parenting style	.142	.135				2.797	.005
authoritarian parenting style	-.377	-.390	.471 _a	.222	.215	-8.072	.000

Source: field data

Research Question One

What is the Effect of Authoritative Parenting Style on School Attendance?

This research question was to investigate the extent to which authoritative parenting style affects the student's school attendance. Table 1 shows that authoritative parenting accounted significantly to school attendance ($B = .224, p < .001$). It was significant in predicting school attendance with ($\beta = .224, t = 4.911, p < 0.001$). As with the prediction of self - esteem, authoritative parenting style was again the second best predictor of school attendance with $t = .224$ at $p < 0.001$. It made a positive contribution to the variance in school attendance. What this tells us is that when parents adopt authoritative style in bringing up their children, there will be a positive attitude of the children toward school attendance. The beta value .224 (Table 1) indicates that as authoritative parenting style increases by one standard deviation of .871 (Table 4), school attendance also increases by .224 standard deviation. The standard deviation of school attendance is .823 (Table 4), which indicates a change of .184 days ($.224 * .823$). This means that for every .823 years (approximately one year), spent by a parent on improving or practicing authoritative parenting, there would be an expected increase in school attendance of the child by .184 days a term. This prediction is true if permissive and authoritarian parenting styles are held constant. The results show a significant positive effect of authoritative parenting style on school attendance.

One can assign some reasons for this development in that authoritative parents are both high in demandingness and responsiveness and are highly connected to their children (Baumrind, 1971) emotionally. These parents recognize the contributions of their children as well as communicate more positives than negatives of their children to them. This gives the child that positive self-evaluation and the desire to achieve academically thus the intrinsic motivation to always be in school. As observed by Shobola et al. (2012) in their study of Nomadic children in Nigeria, they established a positive correlation between authoritative parenting style and school attendance. The child needs motivation from the home to be able to achieve in school (Teasley, 2004).

Table 4: The Mean and Standard Deviation of School Attendance, and Parenting Styles (Authoritative, Permissive, and Authoritarian)

	Mean	Std. Deviation	N
Self esteem	1.97	.807	340
School attendance	1.97	.823	340
Authoritative parenting	1.80	.871	340
Permissive parenting	1.75	.782	340
Authoritarian parenting	1.84	.852	340

Source: field data

Research Question Two

What is the effect of permissive parenting style on school attendance?

This question sought to find out if the three typology of parenting style should stand individually, what will be the contribution of each to school attendance by the student. From Table 1, it can be deduced that permissive parenting style also

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made a significant contribution to the variance in school attendance with a beta value of ($B = .142$, $t = 2.79$, $P < .005$). With the $t = 2.79$ and $p < 0.001$, permissive parenting style thus become the poorest predictor of school /attendance with the present sample after authoritarian and authoritative parenting styles. It positively accounted for the variance in school attendance. The beta value suggests that as permissive parenting style increases by one standard deviation of .782 (Table 4), school attendance increases by .142 standard deviation. The standard deviation of school attendance is .823 therefore this indicates a change of .117 days ($.142 * .823$). So for every .782 years (approximately a year), spent by a parent to improve his or her style of parenting in this direction, we expect school attendance of the child to increase by .142 days (not close to one day) in the term. This is true if the other predictor variables (authoritative and authoritarian) are held constant. The result of the current study indicates that permissive parenting style has a significant positive effect on school attendance.

Though the finding is statistically significant and positive in prediction with the current sample, there was no respondent whose score actually showed he or she was coming from a permissive parenting background. Being a good predictor with the current sample could be assigned the reason that may be due to the fact some of these children live with other relatives in the urban centers to attend school; these relative may decide to relax the rules in order not to attract "bad names" from the extended family. Another reason could be that some of these children may be confused in balancing the style of their actual biological parents and their caregivers. The present finding is however consistent with the findings of Shobola et al. (2012) among Nomadic children in Nigeria. It is also consistent with Okorodudu (2010) finding among adolescents of Delta Central Senatorial District of Nigeria. The present finding is however inconsistent with the finding of Brill (2009) whose finding established a negative correlation between parents' permissive style and child school attendance. Another inconsistency is with the findings of Ang and Goh (2006) among Asian children. They argued that culture may account for their finding.

Research Question Three

What is the Effect of Authoritarian Parenting Style on School Attendance?

This research question sought to investigate the impact of authoritarian parenting style on school attendance. Table 1 indicates that authoritarian parenting style made a significant contribution to the variance in school attendance ($B = -.377$, $t = -8.072$, $p < .001$). Consistently, with $t = -8.072$ and $p < 0.001$, authoritarian parenting style is significant and thus the best predictor of school attendance among the present sample. The beta value of $-.377$ is an indication that authoritarian parenting style made a negative contribution to school attendance. It means that as authoritarian parenting style increases by one standard deviation of .852 (Table 4), school attendance decreases by $-.377$ (table 1) standard deviation. The standard deviation of school attendance of the current sample is .823 which is an indication of a change of .310 ($-.377 * .823$). So for every .852 years (approximately one year) spent by a parent practicing authoritarian style on the child, there is the expectation that school attendance by the child would reduce by .310 days a term. This holds true if authoritative and permissive parenting styles are held constant. The current result indicates that authoritarian parenting style has a significant negative effect on school attendance.

Inconsistent parenting attitude and parents not valuing education could be contributing to the negative effect of authoritarian parenting of school attendance (Hocking, 2008). Authoritarian parents expect their orders to be obeyed without explanation (Rowntree, 2007) and because of this they sometimes condoned children absenteeism (Hocking, 2008) by ordering them to do things they think will enhance their status at the expense of the education of the child. For example the farmer in the village will prefer the child to assist more on the farm since that would enhance his or her status among great farmers in the village than encouraging that child to go to school. Children of these parents are compelled to comply because of the fear that they may be punished. Automatically, no human being wants to be overly controlled and children from Sefwi Wiawso Municipality are not different. They also expect their parents to give them some emotional support and recognition of their worth as all other children anywhere around the globe would expect from their parents, cultural dynamics notwithstanding. The child needs some level of motivation to want to achieve in school. If the parent does not show any concern for the child's emotions, that intrinsic motivation mentioned by Grolnick and Farkas (2002) would be lost on the child. So because these parents are predominantly farmers and exclusive in most case in farm settlements as well as the fact that some of them might have experienced authoritarian parenting, they do not value granting emotional freedom to children. Reid's (2008) observation that children who experience home difficulties are more prone to dislike school attendance has been confirmed by the present finding. The finding also supports the claim that poor parent – child relationship is a major contributor of absenteeism among students (Cornville et al. 1998).

IMPLICATIONS AND RECOMMENDATION

The negative results between authoritarian parenting style and school attendance called for parents' need to restructure their homes in order to give their children a positive self-acceptance outlook. Taking an excerpt from one of the statement on authoritarian parenting style that states "As I was growing up, my parents always wanted me to do whatever they asked you to

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do immediately without asking questions”, for example, if a child’s response to a statement like this is “strongly agree,” (which, of course was the case) it tells us that such a child would never have his or her voice heard in that family. Not letting the child’s voice to be heard means making the child coiled back to the state of timidity with the negative feeling that after all nobody would listen to me. This negative feeling may lead to underachievement. The implication of this to the parent is bidirectional in that the parent may not get the best out of the child and the child will equally not enjoy any emotional freedom in the family.

The implications of the study for education are three fold. The first is the link between school attendance and parenting style. This calls on policy makers to, in their attempt at eliminating or reducing the incidence of student absenteeism, fashion out policies that will bring out positive parenting outcomes. Parents can benefit from parenting programmes which could be organized in the churches, mosques, the media (print and electronic), and the national information service department. There could also be regular Parents – Teachers Association (PTA) and School Management Committees (SMC) interactions to foster a strong school – home relation as well as educate parents to improve children’s attendance to school.

It is recommended that there should be programmes put in place to strengthen existing school – home relationship because any disconnection would adversely affect the child.

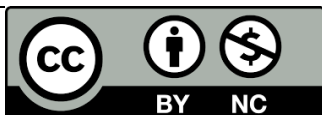
It is also recommended that the department of Social Welfare should put preventive intervention programmes in place to encourage parents to be more authoritative in bringing up their children than providing adhoc solutions to issues.

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Students' Common Errors in Solving Routine & Non-Routine Problems: A Mixed Method Analysis



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ABSTRACT: This research was conducted to identify errors committed by students in solving word problems, determine their possible causes and propose corrective measures for classroom teaching. The analysis was centered on the five errors adopted from Newman's Error Analysis Guide namely: reading, comprehension, transformation, process, and encoding.

The study used a mixed-method research design. In collecting errors, the students were given a series of test questions. The results of the tests were compared and the specific error patterns along with the probable sources were descriptively investigated. Two weeks after the test, students were interviewed to identify their misconceptions and their reasoning. In the interview process, students were asked to explain their thinking while they were doing the same problems again. Some prompting questions were asked to facilitate this process and to clarify more about students' claims. The data gathered were treated statistically using frequency count, mean percentage, and test concerning two means.

Findings reveal that some of the common errors were seen to be persistent and the sources from which they derive were not consistent. Thus, the students' errors occurred in varied ways in problem-solving situations. Analysis of error patterns led to the conclusion that the students have difficulty on algebraic symbolism and analysis of the problem. Their inability to deduce the correct meaning of mathematical statements further create a chain of errors on succeeding steps required of a mathematical word problem.

The conclusions drawn from this investigation strongly justify the needs to recognize and to develop critical and analytical thinking of the students. That is, students must be expose in solving non-routine problems in order to provide them an opportunity to develop higher-order thinking in the process of understanding, analysis, exploration, and application of mathematical concepts.

KEYWORDS- Routine and Non-Routine Problems, Error Analysis, Problem Solving Heuristics, Misconceptions, Mixed-Methods

I. INTRODUCTION

Twenty-first century mathematics education is about facing novel real-world problems, nurturing creative thinking skills, and cultivating productive ways of learning. Many educators have embarked on searching for new teaching methods, as well as seeking innovations on teaching and learning to prepare the youth for the demands of this new era. Nowadays, there are many ways to learn and understand mathematics and connect it to the experiences that the students have outside of school (Cusco, 1995). Hence, educators have been shifting their views in teaching mathematics towards a more learner-centered focus where the students take active role in the discovery of the ideas.

Mathematics in the real sense is a science of space and quantity that provides opportunity for the intellectual gymnastic of the man's inherent powers. It is an exact science which involves high cognitive abilities. It is an important subject; its usefulness cuts across all spheres of life such as commerce, science, computer processing, engineering and music. However, it is quite ironic that something so vital is disliked and feared by so many students. Some students even consider it as a roadblock rather than a gateway to choosing a career. Because of this, mathematics educators are challenged to overcome hindrances to mathematics learning in school. Therefore, it becomes imperative for the teacher to motivate the students to love mathematics for it will prepare them for more challenging tasks in the future.

Problem solving has long been recognized as one of the hallmarks of mathematics and is now being encouraged to be the main activity in all mathematics classes. Students should be encouraged to work on problems that may take hours, days, and even weeks to solve to develop effective problem-solving activity (Mikusa, 1998). It has been observed that students lack the

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necessary skills to engage in real-life problem solving outside the school setting. This is because students are only trained to work on routine problems that have well-defined goals where all the needed information are given to be able to solve a problem.

Word problems can be classified as routine or non-routine. According to Polya (1962), solving a routine problem does not contribute to the mental development of the student. He believed that non-routine problems should be employed to provide students an opportunity to develop higher-order thinking in the process of understanding, analysis, exploration, and application of mathematical concepts. However, students generally fear the idea of solving non-routine problems because these problems are usually non-standard and involve unexpected or unfamiliar solutions. Students also become apprehensive, anxious, and uncomfortable since they are not able to recall and apply learned procedures in a straightforward manner.

It is further noted that common errors in mathematics are held not only by low achieving students but also by high achieving students, thereby hindering the learning process (Wetzel, 2008). It is also observed that students, particularly those who belong to the lower and upper quartiles of the class, commit minor and major errors in computation. These errors arise from their lack of mastery and misconceptions in solving problems, thereby hindering their mathematics proficiency. Thus, teachers need to look for these patterns and correct such by making students realize that these are indeed errors in need of correction. Thinking along this line, the researcher's question about the students' common errors in solving word problems becomes the impetus for this research study.

II. RESEARCH PROBLEMS

The main purpose of this study is to identify the error patterns and misconceptions of the students in solving word problems. Specifically, this study sought to provide answers to the following queries:

1. What are the common errors committed by students in solving routine and non-routine problems?
2. At what stage do the high and low achieving students commit the least and greatest error in solving routine and non-routine problems?
3. Are there significant differences between the high and low achieving groups in solving routine and non-routine problems with respect to:
 - A. Error patterns
 - B. Percentage of errors committed at each stage?

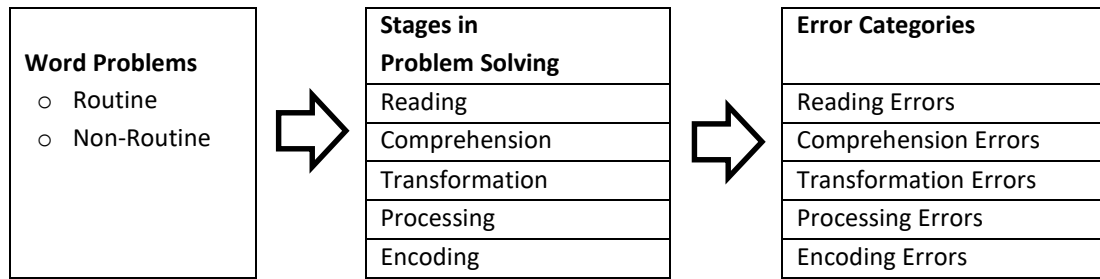
III. CONCEPTUAL FRAMEWORK

Most of the times, students do not understand why they are having math problems (Wijaya, 2006). Students may struggle with one or more areas in math and thereby, make errors as they attempt to solve word problems (Russel, 2006). As cited by Li (2006), Booth (1988) pointed out that one way of trying to find out what makes mathematics difficult is to identify the kinds of errors students commonly make in this subject and investigate the reasons for these errors. This was echoed by White (2000) who recommended conducting error analysis to determine why students make the mistakes and often repeat the same mistake will minimize habitual errors.

One guide for analyzing students' error in solving word problem is the Newman's Error Analysis (NEA). White (2005) notes that Newman's Error Analysis (NEA) provides the framework in identifying the reasons that underlie the difficulties learners face in solving math problem. He explained that NEA allows the analysis of potential problems and then identifies ways to resolve these problems. The conceptual model (refer to figure 1), highlights the concept that when learners confronted word problems, they have to surmount a number of hurdles including reading, comprehension, transformation, process, and encoding.

Reading errors are committed when someone could not read a key word or symbol in the written problem to the extent that this prevented him from writing anything on his solution. Comprehension errors are committed when someone had been able to read all the words in the problem, but had not grasped the overall meaning of the words. Transformation errors are committed when someone had understood what the problems wanted him to find out but was unable to identify the operation, or sequence of operations or the working equation needed to solve the problem. Processing errors are committed when someone identified an appropriate operation, or sequence of operations or the working equation but did not know the procedures necessary to carry out these operations accurately. The encoding errors are committed when someone correctly worked out the solution to a problem, but could not express this solution in an acceptable written form.

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IV. METHODOLOGY

The nature of the research problems raised in this investigation lend themselves to a mixed method design which is characterized by the collection and analysis of quantitative data followed by the collection and analysis of qualitative data (Creswell, 2003). Typically, the purpose of a mixed method design is to use qualitative results to assist in explaining and interpreting the findings of a primarily quantitative design. The initial quantitative phase of the study may be used to characterize individuals along certain traits of interest related to the research questions. These quantitative results can then be used to guide the purposeful sampling of participants for a primarily qualitative study. The findings of the quantitative study determine the type of data to be collected in the qualitative phase (Gay, Mills and Airasian, 2006).

Consistent with mixed-method design adopted in this study, a combination of quantitative and qualitative measures were used to collect data to answer the research questions raised in the preceding chapter. In the quantitative part of this study, the researcher used a test instrument to identify and classify student errors. A total of 10-item problems solving test were used in the study as part of the subject course requirements in Math 4: Solid Mensuration. Interviews were then be conducted to unravel students' reasoning and misconceptions that resulted in such errors in the qualitative part of the study. In this study, an interview technique guided by Newman's Error Analysis was used to further clarify the errors made by the students and the reasons for such errors. A key assumption in this interview technique is that the types of errors students make will be consistent from one problem to another.

The procedure can be described as follows: Metacognitive questions are shown in italics.

Classification	Typical questions	Error classification
Reading	Please read the question to me. <i>If you don't know a word, leave it out.</i>	The student could not read a key word or symbol in the written problem to the extent that this prevented him/her from proceeding further along an appropriate problem-solving path.
Comprehension	Tell me what the question is asking you to do. <i>What do you mean when you say...?</i>	The student has been able to read all the words in the question, but has not grasped the overall meaning of the words and, therefore, was unable to proceed further along an appropriate problem-solving path.
Transformation	Tell me the method you can use to find an answer to the question. <i>How will you start to find an answer to this question?</i>	The student had understood what the questions wanted him/her to find out but was unable to identify the operation, or sequence of operations need to solve the problem.
Process skills	Show me how you worked out the answer to the question. <i>Explain to me what you are doing as you do it.</i> <i>Do you know you are right? Why?</i>	The student identified an appropriate operation, or sequence of operations, but did not know the procedures necessary to carry out these operations accurately.
Encoding	Now write down your answer to the question. <i>How confident do you feel about the answer?</i>	The student correctly worked out the solution to the problem, but could not express this solution in an acceptable written form.

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V. RESULTS

A. *Students' Errors in Solving Routine Problems*

Generally, in solving routine problems, about 3 to 6 high achieving students made errors along encoding. These students were able to understand the problem and perform accurate calculation but failed to indicate the unit and simplify the final answer. Moreover, 0 to 3 students go beyond transformation level but failed to perform accurate calculation correctly. These errors were made due to some misconceptions and misunderstandings in some mathematical concepts. This was corroborated with the claim echoed by David (2007) as cited by Colendra (2009) that errors committed by the students is the product of misconceptions and weak computational fluency. In addition, 0 to 2 students committed transformation errors. These students could interpret the problem but could not fully translate the sentence "*the length is three times its width*" into mathematical sentences. This result agree with the study of Ragma (2014) revealing that most of the transformation errors made by students were due to insufficient understanding of mathematical expressions and poor skills along mathematical translation. It is also good to note that no high achieving student committed errors along reading and comprehension stages.

