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Compliance on Therapeutic Regimen Among Hypertensive Middle-Aged Adults: Addressing Barriers to Medication Effectiveness

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ABSTRACT: Hypertension (HTN), is one of the leading causes of preventable death worldwide, and remains a public health challenge due to low compliance with therapeutic regimens. This study evaluated the therapeutic regimen compliance amongst hypertensive middle-aged adults in Santiago City, Isabela, Philippines. Using a cross-sectional research design, data were collected from two hundred eighty-five hypertensive individuals aged 45-60 years. A survey instrument, the Hill-Bone Compliance to High Blood Pressure Therapy Scale was used to gather the data of the respondents. The findings of the study discovered that about 92.6% of the respondents unveiled very high compliance with their prescribed treatments for hypertension, while only 7.4% showed high compliance, with none demonstrating low or very low compliance. The statistical investigation has shown that there is no significant association between therapeutic regimen compliance and its demographic features such as age, sex, civil status, or educational accomplishment. Also, the study concluded that compliance in their therapeutic regimen in this population is exceptionally high, and unaffected by demographic factors, and recommends reinforcing current healthcare practices to uphold these outcomes.

KEYWORDS: Hypertension (HTN), Middle-aged adults, Therapeutic Regimen Compliance

I. INTRODUCTION

One of the leading avoidable causes of mortality worldwide is hypertension (HTN). Patients who are having hypertension are continually growing in numbers in less developed and developing nations [1]. Hypertension, well-defined as blood pressure ≥140 systolic or ≥90 diastolic or anti-hypertensive therapy, is expected to increase from 918 million individuals in 2000 to 1.56 billion by 2025. Assuming clinically correct Blood Pressure (BP) levels, two primary aspects contribute to hypertension management in treated patients: the prescription of an acceptable quantity and dose of prescribed BP medications, and compliance to treatment regimen and therapy [2]. Despite the recognised efficacy of antihypertensive drugs in controlling blood pressure, patient compliance in clinical practice is reported to be as low as 20 to 50 percent, and it implies that numerous patients have struggle adhering to long-term treatment recommendations [3]. In addition, any healthcare system that makes a significant contribution to global healthcare must prioritize the efficacy and efficiency of its healthcare workers to assist patients with hypertension. Using the full capacity of every healthcare practitioner can assist overcome a variety of health system difficulties and obstacles, accelerating progress towards Universal Health Care (UHC) [4].

It is believed that almost half of all hypertension patients do not take their antihypertensive medication as prescribed. As a result, treating physicians continue to face significant challenges in improving compliance to recommended treatment regimens in this group [5]. Suboptimal compliance, which includes failing to commence pharmacotherapy, taking drugs as recommended, and staying on treatment for an extended period of time, is a well-known contributor to poor blood pressure management in hypertension. Noncompliance is linked to a variety of factors, including demographics, socioeconomic status, concurrent medical-behavioral problems, therapy-related, healthcare team and system-related, and patient characteristics. Understanding the types of variables that contribute to noncompliance is helpful in addressing noncompliance [2].

Approaches to improve hypertension knowledge, treatment, or control rates are in great demand, and it has been proposed that one of the most successful strategies is to detect and treat hypertensive patients as soon as feasible. Similarly,

hypertension is a common condition that incurs significant medical costs. If individuals suffering from hypertension are not appropriately treated with medicine, issues will occur, resulting in actual financial costs. Patients with hypertension can reduce their blood pressure with medical therapy and lifestyle changes. Continuous pharmaceutical therapy for hypertension reduces hospitalization rates and the risk of complications like myocardial infarction and stroke. Antihypertensive drug treatment is the most effective technique for managing blood pressure over time. As a result, patient compliance is critical to the effectiveness of HT therapy [6]. This study sought to assess treatment compliance among hypertensive middle-aged people in Santiago City, Isabela, Philippines, as an important determinant in blood pressure management.

II. LITERATURE

Hypertension

Hypertension (HTN) is a disease considered by persistently elevated blood vessel pressure. Hypertension is a silent killer since it frequently produces no symptoms. People frequently say that hypertension is an incurable condition. They must regulate hypertension to avoid life-threatening consequences. Hypertension is a major public health issue across the world because it increases the risk of vascular disease, early mortality, stroke, renal disease, and retinopathy. It is the most important risk factor for cardiovascular disease, which kills around 12 million people globally each year, more than any other illness [7].

The term hypertension (HTN) or high blood pressure refers to excessively high arterial blood pressure. The Joint National Committee (JNC7) defines normal blood pressure as systolic BP < 120 mmHg and diastolic BP < 80 mmHg. Hypertension is defined as a systolic blood pressure of ≥140 mmHg and/or a diastolic blood pressure of ≥90 mmHg. The range of 120-139 mmHg systolic and 80-89 mmHg diastolic blood pressure (BP) is considered "prehypertension". Prehypertension is not a medical issue in and of itself, but it rises the likelihood of developing hypertension [8].