On the other hand, about 1 to 10 low achieving students made mistakes along encoding. Though these students fully understand the problem and perform perfect calculation, they were failed to indicate the unit in their final answer. Moreover, 1 to 9 students committed errors along the process stage. These students went beyond transformation level, but failed in working the correct solution. About 1 to 4 students made errors along transformation. Most of them made errors in translating mathematical sentences into mathematical expressions. This finding relates to the study of Colendra (2009) revealing that low achieving students failed to translate word problems into corresponding mathematical sentences.

B. *Students' Errors in Solving Non-Routine Problems*

In solving non-routine problems, about 2 to 8 high achieving students committed mistakes along processing stage. These students were able to understand what the questions wanted them to find out and identify series of operations or formulate the working equations needed to solve the problem however, failed to correctly write the solution. These results agree with the study of Ragma (2014) revealing that most of the students committed processing errors along word problems involving algebra concepts. He stated that the students lacked critical analysis as to when and how to end the mathematical process correctly. About 0 to 3 students made mistakes along comprehension. These students failed to understand the problem and most students left the problem unanswered. This means that the students did not know what to do and what the problem is talking about. These corroborates with the findings of Hall (2007) emphasized that most students who find difficulty in understanding the problem often abandon solving such problems.

Contrariwise, about 4 to 9 low achieving students were able to go beyond reading level but failed to completely and correctly understand the problem. Most comprehension errors occur when students do not understand mathematical sentences and terms used and some students often misunderstood what the questions wants. This weakness is probably due to the lack of balance between understanding of mathematical concepts and arithmetic skills. The findings run parallel to Zacaria (2010) divulging that students always make errors in understanding the terms used in the problem since the mathematical terminology is being ignored. This confirms that lack of proficiency in English is indeed a hindrance in mathematics learning. Furthermore, 1 to 4 students made processing errors. These students failed to understand and describe what is being required in the problem. Most students did not manage to perform appropriate method, thus results in failure to solve the problems. The students also failed to do computation correctly and perform operations involving algebraic expressions.

C. *Differences in the Error Patterns by High and Low-Achieving Students*

To investigate differences of patterns of errors among groups compared, test concerning two means was carried out. The two groups involved in this investigation were compared in terms of the errors they committed at each stage of problem solving process. Doing this may clarify if error patterns of the results may be connected to the students' achievement. It is of great interest in this study to better understand the convergence and divergence of high and low-achieving students' errors in solving word problems.

It can be seen in Table 1 that in solving word problems, the errors usually committed by the students in the high achieving group and low achieving group had significant differences. At 0.05 level of significance, the p-values confirm that the differences among students' achievement and pattern of errors they made at each stage are statistically significant. These results support the hypothesis that the pattern of errors committed by high achievers and students from the lower group significantly differ. Hence, there is variability of errors were committed by students when grouped according to their achievement as they solve word problems.

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Table 1. Differences in the Error Patterns of the Students in Solving Word Problems (by group: high and low group)

Error Patterns (by group-high and low)	Routine Problem			Non-Routine Problem		
	Mean	t-value	p-value	Mean	t-value	p-value
Reading Error	- -	-	-	- -	-	-
Comprehension Error	- -	-	-	3 ^l 0.67 ^h	5.6308	0.0000**
Transformation Error	1 ^l 0.333 ^h	2.6018	0.0163**	1.08 ^l 0.08 ^h	3.0890	0.0054**
Processing Error	1.167 ^l 0.5833 ^h	2.612	0.0159**	2.4167 ^l 1.5 ^h	2.4881	0.0209**
Encoding Error	1.9167 ^l 1 ^h	2.2930	0.0077**	1.4167 ^l 0.333 ^h	4.0206	0.0006**

**Significant at 0.05 level of significance

Note: Superscript indicates the mean number of errors of the two groups (e.g., h-high group and l-low group)

D. Differences in the Number of Errors Committed by High and Low-Achieving Students

It may also be recalled that students' errors in solving word problems were analyzed using Newman's Error Analysis Guide. This guide involves series of stages where students usually committed errors as they solve mathematical problems. Number of errors can be drawn at each stages in solving word problems from the combined solution of the two groups of participants.

Apparently, it is the interest of this study to better understand differences of the number of errors committed at each stage of the participants who were dichotomized as high and low achieving group. That is, they were classified as members of the high-achieving group as their grades fall in the third quartile (upper 25%) and to the low group as their grades are in the first quartile (lowest 25%). Doing this may elucidate if number of errors at each stages may be connected to students' achievement. To investigate differences among groups compared, test concerning two means was utilized.

As explicitly suggested by the data captured by Table 2, at 0.05 level of significance, the solution submitted by the students in solving word problems reveals that there is a significant difference between the number of errors made at each stage by high achieving students and students working with the lower group. That is, number of errors committed by students from the two groups are significantly varied. The indicated p-values tested at 0.05 level of significance, are all statistically significant.

Table 2: Differences in the Number of Errors Committed at Each Stage in Solving Word Problems (by group: high and low achieving)

Stages	Routine Problem			Non-Routine Problem		
	Mean	t-value	p-value	Mean	t-value	p-value
Reading	- -	-	-	-	-	-
Comprehension	- -	-	-	0.7 ^h 6.2 ^l	9.2159	0.000**
Transformation	0.6 ^h 2.8 ^l	4.5537	0.0002**	0.8 ^h 1.9 ^l	2.6783	0.0137**
Processing	1.1 ^h 3.0 ^l	4.5388	0.002**	1.8 ^h 3.2 ^l	3.4123	0.0025**
Encoding	3.0 ^h 4.5 ^l	3.1920	0.0042**	1.3 ^h 3.5 ^l	5.0187	0.0004**

**Significant at 0.05 level of significance

Note: Superscript indicates the mean number of errors of the two groups (e.g., h-high group and l-low group)

V. CONCLUSIONS

One of the goals of this investigation was to identify and compare errors committed by students in solving word problems. This investigation is classified as mixed-methods design which tried to capture the strengths of both quantitative and qualitative research. Consistent with this end, students were bifurcated into high and low achieving group. As discussed in the preceding part

Students' Common Errors in Solving Routine & Non-Routine Problems: A Mixed Method Analysis

of this study, participants belonging to high group were those whose general weighted average belonged to the first quadrant, whereas members of low group were those whose grades belong to the fourth quadrant.

The data were obtained by means of two sets of word problems which were administered in one time point. Error analysis was done by adopting Newman's Error Analysis Guide. Statistical calculations such as frequencies, percentages, means, standard deviations, and test concerning two means were used to analyze the data gathered.

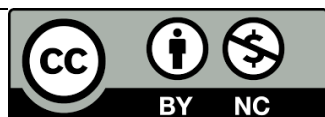
The analyses suggest the errors usually made by the students in solving routine and non-routine problems varied, hence it can be deduced that students have difficulty in dealing with non-routine problems which involve unexpected and unfamiliar solutions and requires higher-order thinking in the process of understanding, analysis, exploration, and application of mathematical concepts. It is also good to note that students working with the higher group committed lesser errors than their counterparts in solving mathematical problems. Therefore, mathematics educators may need to be reminded once again that they can design learning experiences in mathematics classroom which enable students to manifest deeper understanding of mathematical concepts and develop their numerical skills. This is to realize the goal of improving students' mathematics achievement and to reduce mathematical errors. Moreover, Mathematics teachers are likewise recommended to expose their students in solving non-routine problems since the analyses revealed that students generally fear the idea and feel uncomfortable in working this type of problem. That is, mathematics educators must recognize the need to develop critical and analytical thinking of the students through problem solving.

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ABM Method: The Application of Traditional Festival Elements in Interactive Packaging Design



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ABSTRACT: This article mainly focuses on the application of Yao Panwang Festival elements on interactive packaging design for local products, discusses the interactive packaging as a carrier to convey the festival cultural spirit. The methods ABM: Analysis(festival contents)-Build relationship (traditional vs modern)-Media(interactive package,toy,emoji,etc.). This article builds the "Interactive Packaging Design Analysis Table" to explore and evaluate. The interactive packaging features are expressed through three parts: packaging structure, Packaging visual information and function extension. This research helps to improve the cultural and tourism experience, promote economic development and reduce environmental pressure.

KEYWORDS: ABM method, festival, interactive packaging design

INTRODUCTION

Traditional festivals are one of the representative symbols of regional culture, it has high cultural value under the context of post-modern consumption. Festivals are a concentrated reflection of the local life-style, it provide a content basis for cultural tourism experience(Liu B,2017), it also as an important part of cultural exchanges and cultural experience. Under the worldwide online shopping style and the logistics system, the local specialty packages can be as solid advertising carrier that shapes the image of local culture and an important carrier for constructing cultural identity.

Follow the green design concept, the life of interactive packaging is prolonged than disposable packaging box, and the packaging undergoes functional transformation during use or after the protect function is completed; the dynamic information transmission characteristics more effective and interesting when customers "play" with the packages, At the same time, customers receive information more proactively. It can be seen that interactive packaging has certain advantages over traditional disposable packaging.

Based on the above two points, this study takes the application of Panwang Festival elements in packaging interactive design as an example, The motivate is combines festival and interactive packaging design, and to provide reference to drive rural sustainable development. The following is the research framework(fig.1).

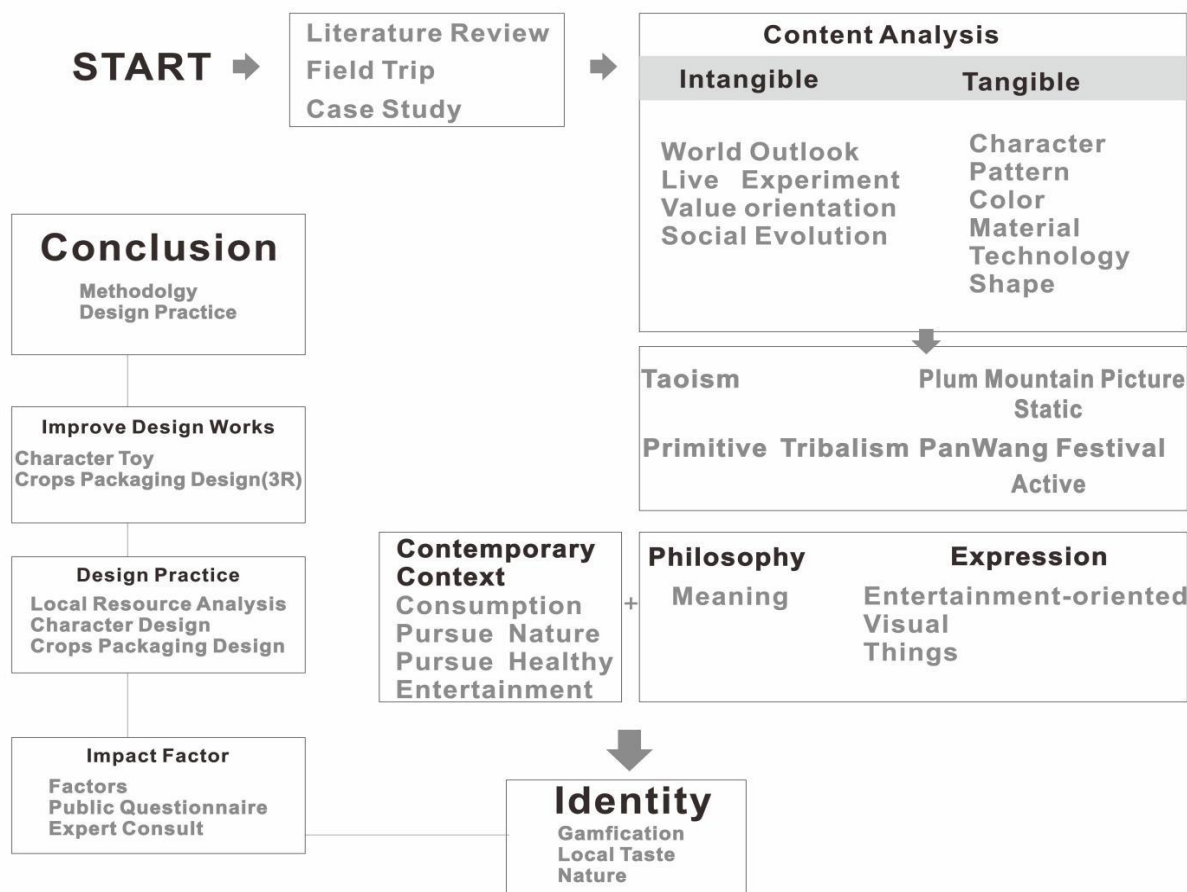


Fig. 1. Research framework.

I. DATA COLLECT AND ANALYSIS

1.1 Data Collection

Collect topic-related materials through expert interviews, local chronicles reading, museum visits, festival experience, focusing on the authenticity and typicality. The key point of this session is to organize effective interviews with old artists and inheritors who play a key role in traditional festivals, to learn more about the content arrangements of festivals and their reasons, and to learn about Philosophical significance about hanging statues, dances and props, costume patterns, songs. And then save and classify the videos, pictures, notes, physical samples and other materials.

The collection of data is divided into three steps: the first step is to interview Jiang Lifa, the inheritor of the intangible cultural heritage "Yao Blowing and Tart Drum Dance" in Guangxi, and the intangible cultural heritage of Guilin "Meishan Picture" Yang Shouming, the inheritor of "Traditional Painting Skills".

The second step is to visit the Yao Museum in Gongcheng City. The museum displays Yao ethnic costumes, ethnic architecture, festival scene simulation, etc., and conducts research on clothing modeling, pattern styles, materials, and fabric skills in the context of Yao ethnic festival culture, the museum display have the characteristics of artistic geography.

The third step is to read local Chronicles, monographs, picture albums and other books and watch video materials of festivals. This part focuses on collecting the recordings about myths and legends, and video materials. It uses databases such as National library, university libraries to search earlier published literature materials and works of authoritative experts, and draws descriptive relation maps of nouns and adjectives in description images and stories. In this paper, books such as History of the Yao Nationality, Selected Folk Stories of the Yao Nationality, Notes to Meishan Picture, and Paintings of Yao Statue in the Qing Dynasty were read to build a descriptive relationship map of the Pan Wang Festival of the Yao Nationality.

1.2 Analysis of festival contents

This part uses the content analysis method to analyze the "sacredness" construction process of the Yao ethnic Panwang Festival. From the human-centered perspective, analyze the eight relationships between human with God, history, language, human-self, time, geography, create things and matter(fig.2), and then, summarize the festival cultural core value and elements.

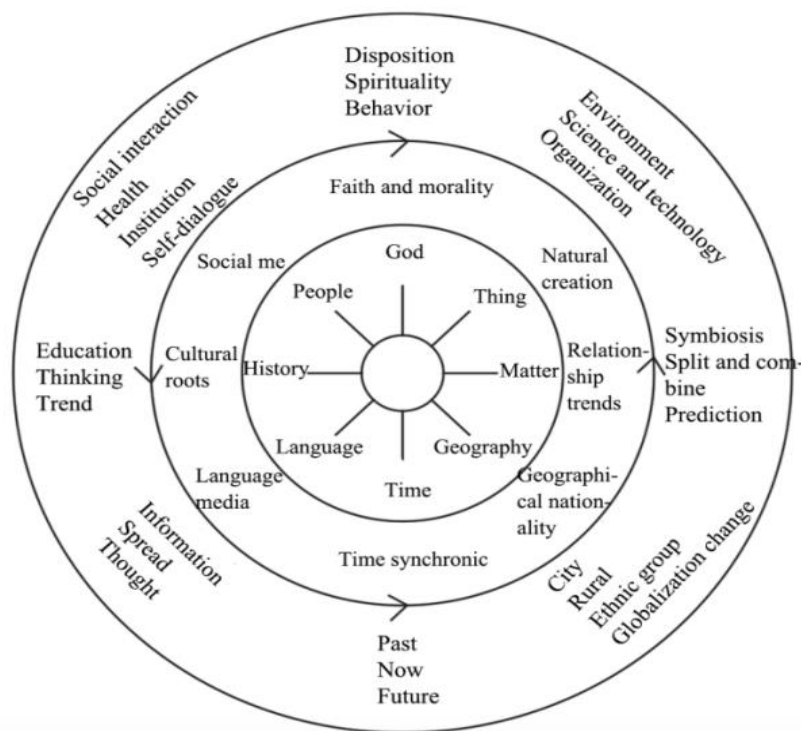


Fig. 2. Content analyse framework

The Yao nationality's Panwang Festival mainly consists of four parts: visual pictures space, vocal music and dance, Panwang song, and sacrificial activities. The visual image space as visual center by hanging Panwang statue and Taoist statues, red flags which drawn Yao nationality totems were arranged around the space, villagers wear costumes with ethnic characteristics. Sacrificial cases and offerings are set up in front of the Panwang statue. The theme, organization, and colors of the Yao costume patterns have special meanings, the patterns include dragon-dog pattern, sun flower, Panwang seal pattern, tree, human pattern, etc. Among them, dragon-dog is the ancestor of Yao nationality (Lu.W.X 1987). Sun flower, tree pattern, human pattern and other content reflect the Yao people's understanding of the external world, elements were arranged into the picture with balanced space, the space of each element look like equal, and the composition is harmonious and full. It embodies the world view of harmony and unity between man and nature respected by the Yao people. Its thinking can be traced back to the Taoist theory of "the harmony between man and nature". The vocal dance and Panwang song are carried out with different artistic expression simultaneously. The main content is to thank the Panwang for protect and pray for good luck. It advocates Yao ethnic group to unite and cooperate, be honest and trustworthy. Sacrificial activities mainly focus on offering cow , hunting, and agricultural products to show the characteristics of Yao nationality's production and lifestyle. Offerings are important production tools and crops, which are displayed with simple form (Tab.1).

Table 1. Analyse of panwang festival contents

index	Main indicator	Secondary indicators	Note
01	Man–Man	Clan, intermarriage	folk songs, local dance,
02	Man–God	Ancestor worship	Panwang portrait, Four Saints, dragon-dog, Taoist statues,
03	Man–Thing	Creation technology	Drum, building, cloth, food,
04	Man–Matter	Live experience	Life-style
05	Man–Geography	Geographical features	Mountains, weather, birds, animals, crops, leaf, etc.
06	Man–Time	natural law	Twenty-four solar terms
07	Man–Language	Panwang song, local-dialect	Antiphonal singing
08	Man–History	Myth story	Gratitude, imagination

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Publish questionnaires (more than or equal to 200 valid questionnaires) to obtain the following information:

Tourists have a deep memory of those objects in the festival culture?

Which part of the festival culture do tourists think is the most important?

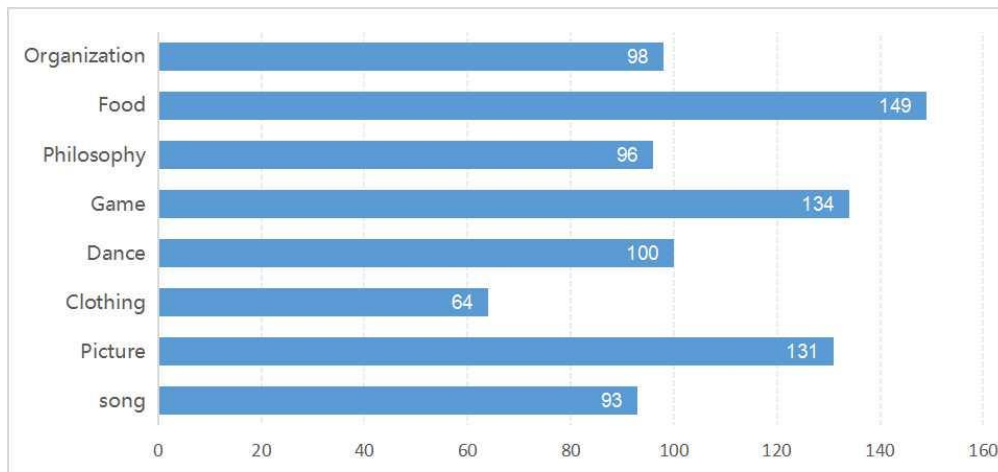


Fig.3. Demographic profiles about tourists deep memory objects (N=213 male:91 female:112)

Through data analysis(fig.3), tourists have a high degree of memory for food, visual images and entertainment, Local food, visual images, participatory activities in Panwang Festival impress tourists, Base on this study will use hanging images and drums as the main carriers to convey the cultural spirit.

2. BUILD CONNECTIONS BETWEEN TRADITIONAL FESTIVAL AND MODERN LIFE.

2.1 Agricultural civilization turns to consumer society

Traditional festivals are the product of agricultural civilization, and their main social functions are to establish social organizations and shape collective character. Elements such as hanging images, food, and clothing in festivals have serious symbolic meanings. However, the postmodern society pays attention to entertainment, secularization and popularization, which eliminates the serious meaning contained in the images, the entertainment, participation and experience of festival culture have become important factors to attract tourists.

2.2 Principles of building relationships between ancient and modern

Globalization has accelerated the convergence of lifestyles, The festival culture which have local characteristic is an important resource to meet the requirements of mass tourism in postmodern society. People's life can be roughly divided into five aspects: food, clothing, housing, transportation and entertainment. Integrate festival elements such as ancient portraits and musical instruments into the modern consumption system. This study Follow the principles:

Concept level: Inheritance and Innovation of Excellent Cultural Spirit. For example, the continuation and regeneration of traditional cultural spirit in the modern context. respect for nature advocated by modern society, sustainable design, community with a shared future for mankind, etc.

Behavioral level: participatory, entertaining, enlightening cognition. The tourists' participation in festivals, they can gain a pleasant cultural experience and gain philosophical inspiration.

Material level: A Modern Expression of Traditional Elements. Using modern materials and production technology, the traditional elements are redesigned and applied to the fields of packaging, toys, clothing, interior decoration and so on.

The representative elements of the Yao nationality's Panwang festival was established through the "Analysis Table of Packaging Design"(tab.2). The content of this analysis table is mainly composed of eight types, including modeling, information transmission, production technology inheritance, materials, function expansibility, transportation, use process, and cultural regeneration. The stable can be as brainstorm tool and test tool on the stage of beginning or the evaluation.

Table 2. Packaging design elements

index	Main indicator	Secondary indicators	Note
01	Shape and Sound	Pattern. Colour. Building. Clothing. Food. instrument	drum
02	information	Function, Fair story, Folk song	Health care,

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03	technology	Weave. Sculpture. Embroidery. Ceramic. Farm-tool. Building. painting	Rattan, dyeing
04	Material	Regional, Reproducible, Process	Bamboo, Crop plant
05	Function extension	Reuse, Recycle, Playability	Toy, Lighter, Etc.
06	Transport protection	Normal, Special, Fragile	
07	Using process	Easy, Simple, Interesting, Humanize.	
08	Re-thinking	Inspire, Insight	philosophy

3. MEDIA: INTERACTIVE PACKAGING DESIGN

3.1 Packing structure

The packaging structure is the main part of the packaging design, and the packaging structure determines how the information is presented. After product packaging completes packaging function such as protecting goods and conveying brand information, whether its functions have the possibility to expand is an important factor to increase user viscosity. The packaging structure part focuses on consumer behavior guidance and user experience psychological process, according to product attributes to build flow-type space, such as centered, symmetrical, and sequential to create a dynamic spatial organization structure for effective transmit information through gradual visual display. Consumers get experience and information by actions such as dismantling, tearing, and pulling (He,J 2019). For example, the Yao oil tea packaging uses a long drum (representative instrument in Yao festivals) as the container, it is composed of five parts: two cups, two lids, and a connecting part, it can be separated into two independent containers, or can be combined into one as a drum which can be play. The box cover uses two layers of illustrations for dynamic display(fig.4).



Fig. 4. Container and packaging design

The visual elements in festival activities are also one of the objects that tourists pay more attention to, such as character images, totem symbols, clothing patterns, etc. There are rich iconographic meanings behind the images. For example, the statues of Panwang and the four holy statues hanging in the Panwang Festival of the Yao nationality. In the context of consumption in post-modern society, the power of the image itself has disappeared, and it has turned to cultural experience. For example, the two-dimensional characters are cartoonized, and on the basis of retaining the packaging function, they have toys, teaching tools, etc., which are used as a carrier for children to exercise their hands-on ability, or for primary school students to understand local culture(fig.5).



Fig. 5. Character as package, toy, or teaching tool

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3.2 Packaging visual information

In terms of packaging vision, the dynamic presentation of packaging information is closely related to the packaging structure. The packaging structure and visual information jointly build a consumer experience situation, actively attract consumers to interact with packaging, and subtly inspire consumers to think about the cultural spirit conveyed by packaging. For example, the labels of Yao tea bags are made into separate three-dimensional shapes, each label can be folded into different shapes, and finally combined into a large leaf, which contains real social landscapes such as cities, roads, and villages. The structure maps the living space of the real world and stimulates the philosophical thinking of consumers.

The mythological story text is the script of festival activities, and its content reflects the spiritual needs of the real society. The characters and their special functions in mythological stories have a deterrent power to shock the soul, and their essence is the interaction between man and God. For example, the "Panwang" of the Yao nationality, although it is a dog in a dragon robe, has a brave and witty humanoid character. Hunting and other activities during the Panwang Festival have cultivated a brave and industrious national character. Characters created based on text content help to visualize the text, such as Li Tianshi in charge of justice, generals on behalf of bravery, and water gods in charge of agricultural water resources. In addition, transforming the two-dimensional shapes of characters into three-dimensional shapes, such as packaging containers, toys, decorations, etc., in the context of digital media, can broaden the concept of interactive packaging, organically combine physical packaging with digital experience, and express facial expressions. The form of symbols and micro-videos convey festival culture and product characteristics (Funny Packaging Design 2019). For example, a general would design an emoticon package to convey the cultural spirit of the Yao people in the form of social language (Figure 6).



Fig. 6. Character design, emoji and models.

3.3 Function extension

The interactive packaging function presents diversification and openness. Packaging is defined as toys, teaching aids, handicrafts, etc. The function of interactive packaging is redefined according to customer needs, and is no longer just a box to protect goods. Interactive packaging helps to prolong the service life of packaging, improve the timeliness of information dissemination, promote the recyclability of packaging, and reduce the pollution of waste packaging to the environment. For example, transforming Panwang Festival food gift boxes into lamps to provide lighting or improve children's hands-on ability (fig.7).

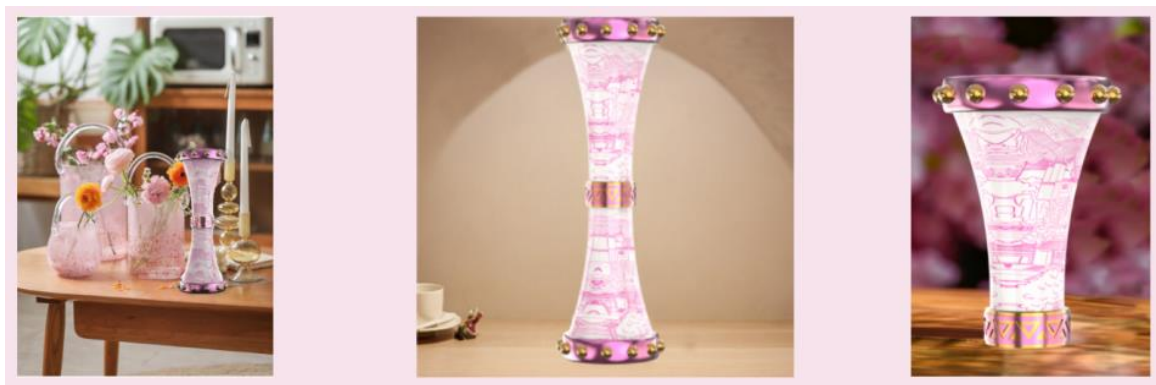


Fig. 7. Package transfer to lighter.

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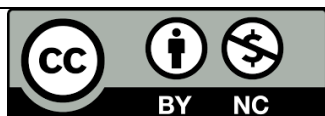
CONCLUSION

The focus of this research is to apply traditional cultural elements to modern product design through the analysis of the content of traditional festival culture. This paper takes the application of Yao ethnic Panwang Festival elements to interactive packaging design as an example, which helps to display ethnic minorities dynamically and interestingly. Festival culture and cultural spirit to establish a good relationship between consumers and packaging. The significance of this work is that interactive packaging will extend the packaging life cycle, increase functional scalability, reduce packaging waste, and reduce environmental pollution. From the perspective of cultural connotation, interactive packaging design can be an important part of enhancing the image of the festival.

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The Impact of Belief, Attitude and Subjective Norm on OCOP Products Purchase Intention of Vietnamese Consumers



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ABSTRACT: We do research about the impact of belief, attitude and subjective norm on OCOP (one community one product) products purchase intention of Vietnamese consumers. OCOP (abbreviated in English as One commune one product). In Vietnamese sense, each commune (ward) has a product. More specifically, developing the form of organization of production and trading of traditional and advantageous products in rural areas. Through testing with the fixed effects model (FEM) and random effects model (REM), we found that belief, attitude and social influence have positive impacts on the products purchase intention. Specifically, belief has the greatest impact on OCOP purchase intention of Vietnamese consumers.

KEY WORD: OCOP, belief, attitude, social influence, purchase intention.

1. INTRODUCTION

The OCOP program is an economic development program in rural areas in the direction of developing internal resources and adding value. The program is the solution and task in implementing the national target program on building new rural areas. The focus of the OCOP program is to develop agricultural, non-agricultural products and services that have advantages in each locality along the value chain, driven by private economic sectors (enterprises, producers).

The State plays a constructive role, promulgates the legal framework and policies for implementation; plans orientations for production areas of goods and services; manages and supervises product quality standards; supports the following stages: Training, coaching, technical guidance, application of science and technology, branding, trade promotion, product promotion, credit.

2. OVERVIEW AND RESEARCH METHODS

2.1. Concepts

2.1.1. OCOP:

According to Decision No. 490/QĐ-TTg issued by the Prime Minister: The OCOP - One commune one product program is a program for economic development in rural areas in the direction of developing internal resources and adding value; is the solution and task in implementing the national target program on building new countryside. The focus of the program is on the development of agricultural, non-agricultural products and services that have advantages in each locality along the value chain, driven by the private sector (enterprises, producer households) and the local economy.

State management agencies play the role of creating and promulgating the legal framework and implementing policies; planning orientations for production areas of goods and services; manage and supervise product quality standards; supporting the following stages: training, coaching, technical guidance, application of science and technology, branding, trade promotion, product promotion, support in building and adding product value, product value chain and key commodities to develop into OCOP products of the province."

In Vietnam, the OCOP program has received and been implemented since 2006 with localities implementing the project "One village, one profession" and started to implement strongly from 2013 onwards with the pioneer province of Quang Nam. The program has contributed to restructuring agricultural production, handicrafts, improving production value and is a unique brand

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of Quang Ninh province. After 3 years of implementation, the province has built 121 products, 99 of which meet the standards of 3-5 stars according to the standards at the provincial OCOP product evaluation contest taking place in May - 2016.

2.1.2. Belief:

According to Madhok (1995, p.119), trust is considered as "one party's perception of the possibility that the other party will not act for its own benefit".

According to Böcker and Hanf (2000), trust is defined as a necessary way to reduce uncertainty to an acceptable level and to simplify decisions.

Gefen et al (2003b, p.308) defined trust as "the expectation that the individuals or companies with whom we interact will not take advantage of their advantage to force us to depend on them. It is trusted that stakeholders will behave ethically, reliably, in accordance with social norms, and will deliver on their commitments."

Siergist et al. (2006) defined trust as the certainty that everything was under control and that uncertainty was very low.

According to Magnus Österholm (2010), belief was defined as when a person believed (or has faith) in something to be true. Beliefs were considered to be "subjective, empirical, and often ambiguous" knowledge (Pehkonen & Pietilä, 2003, p.2) or as personal judgments based on past experiences (Raymond, 1997), p.552).

Fishbein M. & Ajzen L. defined a subject's beliefs about an object as the position of that object in the subject's mind based on a judgment of the degree of probability that was beneficial or harmful with respect to an attribute count. Beliefs could be formed in two ways: descriptive beliefs based on actual observations and deductive beliefs based on descriptive beliefs from previous observations.

Trinh Dinh Bay (2002) believed that beliefs included two basic elements: knowledge (experience and reasoning) and emotions. Knowledge depended on the level of perception, while emotions depended on the level of satisfaction of needs and were expressed in negative or positive form. These two factors combined to form trust.

Dang Vu Canh Linh (2008) emphasized in his article that trust is the consequence of the processes of social interaction between people.

In the article by Nguyen Quang Thu and Le Thi Kim Luyen (2017), trust is defined as "the expectation in individuals or companies that through interaction will behave in an ethical, trustworthy manner., in line with social norms and will fulfill the commitments that such individuals/companies have made."

2.2.2. Social influence

Social influence is a determinant of behavioral intention such as subjective norm according to the theory of TRA (Ajzen, 1991), or TAM (Davis, 1989).

According to Fishbein and Ajzen (1975), subjective norms are defined as an individual's perception, with that individual's key references, that the behavior should or should not be performed. Subjective norms can be measured across the people involved with consumers, defined by normative beliefs for behavioral expectations and personal motivations to perform in accordance with those expectations. (Fishbein & Ajzen, 1975, p. 16).

According to TRA theory (Fishbein & Ajzen, 1975), subjective norms can be formed through perceived normative beliefs from people or social factors that influence consumers (such as family, friends, colleagues, media, etc.).

Ajzen (1991) defined subjective norm (Subjective Norms) or social influence as the perception that influencers would think that the individual should or should not perform the behavior. Subjective norms could be described as the individual's perception of societal pressures to perform or not to perform a behavior.

In a 2003 study, Venkatesh et al defined social influence as the degree to which an individual thinks others believe they should use the new system.

In the study of Gefej et al (2003b) and Lin (2007), subjective norms were defined as the opinions of people close to them (such as family, friends and colleagues, celebrities, etc.), consumer trust through individuals directly or through the mass media.

Research by Barkhi et al. (2008) shows that social influence not only has an impact on the purchase intention of customers but also has a significant impact on the consumer's attitude.

According to Teng and Wang (2015), subjective norms are social pressures that affect an individual's perception of performing or not performing a behavior.

The concept of social influence is also mentioned in a number of other studies such as technology adoption and usage patterns (Venkatesh et al., 2012; Venkatesh, 2015) or forecasting in e-commerce (Pavlou & others). Fyngenson, 2006). In this study, social influence is the influence of family, friends... on consumers' purchase intention.

According to Marifa Ham et al (2015), subjective norms are determined by perceived social pressures from others for an individual to behave in a certain way and their motivation to conform to these views of others

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Research by Vu Anh Dung et al (2012a) shows that social factors such as family and social influences are important sources affecting the interest in green products of Vietnamese people. After that, this group of authors (2012b) built and tested the model based on TPB theory (Ajzen, 1991) with the influence of social agents (family, society, government, vehicle, media) besides the attitude to explain the sustainable consumption behavior of Vietnamese people.

2.2.3. Attitude

Consumer attitude is an important concept in consumer behavior research. Attitude can be seen as an element of human nature that is formed through the process of learning. People will use attitudes to respond in favor or aversion to a particular object or event. Attitude is not directly observable, but it can be inferred from manifestations of human behavior. For example, positive feelings toward a certain product, often lead to a degree of preference, trust, and ultimately the ability to consume that product. According to Philip Kotler, the attitude describes good or bad evaluations based on persistent perception, these feelings and the tendency of a man's actions to a single person or an idea. The attitude led them to decide whether or not to like someone. According to Ajzen's research (1991), the attitude is the desired process or wish, but from which man gives specific behavior. The attitude is defined as measuring the perception and assessment of the consumer's product, the trades and the properties. According to Schiffman and Kanul (2000), attitude consists of three basic components: (1) cognitive component, (2) emotional component, (3) behavioral tendency component. The cognitive component in the model represents consumers' awareness and knowledge of a certain product, and this awareness comes from their own experiences, collects information from different sources, and thereby forming beliefs about the product and believing that the product will bring some benefits. The emotional component refers to the degree of satisfaction or dissatisfaction, like or dislike, expressed in evaluation. Consumers will rate that product as good or bad, friendly, aversion, etc. And the component of behavioral trends shows the consumer's tendency, intention to act towards the product in the direction that has been perceived and felt.

Another study by author Lobb et al (2007) introduced the SPARTA model, which is an acronym for the following factors: subjective norm (S), perceived behavioral control (P), attitude (A), perceived risk (R), trust (T), and others (A) or other variables such as socio-demographic factors. The proposed model presents the interaction between these factors for purchase intention. Research results have demonstrated that purchase intention is mainly influenced by attitude. Therefore, the results of this study support quite positively that attitude serves as an important determinant of purchase intention.

Some other research results also show that when the consumer's attitude towards environmentally friendly products or green products is positive, the consumer's purchase intention will be more likely to be positive. (Mostafa, 2006 and Mostafa, 2007) and in previous case studies, attitude was found to be the most influential factor in predicting intention (Bagozzi et al., 2000).

The relationship between attitude and intention to buy is also studied by many Vietnamese authors. Research by Nguyen Phong Tuan (2011) also shows that there is a high correlation between attitude towards organic food and purchase intention. This study was conducted in two cities, Hanoi and Ho Chi Minh City, and showed the influence of factors such as attitude towards the environment, perceived value, interest in health, and knowledge about safe food and subjective norms have a clear relationship with the intention to buy safe food of consumers in the South and the North.

According to Le Thuy Huong (2014), Attitude is an individual's positive or negative feelings about performing a certain behavior. Attitude describes the degree to which an individual views the outcome of an action as positive or negative.

2.2. The impact of attitude, belief and social influence on OCOP products purchase intention

2.2.1. The impact of belief on OCOP products purchase intention:

According to Böcker and Hanf (2000), trust has been identified as a necessary way to reduce uncertainty to an acceptable level and to simplify decisions. Research results of Lobb et al (2007) show that trust in the source of information affects the intention to buy chicken meat in the UK. A recent study by Muringai and Goddard (2018) in Canada, USA and Japan also found that beliefs influence beef and pork consumption. The research results of Stefani et al. (2008) show that general trust positively affects trust in the food supply chain, trust in policy makers and trust in government in schools. Consumption of chicken in Italy. People with high beliefs have more positive attitudes. Research results of Donthu (2001), Elliott and Speck (2005) show that trust positively affects attitude. Research results of Limbu et al (2012) also provide a proof for a positive relationship between beliefs and attitudes.

The program "One Commune One Product - OCOP" is currently one of the levers to promote economic development in rural areas, contributing to speeding up the process of building new rural areas in many provinces and cities. Currently, consumers are more careful in choosing consumer products, in addition to design and durability, they are also especially interested in safety for health, especially in the time of widespread epidemic.

Trust in a product is one of the important factors that determine whether consumers buy and use that product or not. It is not by chance that any business today, whether newly established or has existed for many years, must build and keep consumers' trust

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in that product or brand. If there is any scandal related to product quality, this will quickly reduce consumer confidence in that product. If product quality always meets the requirements of consumers, customers will trust, create brand loyalty and long-term use for the products.

In order to build trust with consumers, the OCOP product evaluation criteria are increasingly strict. OCOP products are evaluated carefully and professionally in many aspects. The evaluation board consists of experts in related fields such as health, environment, ... Not only that, the assessment also goes through many different levels, from district to provincial level, then from province to center OCOP products that meet 4-star standards have important certificates such as VietGap, ISO, ... Consumers are still unfamiliar with the term "OCOP certification", but certifications such as VietGap, ISO, or GlobalGap have been trusted by consumers. Certified products like these help consumers feel secure when shopping.

Currently, the government, ministries and businesses are propagating more about OCOP so that consumers are more familiar with OCOP products, OCOP certified, and trust in the quality of OCOP products. Once consumers put their trust, they are willing to spend money to buy products. From here, it can be seen that the positive impact of trust on OCOP product consumption behavior.

2.2.2. The impact of social influence on OCOP products purchase intention:

Ajzen (1991) states that the subjective norm for behavior is the social influence of stakeholders (friends, family, co-workers) of an individual on the performance of a particular behavior. According to TPB theory, subjective norm has a strong and positive influence on action intention (Ajzen, 1991). In a 2012 study, Ha & Janda showed that subjective norm has positive and moderate effects on green product purchasing behavior. Saleem & Gopinath (2013) studied the impact of subjective norm on behavioral intention to buy green products. The results show that subjective norm has a positive effect on behavioral intention to purchase green products (Saleem & Gopinath, 2013). Thus, most of the studies suggest that subjective norm has a positive impact on behavioral intention to purchase green products. However, in a very elaborate study, Kumar (2012) argues that subjective norms do not affect the behavioral intention to buy green products. This is contrary to the TPB theory, but the author does not give specific reasons. From the above analysis, it is shown that the subjective norm for green industrial product purchasing behavior (SNP) has a positive impact on the behavioral intention to purchase green industrial products.

According to Truong Dinh Chien (2015), the subjective norm expressing the level of consumer desire for domestic products depending on the structure of the community or society is collectivism or individualism. core. In Asian countries, including Vietnam, collectivism plays a key role, individuals influence each other strongly and the tendency is often concentrated and easily spreads from person to person. The stronger the degree of intimacy of the stakeholders with the consumer, the greater the influence on their purchasing decision. The greater the consumer's trust in the relevant people, the more their purchasing propensity will be affected. If the judgments tend to be disparaging such as: "The act of buying OCOP products is bragging; OCOP is an unnecessary product for them..." then they will tend to reduce their intention to buy OCOP products. On the contrary, if they feel the support and praise that: "The decision to buy OCOP products is a right one, showing that they care about the quality of life, family, ...", then consumers tend to have higher levels of intention to buy OCOP products.

Social influence has a positive effect on the intention to purchase OCOP products. A typical example is in Thanh Hoa province. Along with the implementation of mechanisms and policies to encourage agricultural and rural development and new rural construction, in recent years, Thanh Hoa province has implemented the Program OCOP submission. Accordingly, departments, branches and localities have flexibly used funding sources to support producers to wake up traditional occupations and develop more new ones, and at the same time strengthen promotion and support for products that are born from the village to reach customers in many difficult markets. Phu Quang lam tea products have appeared and existed on Vinh Loc land for hundreds of years, associated with the life and spirit of the people of Cao Mat village, old Vinh Thanh commune, now Vinh Loc town. Lam tea in Phu Quang land of Vinh Loc also has a brand name on the market, but the annual consumption is quite modest. Since 2018, when provinces and districts have propagated and supported producers under the OCOP Program, families have realized that this is an opportunity to give wings to traditional products to "reach out". Consumption volume reached 25 tons/year, revenue was about 1.5 billion dong, profit was 400 million dong/year, an increase of 20% compared to before participating in the program. However, the highlight that marks the transcendence of space of Phu Quang blue tea products is that Co.opMart Thanh Hoa Supermarket has selected and put the product "on the shelves" for consumers. Mr. Bui Cong Anh, Deputy Chief of the Office of Coordination of the New Rural Program in the province, said: In order to bring OCOP products to the market, especially into the retail channel system, The office has coordinated with localities, the subject launched 14 points of display, introduction and sale of OCOP products and typical goods from regions and regions. At the same time, fairs have been organized to promote, connect and trade OCOP products, attracting the participation of many cooperatives, businesses, craft villages and farms in the province. Through promotional fairs, dozens of OCOP products that meet the requirements and criteria have been selected and sold at reputable supermarkets and e-commerce platforms. This is the initial success in expanding the consumption market for the

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province's OCOP products... From the example in Thanh Hoa province, it shows that, after the OCOP program was implemented, with the attention and encouragement of the leadership of the province local leadership, sales and propaganda programs are widely deployed and product quality is improved,

From the above analysis, it is shown that the subjective norm for OCOP product purchasing behavior has a positive impact on behavioral intention to purchase OCOP products.

2.2.3. *The relation between social influence, belief, attitude and OCOP products purchase intention:*

According to Ajzen (1991) and O'Neal (2007), subjective norm refers to perceived social pressures to perform or not to perform a behavior. McClelland's theory of needs (1987) suggests that individuals tend to perform behaviors based on the desires of loved ones or reference groups. The effects of subjective norms on purchase intention are also supported in many countries including the US (Shimp and Kavas, 1984), Germany (Bredahl, 2001), UK (Mahon et al., 2006), South Korea (Lee., 1990) and China (Eves, 2007), ... and studied in areas such as buying organic food (Tarkiaine, 2005), food safety (Chen, 2007).

According to Truong Dinh Chien (2015), subjective standards are the ideal standards that members of that community adhere to as an unwritten essay. Subjective norms reflect beliefs through the opposition/support of those who are most important to an individual (relatives, friends, and those they consider important) when they engage in a particular behavior. body.

Social influence positively affects consumers' beliefs and attitudes.

Continue with the example in Thanh Hoa. Mr. Le Dinh Tu, director of Binh Son agro-forestry cooperative (Trieu Son), said: "From the existing products in the locality, the OCOP program has increased the prestige and quality of the products so that the products can be affirmed in the market. At the same time, motivation can be created for the cooperative to develop new products, increase revenue, and improve the quality of the cooperative's activities.

Currently, with the strong spread of the program, consumers understand, know, identify and identify OCOP products as quality products and brands, so they can rest assured to choose and trust. As a result, the province has developed 16 points of display, introduction and sale of OCOP products and 11 products selected and sold by Co.opMart Supermarkets on supermarket stalls. In addition, the producers are actively promoting and promoting their OCOP products to be widely consumed in the market... From the above analysis, it shows the subjective standards for product purchasing behavior. OCOP has a positive effect on beliefs and attitudes towards OCOP product purchasing behavior.

3. RESEARCH METHODS

The main research method used in the model is econometric regression with the general model as follows:

$$YDTD = 0.514 + 0.351NT + 0.218TD + 0.306AHXH + e$$

In which:

YDTD: Dependent variable "OCOP consumption intention"

NT: Independent variable "Belief"

TD: Independent variable "Attitude"

AHXH: Independent variable "Social Influence"

Formal research is a quantitative study. The process of preliminary theoretical research determines the content of issues to be researched, forms research questions and research objectives. From research objectives, research theoretical basis, identify research concepts, develop research hypotheses and research models, then design scales based on research concepts; Research hypotheses and research models are carried out through two preliminary and formal research steps. Preliminary research includes a qualitative study to adjust the scale and a preliminary quantitative study to preliminarily evaluate the scale and adjust the scale accordingly. Formal quantitative research to test the scale and theoretical models.

4. DATA ANALYSIS

4.1. Data description

The overall research is all Vietnamese consumers living and working in cities. They can be students or those who do many different jobs. Due to limited resources, the author chose 3 big cities representing 3 regions of the country to survey including: Hanoi, Da Nang and Ho Chi Minh City, in which Hanoi and Ho Chi Minh City are the two largest cities and have the highest per capita income in the country.

OCOP businesses always choose Hanoi and Ho Chi Minh City as the place to consume their latest products because these are the two largest consumer markets in Vietnam. In addition, these are also two localities with a large number of immigrants from provinces and cities across the country to live and work, the agility and ability to receive new products are always appreciated.

Due to the large scale of the study, the diversity of classification criteria is limited, in terms of resources (financial, time, accessibility...). the group cannot use random sampling method but use random sampling method but use convenience method.

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Although the sample was selected by a convenient method, in order to ensure representativeness, the team tried to evenly distribute the expected number of questionnaires according to 3 localities representing 3 regions of the country, namely Hanoi, Ho Chi Minh City and Da Nang. In addition, the group also surveyed consumers by occupation, age, and income level to be able to indicate consumers' intention to use OCOP products.

4.2. Effects of attitude, belief and social influence on OCOP purchase intention

The research results show that "Trust" is the factor with the greatest influence (standardized Beta coefficient is 0.32) on "OCOP purchase intention" in the group of 3 extracted factors within the scope of the study.

Research results show that "Social influence" is the factor with the second level of influence (Standardized Beta coefficient is 0.227) on "Intent to consume OCOP program" in the group of 3 influencing factors cited within the scope of the study. OCOP products are products that "require" consumers to also have a certain level of knowledge. Therefore, the "participation", "consultation", "sharing" of family or important people will affect consumers' intention to buy OCOP products.

Research results show that "attitude" is the factor with the lowest influence (standardized Beta coefficient is 0.203) on "Intent to use OCOP program" in the group of 3 extracted factors within the scope of the study. People's attitudes always have many changes over time, at the time of the study, the team analyzed the data and found that this is the least influential factor.

5. CONCLUSIONS

Theoretically, the topic identifies the factors affecting the "OCOP consumption intention" of Vietnamese consumers. Those factors include: "Trust", "Attitude", "Social influence". At the same time, the study also determined the intensity and direction of impact of these factors on consumers' intention to use OCOP products. The topic has built and supplemented the basic theory on consumer behavior and OCOP consumption intention of Vietnamese people such as: "Concepts of beliefs, attitudes, social influence". The concept of intention, intention to use OCOP of Vietnamese people. In Conclusion, The factor that has the strongest influence on "OCOP consumption intention" is "Trust". In addition, it also supplements and develops methodology for future studies as well as proposes practical solutions.

In practice, the research results of the topic also suggest to state management agencies, localities and businesses new directions in applying measures to increase trust and popularization to the people to have a more positive and in-depth view of the OCOP program. Specifically, the state management agency has strengthened the implementation of the campaign "Vietnamese people give priority to using Vietnamese goods", and at the same time introduced policies and plans to increase consumers' confidence in OCOP, thereby increasing the intention to purchase OCOP products. Enterprises will have positive changes, transformations and self-improvement from organization, activities to products, thereby actively participating in and contributing to disseminating the image and characteristics of OCOP to friends and partners. For people who intend to use OCOP or who intend to establish businesses participating in OCOP) they will have confidence in the quality and value that OCOP brings.

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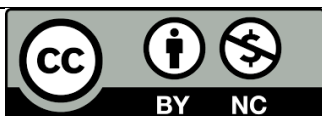
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Description of Some Anthropometric Indicators of 7-10 Year-Old Student Girls



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ANNOTATION: The growth and development of the organ system at different ages of the human body is of particular importance. Differences in morphological and physiological indicators of the organism are noticeable, especially in the early school years, when the growth rate is significantly higher. The study of some morphologically important physical development indicators of young school-age children, the study of health indicators is of great importance. This article provides a statistical analysis of some anthropometric indicators of primary school girls of secondary school. Based on the results, appropriate suggestions and conclusions are made.

KEYWORDS: adaptation, growth patterns, physical development, anthropometric indicators, growth dynamics, individual development, statistical analysis, degree of inevitability.

INTRODUCTION

In today's world, the issue of creating conditions for the healthy physical, mental and emotional development of children is a priority for the future of any society. Therefore, in order to constantly monitor the level of physical development and health of school-age children in the educational process, conduct physiometric, anthropometric research, develop and implement a set of measures to improve their health, which in turn will prevent various diseases. scientific and practical significance.

The optimal development of the level of physical activity of students in scientific research conducted in many countries around the world requires taking into account the individual characteristics of school students in relation to their physiological age in the organization of physical education classes. Studies have shown that under the influence of reduced levels of physical activity in children and adolescents in the body of the musculoskeletal system, the activity of the main functional systems of the body decreases and, in turn, increases the susceptibility to various diseases. Determining the age, gender-specific characteristics of primary school students at the level of physical development, assessment of physiological changes in them on the basis of morpho-functional system indicators are considered as promising areas of research currently underway. Therefore, in determining the health of primary school students, the analysis on the basis of indicators of physical development and readiness, the development of a set of medical and pedagogical correction, preventive measures are of great scientific and practical importance.

The response of morpho-physiological systems of the human body to the effects of various endogenous and exogenous factors is determined directly by the somatotypological characteristics of the organism, depending on the physiological age. In particular, indicators of physical development of children's bodies are considered as a reliable indicator of the successful implementation of adaptive capabilities under the influence of various factors [Chub I.S., 2013; 3-b.].

Assessment of the level of physical development on the basis of morphometric indicators allows to analyze the state of adaptation of the organism to the external environment [Shilova O.Yu., 2011; Pp. 29–36; Kirilova I.A., 2017; 5-b.].

In turn, the physical development of children is a key indicator for assessing the health status of them and the population under analysis in general [Rakhimov M. I., 2011; Pp. 57–59; Tulyakova O.V., Avdeeva M.S., Sizova E.N., 2012; Pp. 74–87; Kirilova, 2017; 5-b.].

Physical development is an integral indicator of the health of the growing human body, and it is the period of schooling is recorded as the optimal period for the formation of healthy physical development of children and adolescents [Safronov AA, Arislanov IT, 2013; 455-b.].

Monitoring of physical development is also important in terms of determining the level of development of the body of children of different ages, as well as the timely recording of deviations from the norm and the implementation of appropriate corrections. [Antonova A.A., 2012; Pp. 26–29; Kirilova I.A., 2017; 5-b.].

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RESEARCH MATERIALS AND METHODS

In research, the standard method of measuring the height (cm) of students using a stationary height measuring device (GOST 16371–93, 19917–93) [Erenkov V.A., 1984; 10–336-b.; Safronov A.A., Arislanov I.T, 2013; Pp. 455–458; Pilkevich N.B, 2013; P.], in the upright position of the test subject, the base of the legs on the special platform is paired and the torso is upright, the shoulders are in the correct position, the hump and the middle of the shovels are placed on the device. Attention was paid to the fact that the heel of the body, buttocks, chest and neck area of the head touch the measuring column, the eye area and the lower part of the ear supra are located in one plane. The head is held in an upright position, facing forward, the sliding special plate (bar) of the measuring device is lowered to the position of touching the top of the head, and the value (cm) is recorded [Muratova I.V., 2009; Pp. 59–61].

Measurement of body weight (kg). In research, the standard method of measuring the body weight of primary school students using a medical scale (TU 9441–004–00226425–2005) [Rakhimov M. I., 2011; 10–336-b.; Korobko R.P. 2002; Pp. 455–458; Karakeeva G.J., 2012; 30-b.; Nechaev M.P., 2001; Pp. 3–24], in other words, the body weight of the test student was determined by weighing on a medical scale when he took off his clothes, except for underwear (the accuracy of the measurement was ± 50 – 100 g). Measuring the length of the chest circumference (cm) - standard method [Rakhimov M. I., 2011; 10–336-b.; Korobko R.P., 2002; Pp. 455–458; Karakeeva G.J., 2012; P. 30], in which the value of this indicator in the test student was measured using a centimeter measuring tape (GOST R 50444–92) at rest, maximum exhalation, maximum exhalation. In this case, the students' chest circumference (cm) was measured at the level of the sternum line (with a measurement accuracy of ± 0.5 cm) with the arms down along the torso (Pustozero A.I., Gostev A.G., 2008; 7–14-p. ;].

OBTAINED RESULTS AND THEIR ANALYSES

The results obtained are as follows: L.V. Denisova et al. (2008) using mathematical and statistical processing [Albitsky V.Y.; 125–459-b.; Bakanov I.M, 2008; 5–312-b.; Anisimova E.A., 2014; 7–127-b.; Korobko R.P., 2002; 455–458-p.].

The results are presented in the form $M \pm t$ of the results of experiments performed at p times repetition, where M is the arithmetic mean and t is the standard error value.

Also, the results of the experiment showed that the level of statistical reliability of values between groups was calculated on the basis of the Student t -criterion and was assessed as statistically reliable at values of $<<0.05$, $r < 0.01$. The degree of reliability of the difference between the values of the two age groups was calculated according to the Student's criterion, using the following

$$\text{Formula: } t = \frac{\bar{x}_1 - \bar{x}_2}{\sqrt{m_1^2 + m_2^2}}$$

At the initial stage of the observations, the analysis of physical development indicators based on the main anthropometric indicators of primary school students (7–10 years) - body weight (kg), height (cm) and chest circumference (cm) was carried out. In our observations, we studied the anthropometric indicators of primary school girls (7–10 years) of secondary school No. 30 in Andijan. A total of 78 healthy and volunteer girls were involved in the follow-up.

Analysis of the obtained results.

In our study, the indicators of physical development were body weight, height, chest circumference (at rest, in front of the mammary glands during deep breathing and deep breathing), and statistical analysis, and the results were as follows.

1-table

Values of some anthropometric indicators ($M \pm m$) of primary school students (7-10 years old) of secondary school No. 30 in Andijan, Andijan region

Anthropo-metric indicators	Girls (n=78)			
	7 years old (n=16)	8 years old (n=11)	9 years old (n=17)	10 years old (n=22)
Weight (kg)	23,2 \pm 0,3	24,2 \pm 0,3	25,9 \pm 0,4*	33,1 \pm 0,5**
Height (cm)	122,7 \pm 6,2	127,3 \pm 5,9*	136,7 \pm 5,3**	143,6 \pm 6,8**
Chest circumference (cm): at rest; in the state of maximum respiration; in the case of maximum exhalation	58,7 \pm 0,5	65,4 \pm 0,5	70,6 \pm 0,7*	78,7 \pm 0,4
	60,7 \pm 0,5	68,8 \pm 0,4	76,4 \pm 0,5*	82,2 \pm 0,6**
	57 \pm 0,6	64,3 \pm 0,4	69,5 \pm 0,5*	74,4 \pm 0,6*

Note: Represents the level of statistical reliability of the difference between the values of 7-10 years (* - $r < 0.05$; ** - $r < 0.01$).

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The average body weight of primary school students was 23.2 ± 0.3 kg at the age of 7, 24.2 ± 0.3 kg at the age of 8, 25.9 ± 0.4 kg at the age of 9, and 33.1 ± 0.5 kg at the age of 10.

The increase in body weight among schoolchildren aged 7–10 years was a total of 9.9 kg. It was found that at the age of 7-8 years 1.0 kg and at the age of 8-9 years 1.7 kg, and at the age of 9-10 years the body weight increased by 7.2 kg.

The average height of schoolchildren was 122.7 ± 6.2 cm at the age of 7, 127.3 ± 5.9 cm at the age of 8, 136.6 ± 5.3 cm at the age of 9, and 143.8 ± 6.8 cm at the age of 10.

It was found that the average growth rate of height in schoolchildren at the age of 7-10 years was 21.1 cm, at the age of 7-8 years - 4.6 cm, at the age of 8-9 years - 9.3 cm, at the age of 9-10 years - 7.2 cm.

In the next part of our observations, the length of the chest circumference (in front of the mammary glands at rest) was determined. At the same time, the average length of the chest circumference in schoolchildren at the age of 7–10 years at rest was 58.7 ± 0.5 cm at the age of 7 years, 65.4 ± 0.5 cm at the age of 8 years, 70.6 ± 0.7 cm at the age of 9 years. age was found to be 78.7 ± 0.4 cm.

It was found that the rate of increase in the length of the chest circumference in schoolchildren increased by 20.0 cm at the age of 7-10 years, by 6.7 cm at the age of 7-8 years, by 5.2 cm at the age of 8-9 years, and by 8.1 cm at the age of 9-10 years.

In observations, the average length of the chest circumference in schoolchildren was 60.7 ± 0.5 cm at the age of 7 years, 68.8 ± 0.4 cm at the age of 8 years, 76.4 ± 0.5 cm at the age of 9 years. age was found to be 82.2 ± 0.6 cm.

The rate of increase in the value of the circumference of the chest at the age of 7-10 years is 21.6 cm at the age of 7-10 years, 8.1 cm at the age of 7-8 years, 7.6 years at the age of 8-9 years. cm, and at the age of 9-10 years it increased by 5.8 cm.

In the case of maximal exhalation of students aged 7–10 years, the average value was 57.0 ± 0.6 cm at the age of 7 years 64.3 ± 0.4 cm at the age of 8 years 69.5 ± 0.5 cm at the age of 9 years 74.4 ± 0.6 cm.

It was found that the increase in the value of the circumference of the chest among schoolchildren was 17.4 cm at the age of 7-10 years, 7.3 cm at the age of 7-8 years, 5.2 cm at the age of 8-9 years, and 4.6 cm at the age of 9-10 years.

Based on the results of the study, it can be seen that the values of anthropometric indicators (body weight, height, chest circumference) studied in primary school girls №30-located in Andijan increased linearly between the ages of 7–10 years.

CONCLUSION

The study of physical development of children aged 7-10 years is of great importance in determining the level of health of the younger generation. Based on the results of our research, we can draw the following conclusions.

1. Body weight is increasing dynamically with age. The difference between 8-9 years is statistically inevitable ($r < 0.05$).
2. The overall length of the neck is also based on the laws of growth and development, and is increasing with age. The differences between 9–10 years were significant and statistically unavoidable ($r < 0.01$).
3. Age-related increases in chest circumference were observed in all three cases (at rest, deep breathing, and deep breathing) with age-related differences. and can be clearly seen in cases of deep breathing.
4. As a result of the above analysis, it can be seen that the growth dynamics between the ages of 9 and 10 is clearly visible in all indicators. This means that growth and development are accelerated between the ages of 9-10 and 7-8 years.

SUGGESTION

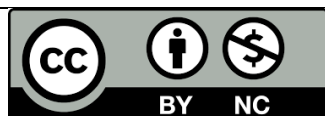
As we continue to analyze our findings and follow up, we would suggest that we continue to conduct regular surveys to find out the level of preventive health of young school-age children.

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Characterization and Expression of Immune Related Genes in Feral Colonies of *Apis* Species from Bengaluru



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ABSTRACT: Eco-immunological studies on feral organisms can throw insights into how host–pathogen dynamics fluctuate with selective pressure from human interventions and other natural infestations. Feral colonies are more susceptible to pathogen attack than the managed bees, in the absence of disease treatments. During the study tried to investigate the role of pathogen infections [Deformed wing virus (DWV) and *Nosema ceranae*] and gene expression of immune members (defensin-1, hymenoptaecin, pgrp-1c, pgrp-s2 and argonaute- 2) in the survival of feral bee colonies across seasons (winter and summer). We surveyed a total of 90 feral colonies over a 3-year period (2018–2021), measuring the pathogen levels and immune gene expression using quantitative polymerase chain reaction (qPCR). Our results confirmed of the positive upregulation of the immune gene members in winters where pathogen loads are found to be more. Higher pathogen levels seem to be associated with increased immune gene expression across all the species in the study. There was no significant effect seen among species, but significant effect was seen across the seasons ($p < 0.05$). Our results could help in suggesting the possible indicator genes to assess the overall health of honey bee colonies and provide evidence for the role of feralization in how they cope up with pathogen landscapes.

KEYWORDS: *Apis cerana*, feral colonies, Immune related genes, Real time PCR.

INTRODUCTION

Eco-immunology studies of wild organisms can provide valuable information on how host-pathogen dynamics change as organism's transition from human-managed conditions. To nature. Honey bees provide an ideal system for studying these questions, as these social insect colonies often escape management and become established in the wild. While managed honey bee colonies have a low probability of survival in the absence of disease treatments, wild bee colonies often persist in the wild, where pathogen pressure is thought to be higher due to lack of treatment. Disease treatment.

Domesticated organisms restore themselves to the wild without anthropogenic influence through the process of feralization (Gering *et al.*, 2019a). Research on feralization typically takes place in a genetic and ecological context, understanding how environmental factors and genetic mutations affect how well feral organisms can compete with domesticated alternatives. According to some research, domesticated plants and animals show reduced fitness upon reintroduction to the wild due to genetic bottlenecks and artificial selection (Araki *et al.*, 2009; Meyer and Purugganan, 2013). Despite this, feral species (e.g., cats, dogs, pigs) thrive, and they do not always revert to the wild (Taylor *et al.*, 1998; Bellard *et al.*, 2017). It is important to note that feral species often outnumber their wild counterparts, which may alter ecosystem composition by increasing competition for prey resources and potentially spreading pathogens to wild species (Bevins *et al.*, 2014). Due to the effect of the wild on conservation biology and surroundings management, there's a developing hobby in those environmental impacts.

Environmental conditions in wild running can promote disease tolerance or resistance. Domesticated pathogens are usually controlled by humans to avoid the rapid spread of disease among livestock. In contrast, transmission of pathogens in wild populations is uncontrolled. Under these conditions, host–pathogen interactions in feral populations may therefore facilitate the rapid evolution of natural mechanisms of disease tolerance or resistance (Locke, 2016). Thus, while the maintenance of traits associated with disease resistance may be impaired in domesticated species, the greater ability to mitigate the negative effects of pathogens is critical to the survival of wild organisms. (Moreira *et al.*, 2018).

During feralization, honey bee colonies (*Apis*) offer a surest version to check the speculation that not only improves bodily defences and disorder but also tolerance among the feral bees. There are a number of pests and pathogens that threaten honey

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bee populations, both domesticated and feral (McMahon *et al.*, 2016). *Varroa destructor* is an ectoparasitic mite that acts as a vector for multiple bee-infecting RNA viruses, and is an important cause of disease and colony losses in honey bee colonies (Martin *et al.*, 2012). In managed colonies of honey bees, chemical acaricides are frequently used to decrease the number of *Varroa* mites and associated viruses. Because *Varroa* mites positively affect honey bee survival, managed colonies are usually treated multiple times per year with acaricides to control mites. In general, honey bee colonies which are not treated or managed die in less than one year (LeConte *et al.*, 2010). Reports states that feral bees survive for long in the wild even though they are devoid of beekeeper management (Locke, 2016).

Studies have confirmed that feral colonies show higher immune response than those of managed colonies (Youngsteadt *et al.*, 2015). We do not know, however, if different immune phenotypes are associated with colony survival under managed or feral conditions, or with resistance to parasites. Management likely has an effect on both types of defences used by honey bees to protect themselves from pests and pathogens (Taric *et al.*, 2020).

Individual bees also rely on humoral immunity to control infections and provide pathogen defence (McMenamin *et al.*, 2017) along with behavioural responses to infection (McMenamin *et al.*, 2018). When the immune system responds to viruses, bacteria, and fungi, several immune pathways are activated. Antimicrobial peptides (AMPs) such as Toll and Imd, e.g., are produced by multiple immune pathways in insects (Brutscher *et al.*, 2015). As a form of antiviral defence, RNA interference (RNAi) targets double-stranded RNA that results from virus replication (Gammon and Mello, 2015).

Here, we tried to investigate the role of pathogen infections and immune gene expression in the survival of feral bees to hypothetically conclude whether feral colonies could serve as reservoirs of pathogens and do increase in pathogen levels lead to higher expression of immune genes in feral colonies. Over a 3-year period, we sampled feral colonies in the same landscapes with the participation of beekeepers at different seasons (summer and winter).

We collected individuals from a total of 90 colonies during winter and summer seasons for a period of 3 years (2018-2021) in order to assess the Eco immunology and pathogen loads among the feral colonies out of which 72 colonies were found to be infested with the pathogen loads. We studied the expression of immune gene members among the feral colonies of *Apis* species (*A.cerana*, *A.dorsata* and *A.florea*).

METHODS

The study was conducted in and around Bangalore district and feral colonies were used for the study. Feral colonies were selected and used for the study at different seasons and habitats. November to January was considered as winter season and March to May was considered as summer season. The number of colonies was not uniform throughout the study, due to the loss of the colonies in the particular habitats. At an average about 5 colonies (n=5) were selected for each species (*Apis cerana*, *Apis dorsata* and *Apis florea*) at different seasons and habitats. Study was conducted for 2018-2021 for both the seasons mentioned.

Table 1: Table showing different habitats and the vegetation chosen for the study.

B: Botanical garden; PP: Public parks; I: Industrial area; MF: Micro forests;
R: residential area.

S.No	Code	Vegetation
1	B	Large canopy trees, orchids, weeds, herbs and shrubs
2	PP	Trees, herbs shrubs, grass and weeds
3	I	Large canopy trees, shrubs weeds and herbs
4	MF	Trees, herbs, shrubs, weeds and grass
5	R	Few canopy trees and shrubs

We approximately sampled 20 forager bees from the entrance of each colony in both the seasons (summer and winter). All the feral bee individuals were sampled with sweep nets and transferred into 50ml tubes and incubated on dry ice to preserve the quality of RNA. Further the samples were stored at 80°C. All the sampling sites were on private property and prior permission was obtained from the site owners and no protected or endangered species were involved in the study.

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IMMUNE GENES AND PATHOGENS ARE USED IN THE STUDY

To distinguish the disease dynamics in the feral bee colonies, we quantified about two pathogens which commonly infect these feral bees and negatively impacting the overall health of colony. Deformed wing virus (DWV) is an RNA virus which is said to be seriously detrimental for the bee resulting in overwintering losses (Brutscher et al., 2016). This is mostly transmitted by *Varroa* mites leading to clinically symptomatic infections (Möckel et al., 2011). Also quantified *Nosema ceranae* (D'Alvise et al., 2019) is a common microsporidian gut parasite of honey bees causing reduced lifespans among the infected bees (Goblirsch, 2018). We quantified both these pathogens in all colonies sampled in the study.

About 5 immune gene members (argonaute-2, pgrp-s2, pgrp-lc, defensin-1 and hymenoptaecin) expression was quantified in feral colonies. The gene argonaute-2 (ago2) always was upregulated at viral infections (Brutscher et al., 2015). Gene *pgrp-s2* and *pgrp-lc* encodes for an upstream recognition receptor involved in activation of the Toll immune pathway and a transmembrane protein activator of the Imd (Immune Deficiency) pathway respectively. Both these genes are reported to be highly upregulated on infection (Evans et al., 2006; Brutscher et al., 2017). Also, we quantified genes defensin- 1 (*Def1*) and hymenoptaecin (*Hym*) produced by the Toll and Imd pathways. These type of antimicrobial peptides (AMPs) are said to play a critical role in honey bee immune responses to viruses and fungal pathogens (Yi et al., 2014).

Table 2: Table showing the gene members used in the expression study with accession numbers.

Gene Name	<i>Apis Cerana</i>	<i>Apis Florea</i>	<i>Apis dorsata</i>
<i>ago2</i>	XM_017065143.2	XM_031915808.1	XM_006624947.2
<i>Hymenoptaecin</i>	XM_017049926.1	XM_012495676.2	XM_031511975.1
<i>defensin-1</i>	LC331613.1	XM_003693866.3	XM_006622512.2
<i>pgrp-lc</i>	XM_017059285.2	XM_031916044.1	XM_006618665.2
<i>pgrp-s2</i>	XM_017066698.2	XM_003694445.3	XM_031509863.1
<i>elongation factor 1-alpha</i>	XM_017065469.2	XM_012490645.2	XM_006621994.2

RNA Extraction: About 10 bees were collected from each colony and used for the total RNA extraction. The abdomens were dissected and were pooled into 2.0ml centrifuge tubes and homogenized using a homogenizer (Eppendorf) at 6.0m/s for three 30s intervals. The RNA was then extracted from the homogenate using RNeasy spin columns (QIAGEN, Hilden, Germany), according to the manufacturers protocol and eluted into nuclease-free water. Using Nanodrop spectrophotometer assessed the quality and quantity of RNA. We then quantified the 2 pathogens and the expression of 5 immune genes through quantitative reverse-transcriptase PCR (qRT-PCR) using previously developed primer sequences (**Table 1**). According to the manufacturer's protocol (Applied Biosystems, Foster City, CA, United States) the three RNA extracts from pooled individuals per colony were individually used as templates to produce cDNA using random primers and MultiScribe RT.

cDNA synthesis: cDNA synthesis was performed using the RT-PCR kit using SuperScriptTMIII Reverse Transcriptase, 200 U μ LG1 (HiMedia). About 2 μ g of the RNA (RNA concentration 1.88 μ g/ μ L) obtained in the previous section was used as the starting reaction. So, it used about 1.23 μ L of the total RNA along with random primers and 1 μ L of RT enzyme. The contents were mixed thoroughly and incubated at 25°C for 10 min. Following incubation at 70°C for 45min. The cDNA thus obtained was then stored until further use for gene expression.

Quantitative real time PCR: Quantitative RT-PCR assay was performed on cDNA templates, using Realplex 4 (Eppendorf) and SYBR Green PCR master mix (Biorad) according to the manufacturer's recommendations (BioRad) with the designed primers listed in Table 1. cDNA samples obtained in the previous section were used as template in the qPCR.

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Table 3: Table showing the list of primers used in the study. *elongation factor 1-alpha* was used as housekeeping gene in the study.

Gene Name		(5'→3')	Length	Tm	GC%	Product Length
<i>ago2</i>	FW	TTGGTGCAGACGTGACTCAT	20	59.83	55	450
	RV	TTGGATCGTGACTTGCTGCT	20	57.95	55	
<i>hymenoptaecin</i>	FW	ACAATGGATTATATCCCGACTCGT	24	60.04	55	189
	RV	CAATGTCCAAGGATGGACGAC	21	60.04	58	
<i>defensin-1</i>	FW	GGCTGCACCTGTTGAGGAT	19	59.14	55	630
	RV	TGTCCTTTGAATGAGAGAAGGTCA	24	59.97	55	
<i>pgrp-1c</i>	FW	TCCGTCAGCCGTAGTTTTTC	20	59.67	55	386
	RV	CGTTTGTGCAAATCGAACAT	20	60.04	50	
<i>pgrp-s2</i>	FW	TTGCACAAAATCCTCCGCC	19	59.73	55	246
	RV	CACCCCAACCCTTCTCATCT	20	57.91	55	
<i>elongation factor 1-alpha</i>	FW	GGAGATGCTGCCATCGTTAT	20	58.23	55	249
	RV	CAGCAGCGTCCTTGAAAGTT	20	59.11	55	
<i>DWV (virus) (Ryabov et al. (2014))</i>	FW	GTTTGTATGAGGTTATACTTCAAGG	25	58.76	55	245
	RV	GCCATGCAATCCTTCAGTACCAGC	24	59.12	58	
<i>Nosema ceranae (Fungus) VanEngelsdorp et al. (2009)</i>	FW	CAATATTTTATTATTTTGAGAGA	23	60.11	55	186
	RV	TATATTTATTGTATTGCGCGTGCA	24	58.96	50	

Amplification of all the gene members along with house keeping gene (*elongation factor 1-alpha*) was performed in a 25µl reaction using iQTM SYBR Green Supermix (Genei) containing 2.5µl of 10× PCR buffer with SyBr green, 2.5µl of 10mM dNTPs, 10pmoles/µl of each primer, 10.4µl of PCR water, 0.1µl of 5U Taq polymerase (Genei), and 2µl of cDNA [Malla Sudhakar, 2020]. *elongation factor 1-alpha* was used as housekeeping gene throughout the study (Lourenço *et al.*,2008).

The amplification conditions for cDNA of *ago2*, *defensin-1*, *pgrp-1c*, *pgrp-s2* were 95°C for 10min for initial denaturation, followed by 35 cycles of amplification at 95°C for 30sec, 58°C for 40sec, and 72°C for 50sec. A final extension at 72°C for 10min was followed at the end of the run. All the samples were run in Duplicates and samples with no cDNA served as negative control.

The amplification conditions for cDNA of *hymenoptaecin*, *elongation factor 1-alpha*, *DWV (virus)* and *Nosema ceranae (Fungus)* were 93°C for 10min for initial denaturation, followed by 35 cycles of amplification at 93°C for 45sec, 61°C for 50sec, and 73°C for 45sec. A final extension at 73°C for 10min was followed at the end of the run. All the samples were run in Duplicates and samples with no cDNA served as negative control. The relative expression of the target genes in the different samples were calculated according to the following formula: $\Delta Ct = Ct(\text{target gene}) - Ct(\text{housekeeping gene})$ where Ct (target gene) indicates the value of the threshold cycle for the gene of interest, and Ct (housekeeping gene) indicates the value of the threshold cycle for the housekeeping gene used as normalizer.

And the relative expression of all samples was calculated as follows: $RE = 2^{-\Delta\Delta Ct}$ [where $\Delta\Delta Ct = \Delta Ct(\text{sample}) - \Delta Ct(\text{control})$] where RE indicates the relative expression, $\Delta Ct(\text{sample})$ indicates the difference between Ct values of the target gene and the housekeeping gene(s) calculated for the test sample, $\Delta Ct(\text{control})$ indicates the difference between the Ct values of the target gene and the Ct values of the housekeeping gene(s) obtained from the corresponding with control [Sudhakar Malla, 2020].

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RESULTS AND DISCUSSION

Pathogen Levels

Our study states that mean DWV levels were significantly higher in feral colonies in winter than in summer at all years ($P < 0.05$). Levels of DMV was found to be significantly more than the *N. ceranae* throughout the study. All the colonies tested positive for the presence of DWV and *N. ceranae* at all timepoints but significantly higher during the winter than summer. Out of the 72 colonies tested, *N. ceranae* was detected in about 58 feral colonies and DMV was detected in 61 feral colonies.

A two-way ANOVA between the seasons and species was conducted to compare the DMV prevalence. There was a significant effect of the prevalence between the seasons remembered at the $p < 0.05$ level. The significance effect of the seasons on the DMV prevalence was reported to be $[F(5,17) = 96.4889, p = 2.86E-05]$. However, there was no significant effect of DMV prevalence among the species $[F(2,17) = 60.722, p = 0.136807]$. There was a significant effect of the prevalence among the species remembered at the $p < 0.05$ level.

A two-way ANOVA between the seasons and species was conducted to compare the *N. ceranae* prevalence. There was a significant effect of the prevalence between the seasons remembered at the $p < 0.05$ level. The significance effect of the seasons on the *N. ceranae* prevalence was reported to be $[F(5,17) = 611.122, p = 0.000358]$. However, there was no significant effect of *N. ceranae* prevalence among the species $[F(2,17) = 120.0556, p = 0.11966]$. There was a significant effect of the prevalence among the species remembered at the $p < 0.05$ level.

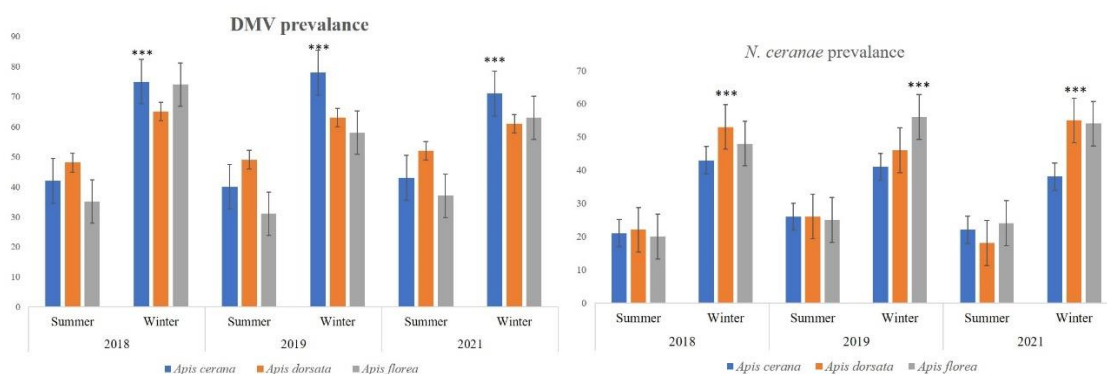


Figure 1: Graph showing the pathogen prevalence of DMV and *N. ceranae*. Prevalence of pathogens in feral colonies. Deformed wing virus (DWV) and *N. ceranae* were detected in all colonies at all times of sampling ($P < 0.05$). All the values are average of triplicates. Values are expressed as mean \pm SD.

Real time PCR:

From the real time quantification, we show that overall feral bee colonies have higher levels of DWV and fungal parasite (*N. ceranae*) loads which was seen across the seasons, but significantly lesser load than the winter ($P < 0.05$). Though we didn't study the mode and way of transmission of these two pathogens, but still we could find feral bees, could serve as reservoirs for DWV and *N. ceranae*. We found a strong correlation between the gene members and seasons, which was obvious from the loads of pathogens ($p < 0.05$). Almost all the gene members got over expressed in winter seasons more than the summer seasons. This was uniform across the years of study. We also found higher immune gene expression in feral colonies across the winter seasons even at time points when DWV levels are almost similar.

Specifically, we found hymenoptaecin was highly expressed in winter seasons, where the supposed parasite load was higher in winters than in summers. Many studies report that this gene expression is strongly correlated to increased colony survival (Wu *et al.*, 2020). Hymenoptaecin is generally considered as a good AMP which protects the host from harmful pathogens like DWV and *Varroa* mites (Kuster *et al.*, 2014) reported that this gene was stably over expressed when bees were exposed to pathogens and wounding events (Galbraith *et al.*, 2015). Hence from our study and other previous reports, we could strongly suggest this gene to be used as biomarker of honey bee health.

Further analysis of gene members also revealed that levels of defensin and Ago2 also were positively correlated to the expression of hymenoptaecin in the winter seasons. The strength of correlations was high which might be again due to genetic features and environmental conditions which decide the phenotype of an individual. Both defensin and Ago2 genes were found to be positively over expressed ($p < 0.05$) with the parasite load, suggesting of their role in immune protection. Both these genes

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were identified to be differentially expressed in bees with virus infestation, which is again a positive correlation to the hosts reduced host mortality (Ryabov *et al.*, 2014). Though we didn't relate our study to the survival rates of the colonies, still our data suggests of the strong role of the gene members in expression, while the host is under viral stress.

PGRP-LC and PGRP-s2 were also over expressed in winter season alone, which is again in accordance to our previous findings. But interestingly, the expression levels seem to be more or less similar for the member, PGRP-s2 wherein the levels seem too low or negligible ($P < 0.05$). No reports were observed on similar findings of these gene members, and needs further correlation study and validation.

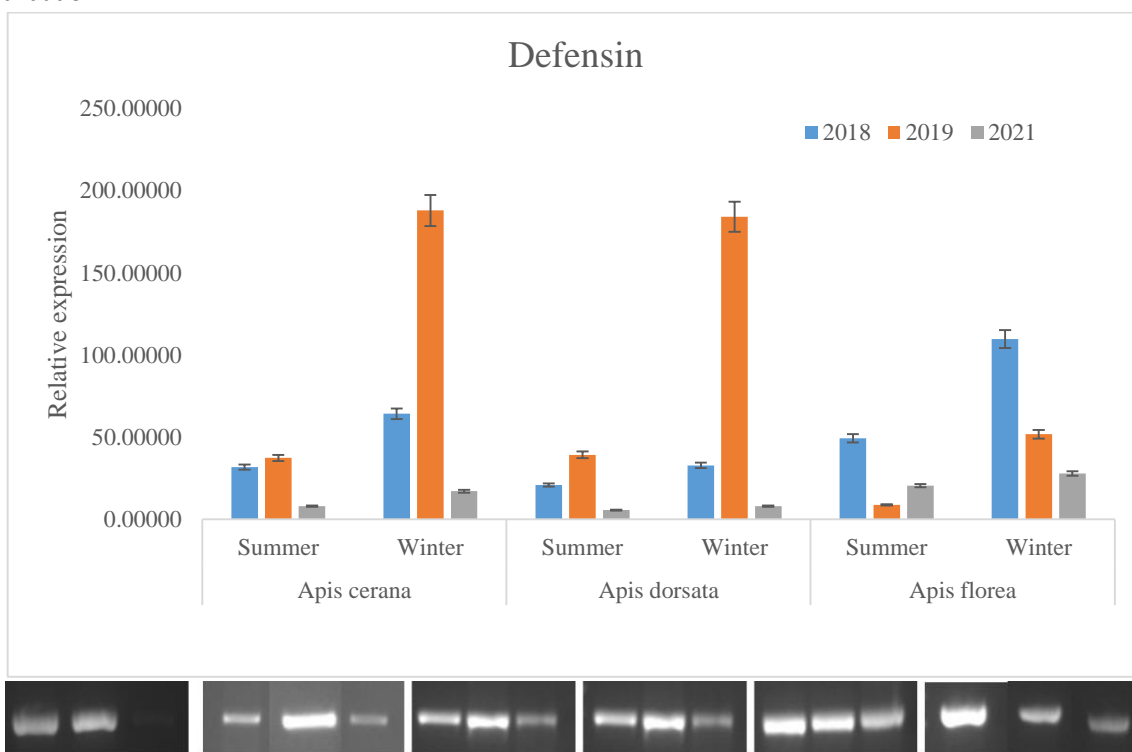


Figure 2: Relative expression levels of defensin gene member across the seasons and among the species. All the values are average of triplicates. Values are expressed as mean \pm SD. 1.2% agarose gel with the expressed gene members can be seen in the below image.

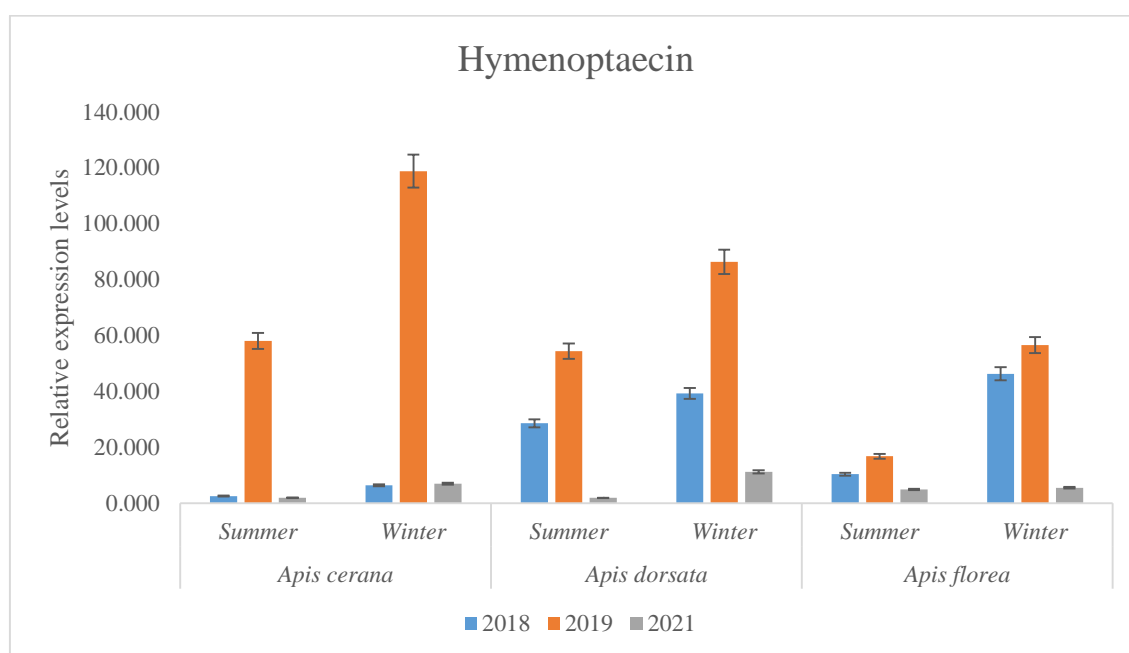


Figure 3: Relative expression levels of hymenoptaecin gene member across the seasons and among the species. All the values are average of triplicates. Values are expressed as mean \pm SD.

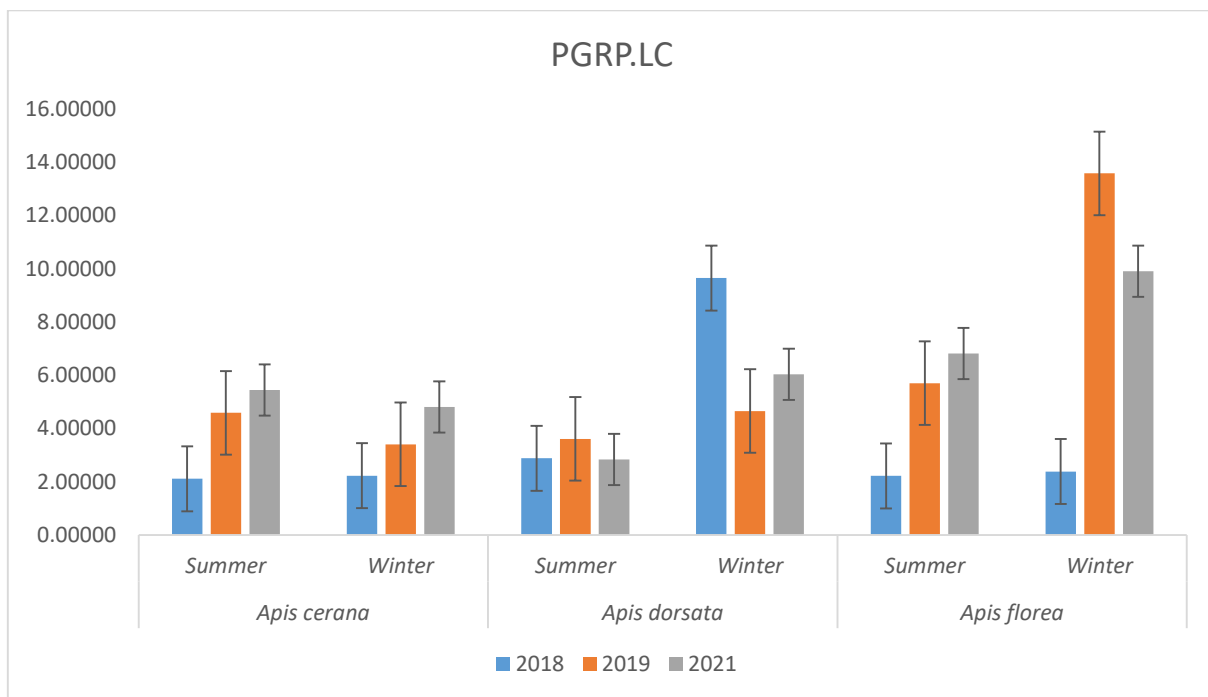


Figure 4: Relative expression levels of *PGRP.LC* gene member across the seasons and among the species. All the values are average of triplicates. Values are expressed as mean ± SD.

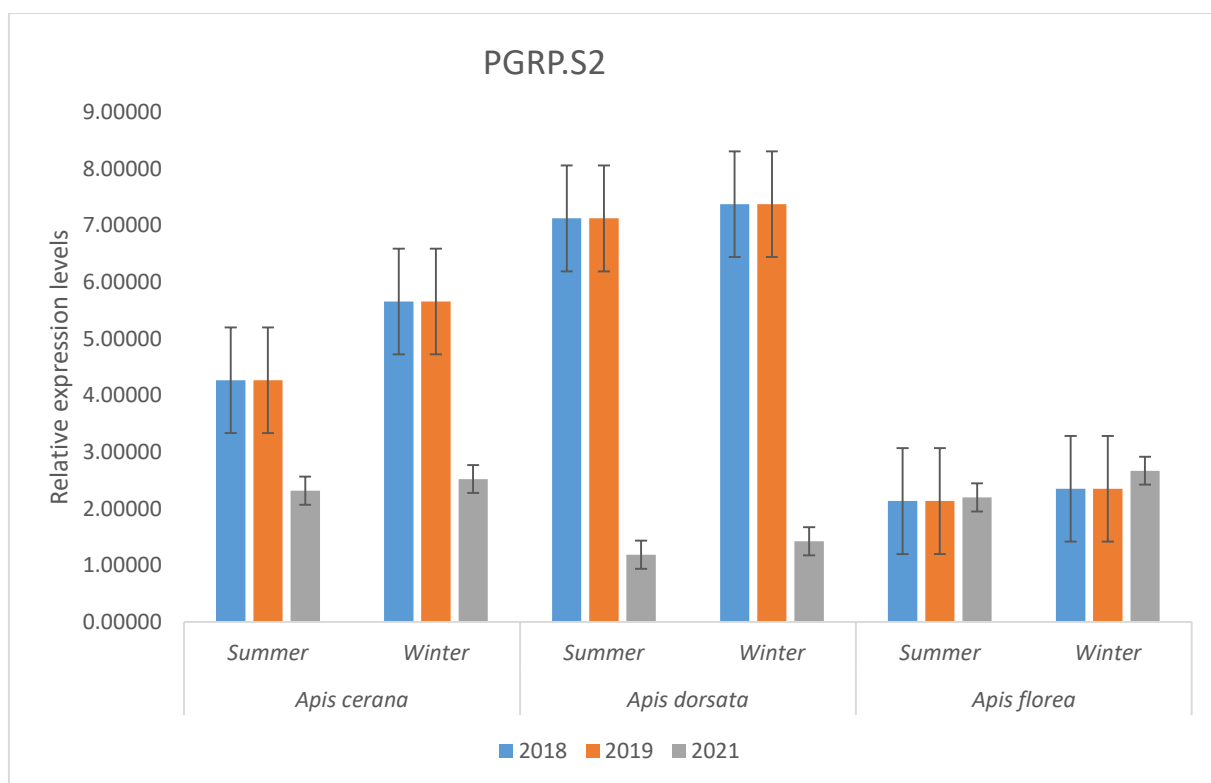


Figure 5: Relative expression levels of *PGRP.S2* gene member across the seasons and among the species. All the values are average of triplicates. Values are expressed as mean ± SD.

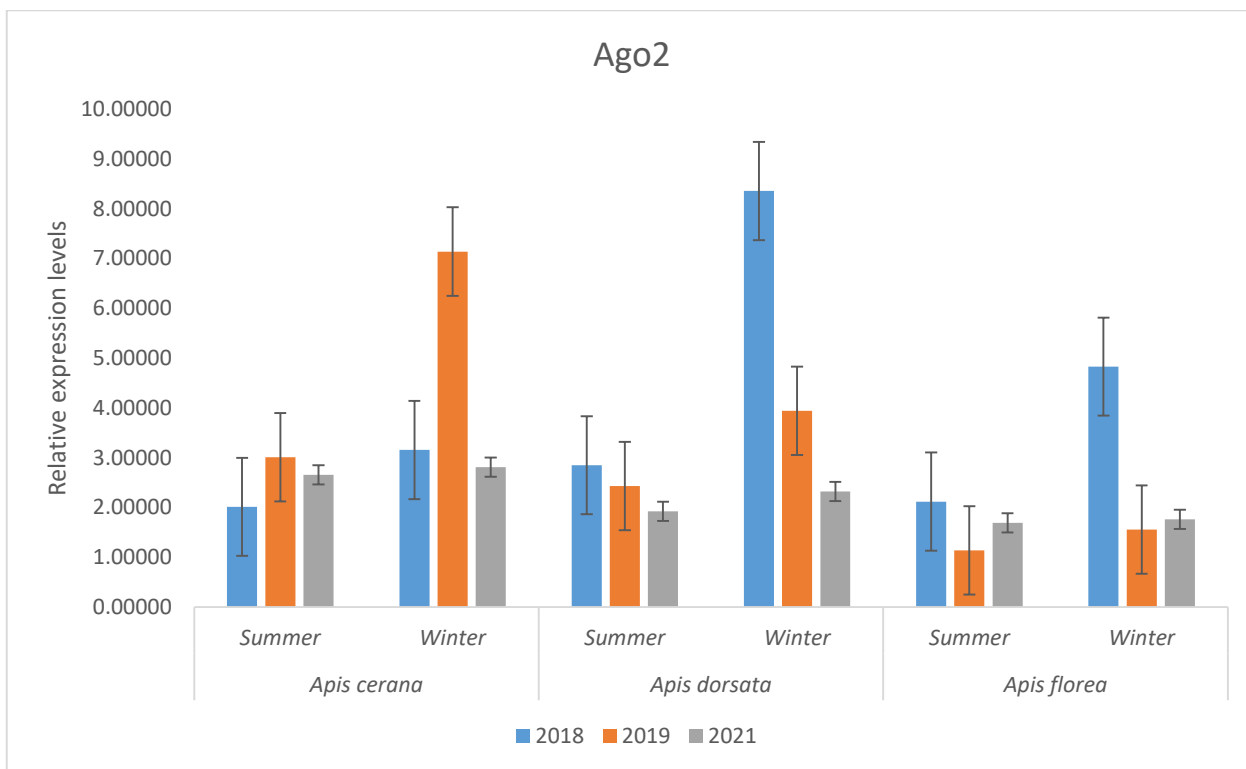


Figure 6: Relative expression levels of Ago2 gene member across the seasons and among the species. All the values are average of triplicates. Values are expressed as mean ± SD.

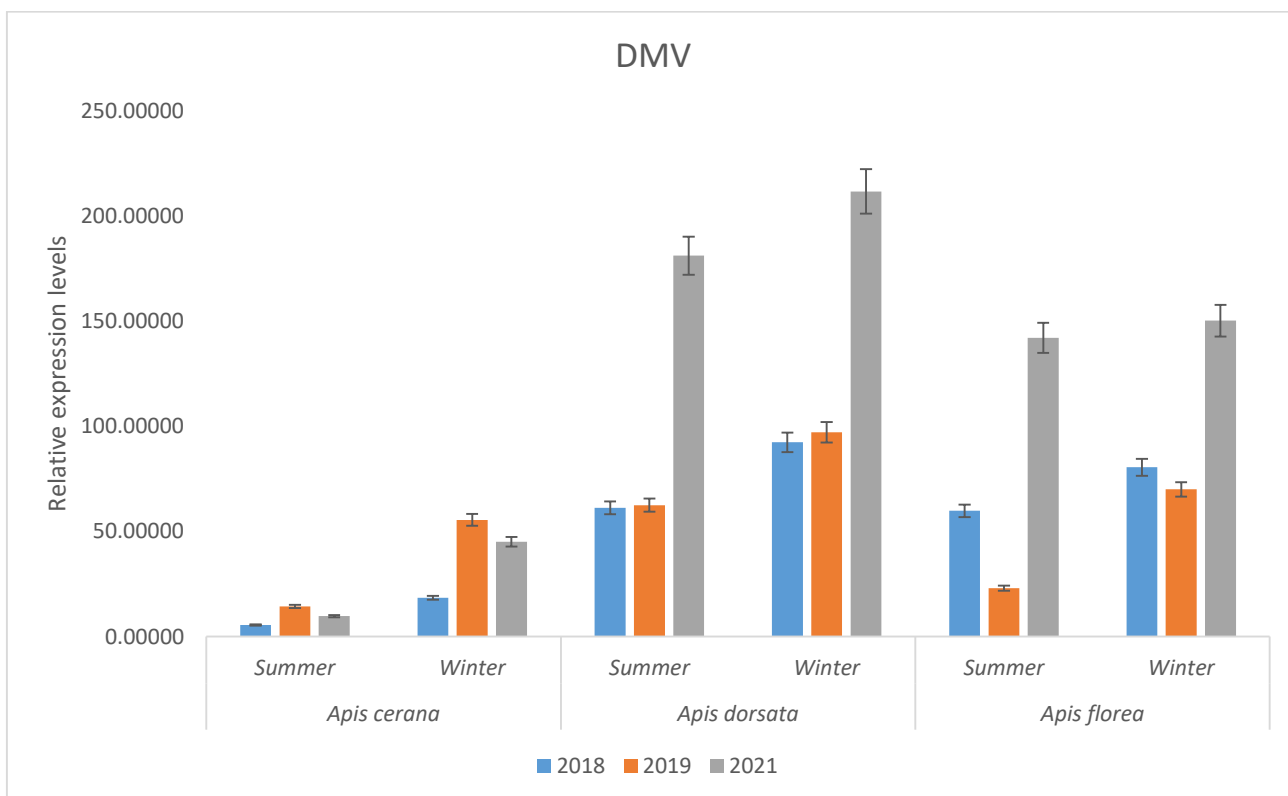


Figure 7: Relative expression levels of DMV gene member across the seasons and among the species. All the values are average of triplicates. Values are expressed as mean ± SD.

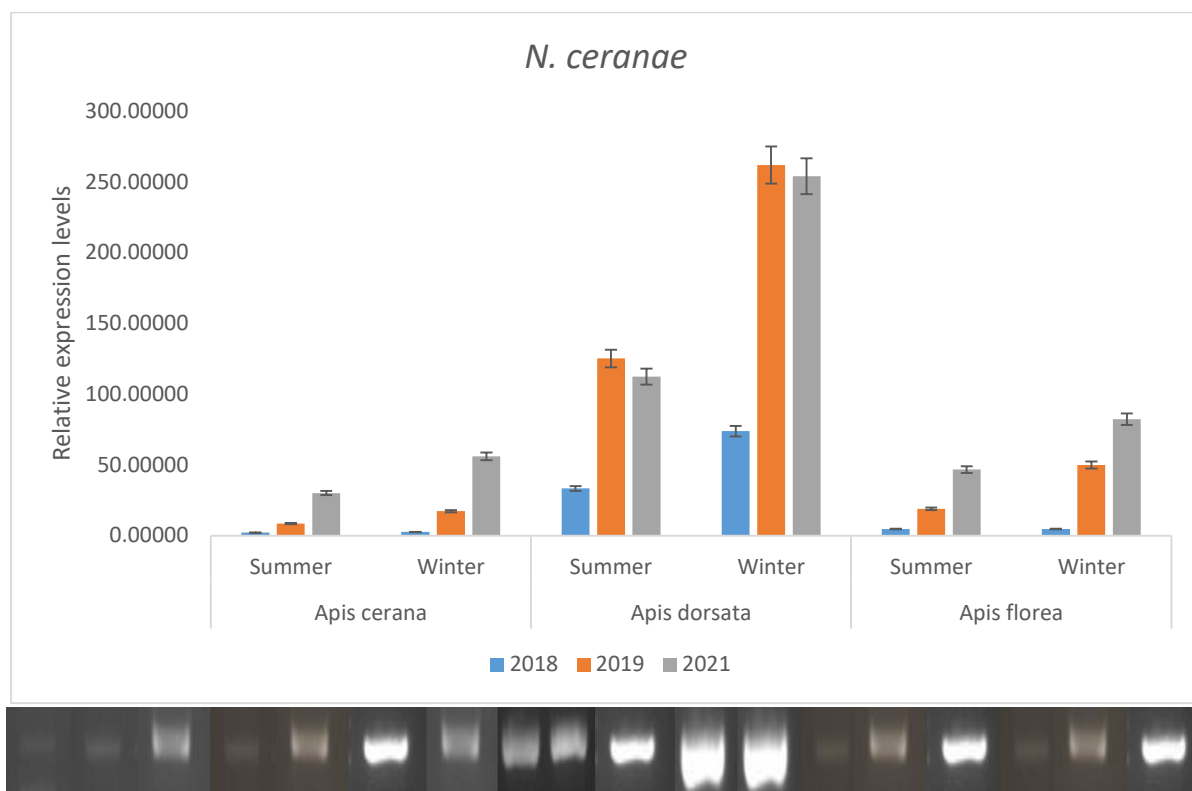


Figure 8: Relative expression levels of *N. ceranae* gene member across the seasons and among the species. All the values are average of triplicates. Values are expressed as mean \pm SD. 1.2% agarose gel with the expressed gene members can be seen in the below image.

CONCLUSION

Feral bees offer a great and valuable model to investigate the potential negative consequences of domestication and other human interventions. This could aid us in interpreting the host–pathogen interactions. Undoubtedly, a host manages its gene member’s expression in timely manner and of course when in need. On infestation, a host stimulates its immune system to over express some of the genes which could help them to cope up with the infection. We found the gene members like hymenopaectin, ago2, PGRP-LC, PGRP-s2 and defensin to be strongly upregulated with high loads of parasite. In our study, we found higher loads of parasite infection in winter season than the summer season, and a correlation could be seen between the season load of infection and immune gene member’s upregulation.

Feral colonies were obviously more susceptible to pathogen infection due to low maintenance of pesticides and treatment. As such these feral bees have their own way of handling these infections. Here, we quantified the pathogen levels along immune gene expression and confirmed the positive correlation between the components. Our study also strongly suggests to use these gene members as indicators for estimating the overall bee health. This could surely help us breeding efforts and focus more towards increasing these traits in selected honey bee stocks, this could decrease the overall colony losses for the beekeeping industry. This study could also pave ways to understand the role of feralization on pathogen dynamics and Eco immunology among the managed species.

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Assessment of Genetic Diversity Index in Feral Colonies of *Apis* Species within Different Eco-Habitats of Bengaluru



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ABSTRACT: The objective of our study was to screen the extent of genetic variability and phylogenetic relations among the three kinds of honey bee species from Bengaluru at different habitats. The Asian honey bee species i.e., *Apis cerana indica*, *Apis dorsata* and *Apis florea* collected from Bengaluru were studied by using partial sequences from two mitochondrial genes (i) the Cytochrome c oxidase-I (COI) and (ii) the mitochondrial encoded NADH dehydrogenase 5 (NADH5). We then compared their sequences with already submitted sequences from national centre for biotechnology information (NCBI) to deduce the genetic variations among the species. We also studied the rate of mutations across the species by polymorphism studies. The amplified sequences were analysed for evolutionary genetic analysis using neighbor-joining method and Kimura 2-parameter model. Our study confirmed that, there was less genetic variability in *A.florea* species which might be due to its selective pressures. *A.cerana indica* on the other hand was found to consists of more mutations. Throughout our study we found bees within the residential areas showed significant mutation rates than the other habitats which was seen among all the three bee species. Though the significant effect was not remarkable, but still this variability could answer many of the genetic problems of existing and evolving in harsh conditions.

KEY WORDS: *Apis florea*, *Apis cerana indica*, *Apis dorsata*, phylogenetic tree, Genetic variability, Polymorphisms

INTRODUCTION

In biology, diversity refers to the variety of organisms that live on all types of surfaces, including terrestrial, marine, and aquatic ecosystems (Harper and Hawksworth, 1994). Ecosystem diversity includes the diversity within and between species. The concept of biological diversity describes all the organisms and their complex ecological relationships within the environment, as well as all ecological processes that contribute to these organisms (Primack,1993).

Organisms are often identified by DNA barcoding. During this procedure, mitochondrial DNA of the COI gene is amplified and sequenced. Nucleotide sequences obtained from the Genome Database and Bold system are compared to those deposited in the databases. While highly conserved in the same taxon, this DNA fragment varies greatly between taxa. While DNA barcoding has been widely accepted, its use for the identification of honey bee subspecies has been limited. In addition to their economic, nutritional, and ecological functions (the bees pollinate a wide range of crops and flora), honey bees (*Apis* spp.) deserve a thorough classification. Currently, 10 species of *Apis* have been identified, namely i.e. *A. andreniformis*, *A. binghami*, *A. cerana*, *A. dorsata*, *A. florea*, *A. koschevnikovi*, *A. laboriosa*, *A. mellifera*, *A. nuluensis*, and *A. nigrocincta* (Arias and Sheppard, 2005).

It is possible to study better the genetic diversity and gene pool of insects by using various molecular marker techniques, and this will allow questions about how to distinguish species based on their morphological characteristics to be answered more clearly. Insect ecological studies have mainly employed mitochondrial DNA, random amplified polymorphic DNA, microsatellites, and amplified fragment length polymorphism markers as relevant molecular techniques (Behura, 2006).

Unlike bees which are classified primarily based on morphology, genetic variation is observed by measuring mitochondrial DNA gene segments (Branchiccela *et al.*, 2014; Ostroverkhova *et al.*, 2015), SNPs (Chapman *et al.*, 2016), and allozymes (Smith and Glenn, 1995) to separate races among species. In order to measure the extent of genetic difference between the different honey bee species, molecular analysis is a compelling tool (Meemongkolkiat *et al.*, 2019). Molecular markers, such as mitochondrial genes, are commonly used to study the extent of genetic diversity in insects (Bouga *et al.*, 2011) since mitochondrial genes have ten times the mutation rate of nuclear genes (Ballard and Whitlock, 2004).

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A. cerana, *A. dorsata*, and *A. florea* are native, while *A. mellifera* is imported (Khan, 2020; Sajid *et al.*, 2020; Shakeel *et al.*, 2020). Research on the Asian and western honey bee species found in the country has been very sparse in terms of studies on morphology and molecular biology. Although in honey bee species molecular studies were done based on mitochondrial gene segment i.e., cytochrome c oxidase I (Rizwan *et al.*, 2018) but still polymorphism data was not reported.

The present study was designed to explore the extent of the genetic variability and phylogenetic inference among three kinds of honey bee species (*A. cerana*, *A. dorsata*, and *A. florea*) across five different habitats (Micro-forest, Botanical garden, Residential area, industrial area and public parks) from Bengaluru. Successfully amplified the partial sequence of COI and ND5 from honey bee samples. The amplified fragments were sequenced and analysed using BLASTn and phylogenetic variability along with polymorphisms were screened to assess the number of genetic variations.

METHODS

The three honey bee species i.e., *Apis cerana indica* (the Indian honey bee), *A. dorsata* (the giant/rock honey bee), and the *Apis florea* (Dwarf bee) collected from different habitats in and around Bengaluru were studied using partial sequences from two mitochondrial genes Cytochrome c oxidase I (COI) and NADH dehydrogenase 5 (NADH5) and then sequentially compared with other honey bees sequences from the National centre for biotechnology information (NCBI).

Extraction of genomic DNA: Freshly emerged adult bees were collected from honeycombs and were frozen at -20°C. Body segment thorax was used for the gDNA extraction. Thorax region dissected was placed in a centrifuge tube containing BSA (250 mg/ml) and 3.2mm stainless steel beads (2-3nos). The tissues were then homogenized by a homogenizer. 285µl of 6M NaCl was added to the contents and homogenized thoroughly for 5min. following homogenization, the contents were centrifuged at maximum speed and supernatant was collected [Khalid Ali Khan, 2021]. To the supernatant 3 volumes of 20% SDS was added and vortexed. The contents were then centrifuged at maximum speed for 20min at 4°C. Aliquots of 150µl of cleared supernatant was then added with ice cold isopropanol to precipitate the DNA. The tubes were centrifuged to pellet the DNA and the DNA pellet was dissolved in 10x TE buffer (100mM Tris HCl, 25mMEDTA). Resuspended DNA was then checked for purity in UV spectrophotometer (Shimadzu 1800).

PCR was executed with an Eppendorf MasterCycler Personal cycler. Each PCR reaction mixture contained 2.5µL of 10x reaction buffer (HiMedia), 1µL of 10mM dNTPs, 1µL of 10µM forward primer, 1µL of 10 µM reverse primer, 3µL of 25mM Mg²⁺, 2µg of template DNA, 2.5 units of thermostable Taq DNA polymerase (HiMedia), and deionized water (up to 25µL). PCR regime included initial denaturation at 95°C for 4 min; 35 cycles of denaturation at 95°C for 20s, annealing at 53°C for 45s, elongation at 72°C for 90s; and final elongation at 72°C for 10min.

Table 1: A list of primers used in the study.

Gene Name		(5'→3')	Length	Tm	GC%	Product Length	Reference
COI	FW	GGTCAACAAATCATAAAGATATTGG	20	60.4	50	450	Vrijenhoek, 1994
	RV	TAAACTTCAGGGTGACCAAAAATCA	20	58.7	50		
NADH5 (AD)	FW	ATTCAAATTTGCAACTAAACCA	24	59.8	55	510	Self designed
	RV	GAAACTGTAAAAATAGTTCCAACA	21	59.8	55		
NADH5 (AC)	FW	GAACTGTAAAAATAGTTCCAACA	19	60.2	55	440	Self designed
	RV	GGATGAGATGGTTTAGGATT	24	60.2	50		
NADH5 (AF)	FW	ATGTTGAATAAGCAACAACCT	20	59.67	55	505	Self designed
	RV	GGTTGAGATGGATTAGGATTA	20	59.7	50		

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PCR products were purified from an agarose gel with a Clean-up Standard kit (HiMedia) and sequenced with an Applied Bio systems 3500 genetic analyser using the Big Dye Terminator v3.1 Cycle Sequencing Kit using the same DNA barcoding primers. Sequence alignment was performed with the Clustal Omega tool (The European Bioinformatics Institute, Hinxton, UK, <http://www.ebi.ac.uk/Tools/msa/clustalo>).

A neighbor-joining tree was constructed using the Kimura 2-parameter method [Saitou, 1987] in MEGA7. A phylogenetic tree is drawn to scale, with branch lengths in the same units as those of the evolutionary distances used to infer the phylogenetic tree. Jones-Taylor-Thornton (JTT) model was used in both the cases with Site Coverage Cut-off at 95%. The percentage of duplicate trees in which the related taxa clustered together in the bootstrap test (500 replicates with pairwise deletion of missing/gap data and inclusion of all replacements (transversions and transitions)) are showing in next to the branches. *Apis dorsata* (GI1772614101), *Apis cerana* (GI1619282822) and *Apis florea* (GI1787270937) were chosen as the outgroup.

Genetic diversity: Mitochondrial gene diversity was studied on two gene segments among the three honey bee species in the study and also across the habitats. The study was carried out using the DNA sequence polymorphism Dna SP v 5.10 (Librado and Rozas, 2009).

RESULTS

Three bees of each species at different habitats were initially studied. We performed classical DNA barcoding using the primers specified in the table. We amplified a total of 45 nucleotide sequences which are aligned using the MEGA7 software, to deduce the phylogenetic relation and species confirmation.

For mitochondrial COI gene fragment, there was 98.85% (total score 1543; E value = 0.0–0.0), 96.57% (total score 752; E value = 0.0–0.0), and 99.05% (total score 1203; E value = 0.0–0.0) nucleotide identity for *A. dorsata*, *A. cerana*, and *A. florea* sequences respectively. For mitochondrial ND5 gene fragment, there was 97.85% (total score 1290–1345; E value = 0.0–0.0), 94.55% (total score 734–870; E value = 0.0–0.0), and 98.19% (total score 765–771; E value = 0.0–0.0) nucleotide identity for *A. dorsata*, *A. cerana*, and *A. florea* sequences respectively.

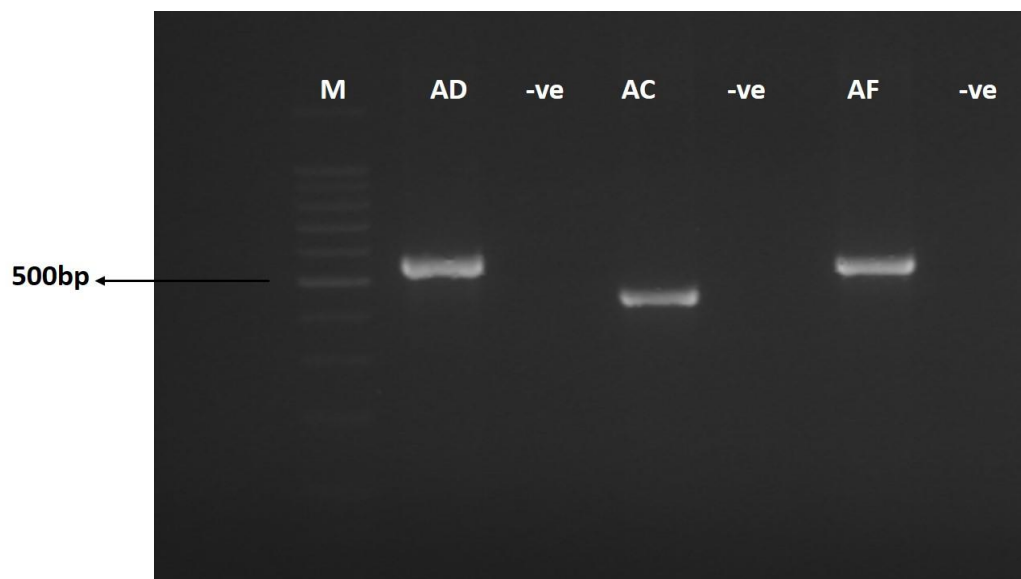


Figure 1: Agarose gel showing the amplified fragments of NADH for the 3 species in the study. AD: *Apis dorsata*; AC: *Apis cerana*; AF: *Apis florea*

The amplified fragments were run on 0.8% agarose gel and showed bands approximately at expected molecular size. The bands were shown at 510, 440 and 505bp for *Apis dorsata*, *Apis cerana* and *Apis florea* respectively [Figure].

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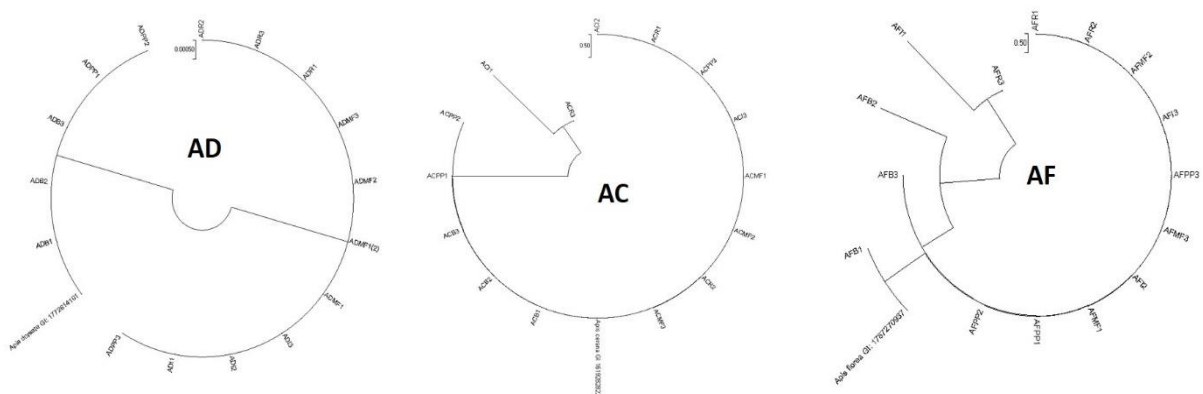


Figure 2: Image showing the evolutionary tree of the DNA sequences using the Neighbor-Joining method [Jones DT, 1992]. The distances were calculated using the Maximum Composite Likelihood method and analysis involved 40 nucleotide sequences. All the gaps and missing data were removed and the final dataset contained about 630, 741, 697 positions for AD, AC and AF respectively. Phylogenetic analyses were done with MEGA7 [Kumar S, 2016]. AD: *Apis dorsata*; AC: *Apis cerana*; AF: *Apis florea*.

Phylogenetic tree: The phylogenetic tree built using MEGA7 showed close relation with their respective strains. *Apis dorsata*, *Apis cerana* and *Apis florea* sequences from NCBI data base were used as reference sequences with their respective counter parts. All the sequences showed similarity without much substitutions stating the minimal variations within the species. This might be due to the narrow range of geographical distribution [Figure 2 and Figure 3].

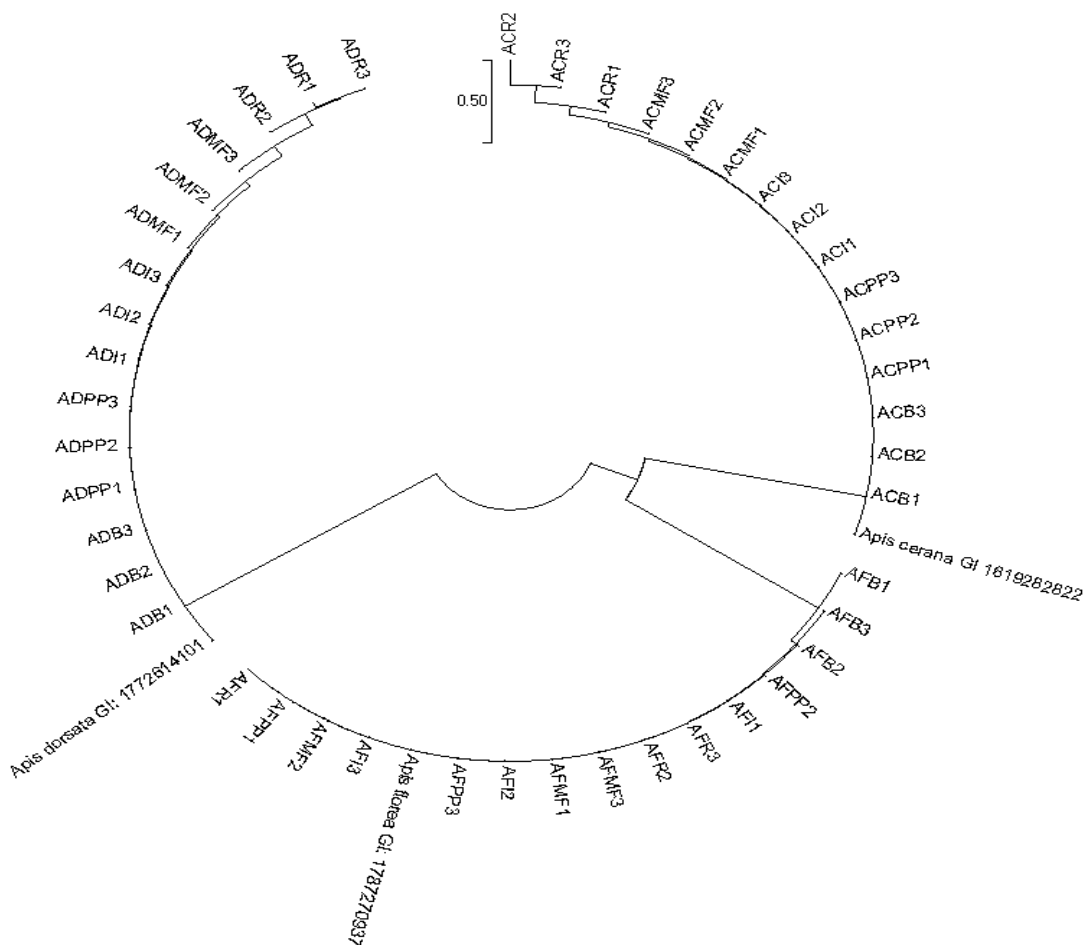


Figure 3: Image showing the evolutionary tree of the DNA sequences using the Neighbor-Joining method [Jones, 1992]. The optimal tree with the sum of branch length = 4.92720112 is shown. The distances were calculated using the Maximum Composite Likelihood method and analysis involved 40 nucleotide sequences. All the gaps and missing data were removed and the final dataset contained about 562 positions in the final dataset. Phylogenetic analyses were done with MEGA7 [Kumar, 2016].

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Genetic diversity among honey bee species: The three honey bee species i.e., *A. cerana* (the Indian honey bee), *A. dorsata* (the giant honey bee), and the *A. florea* (Dwarf bee) collected from different habitats in and around Bengaluru were studied for genetic diversity among the species and also within the habitats. Though the genetic differences were not too high to be marked, but still their existed traces of significant variations across the habitats and species.

On analysing, within COI gene sequences, the highest genetic difference (as seen from Eta value) was found noted in *A. cerana* followed by *A. dorsata* within residential areas showing up to 39 and 31 mutations respectively. This trend was seen across all the habitats and within the species. *A. florea* seems to have a smaller number of variations among all the habitats. The next highest genetic difference (as seen from Eta value) was found noted in *A. cerana* followed by *A. dorsata* within industrial areas showing up to 29 and 25 mutations respectively [Figure 4].

The number of mutations observed were more in residential area followed by industrial area, public park, botanical garden and micro forest. Our results are in accordance to the foraging pattern and immune gene expression data (not shown in this paper). Overall *A. cerana* showed more variations or diversity across all the habitats ($p < 0.05$).

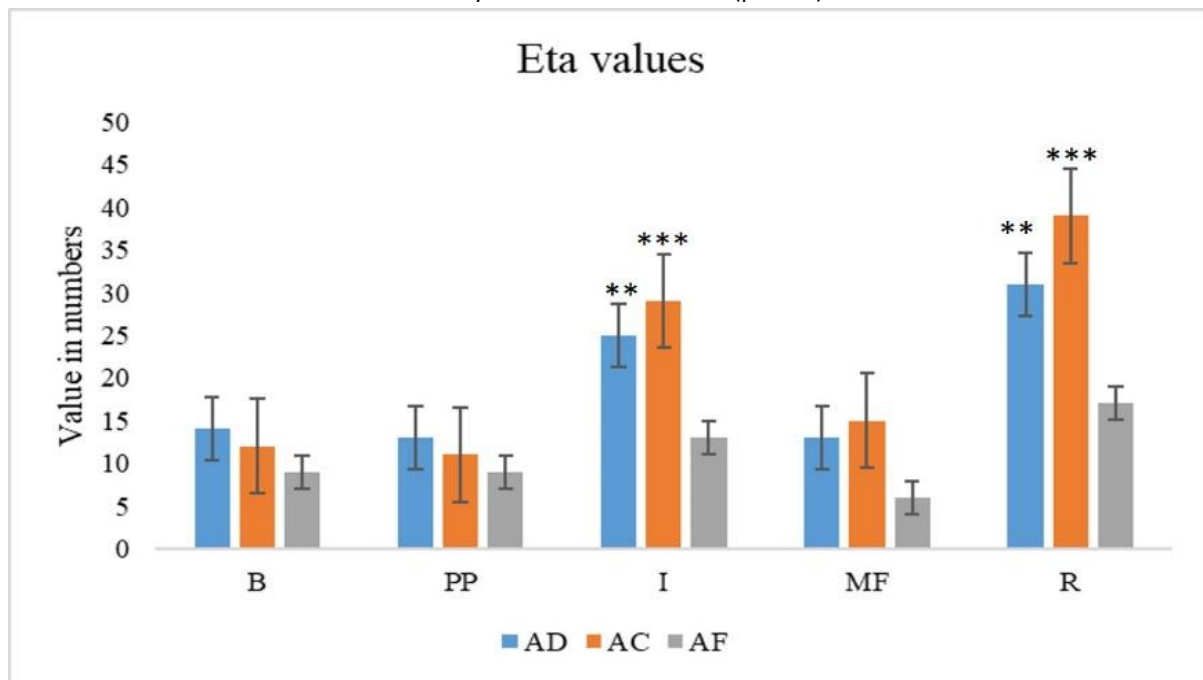


Figure 4: Graph showing the Eta values obtained on analysing genetic diversity across the habitats and species. Eta = Total number of mutations. AD: *Apis dorsata*; AC: *Apis cerana*; AF: *Apis florea*. (n=15 for all the three species studied). Value are represented as value \pm SD. Data was analysed on DnaSP 5.1 (Free ware).

A two-way ANOVA was done to trace the significant effect of mutation rate between the species and habitats. There was a significant effect of the number of mutations between the species and habitats remembered at the $p < 0.05$ level. The significance effect of the mutations on the species and habitats was found to be $[F(2,8) = 152.2667, p = 0.01133]$ and $[F(4,8) = 201.7333, p = 0.002498]$.

DISCUSSION AND CONCLUSION:

Our study identified genetic diversity among the species and within the habitats. We studied on three honey bee species at five different habitats. Our investigation involved amplifying the two gene fragments (COI and NADH5) from the three types of be samples and identifying the genetic variations among them at different habitats. Sequencing studies confirmed of the strains on BLAST analysis and on comparison of the polymorphisms we found *A. florea* showed lessor no mutations when compared to other species. Our previous studies on immune gene expression and foraging patterns also showed similar findings wherein *A. florea* exhibited little changes or response.

Similar works were done by Smith *et al.* (2011), wherein they stated *A. cerana* colonies are more able to survive infestations against pathogens and surroundings. Such healthy systems are going to aid in improving the honey bee colony health. The honey bee, *A. cerana* not only shows greater hygienic behaviour but also is more disease resistant and as such could co-adapt and maintain stability within its genetic content (Lin, 2016). Studies done earlier also reported that, *A. florea* colonies were more resistant and less subjected to pressures from predators. They do not suffer a great loss in terms of habitat loss or colony collapse

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disorders. In other words, environmental influences are too less on *A. florea* species which makes it less vulnerable for colony collapse (Julia, 2007).

Reports from Oldroyd (2006) suggested that, mitochondrial COI genes are mostly used in characterizing the genetic divergence within species. Meixner *et al.* (2013) reported that, this technique is quite useful to infer the bee evolutionary subspecies identification and also of the human mediated intervention. Our work confirmed of the detailed genetic and phylogenetic interactions within the honey bee species found in Bengaluru and among the habitats. Among these *Apis* species, the mitochondrial NADH5 area could aid in solving the interactions among the species. Further confirmation could be done to evaluate the findings with more mitochondrial genes so as to conclude the variations and relationship with their habitats.

ACKNOWLEDGEMENTS

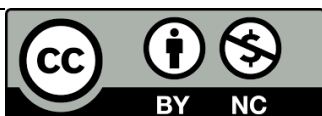
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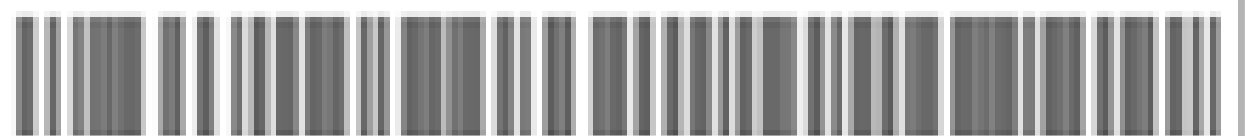
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