Moreover, according to Kurjogi, Vanti, and Kaulgud's (2021) study comprised 9,754 individuals, of whom 4,333 were male and 5,421 were female were classified into five (5) age groups. In the current study, 3,351 of the 9,754 individuals were healthy, whereas 6,403 were determined to have hypertension. In addition, 72.24% of 6,403 individuals self-reported their hypertension conditions, whereas 27.75% were ignorant of their elevated blood pressure and were identified only after an examination during the research period. Additionally, the prevalence of hypertension was somewhat greater in the male population. Hypertension prevalence varied by age category, with 41-60 years having the highest prevalence and ≤20 years having the lowest. The study also indicated a significant incidence of hypertension among alcohol-consuming subjects. Similarly, a significant incidence of hypertension was seen in the tobacco smoking/chewing group. It was also shown that the prevalence of hypertension was greater among those who had sedentary lifestyles [9].

A comprehensive study by Gutierrez and Sakulbumrungsil (2021) discovered that hypertension is the most important modifiable risk factor for stroke and myocardial infarction in both developed and developing nations. A prospective, multi-staged, stratified countrywide survey on hypertension was undertaken in the Philippines, and the prevalence of hypertension was determined to be 28%, or nearly 29 million persons, with a rise expected over time [3]. According to Musini, Tejani, Bassett, and Wright (2019), treating healthy persons with moderate to severe systolic and/or diastolic hypertension with antihypertensive drug, reduces all-cause mortality and cardiovascular morbidity and mortality [10].

In the research of Liu et al. (2020), 77.2% of middle-aged hypertension patients reported medication compliance and 40.7% reported blood pressure monitoring compliance (measured at least 12 times per year). Patients who were older, overweight or obese, had one or more problems, got health education, did not drink, and resided in cities had higher medication compliance rates. Better blood pressure monitoring compliance was related with older age, overweight or obesity, ≥3 problems, normal ADL ability, no smoking, enough sleep duration, better cognitive function, residing in urban areas, higher education level, and receiving health education [11]. Drug compliance is critical in the treatment of chronic illnesses at all ages. However, contrary to popular assumption, medication compliance is higher in patients aged 65-80 years than in young individuals [12].

Compliance to Therapeutic Regimen

Preceding to the World Health Organization (WHO) publishing the primary official definition of compliance in 2003, there were several definitions of compliance in the literature. Unlike earlier ones, it enclosed all elements of illness treatment, including nutrition and lifestyle adjustments, rather than only pharmacological treatment. Consequently, compliance was defined as the degree to which a person's behavior taking medication or treatment, following a diet, and making lifestyle changes that corresponds with agreed upon suggestions from a healthcare professionals. According to the WHO, when a patient refuse, it is the leading cause of uncontrolled blood pressure, with 50-70% of the population failing to take their antihypertensive medicine as prescribed. Identifying factors that influence drug compliance is the first step toward increasing it [13]. Furthermore, good

compliance is defined objectively as a medicine possession ratio of 80-100%. Historically, good compliance with hypertensive drugs has been connected to improved blood pressure control [3].

Numerous research has been assumed to look at the influences that impact medication compliance in hypertensive patients handled in the community. Using a multivariate logistic regression model, it was examine the factors influencing the medication compliance of hypertensive patients residing in a rural Vietnamese community. Most research employed a regression model to examine the multidimensional variables that influence patients' compliance with antihypertensive medicines. Although these factors may be connected, it was impossible to provide a strategy for improving medication compliance metrics based on a single element. However, a regression model was unable to overcome the collinearity in complex components [14].

According to Roka and Ghimire's (2019) study, 72% of patients showed limited compliance with antihypertensive treatment, with sub-group differences significantly larger among females (77%), those with co-morbidity (80%), and those receiving medications for free (76%). After multivariate logistic regression, it was discovered that patients with co-morbidity had higher odds of having low compliance than those without; and those who received medicine for free had higher odds of having low compliance than those who paid for medicine [15].

According to the report of WHO 2003, entitled "Compliance to Long-Term Therapies: Evidence for Action," the patients' ability to follow treatments is often hindered by multiple barriers. Interventions to encourage compliance should target these barriers that involves a systematic evaluation of all possible barriers. In the fight against hypertension, limited compliance to prescribed therapy is a key impediment to obtaining the desired blood pressure control. Individuals with low medication compliance are at a considerable risk of uncontrolled blood pressure and other harmful effects. It has been demonstrated that patients' engagement in decision-making, as well as their seriousness about disease and treatment, have a favorable impact on drug compliance [16].

III. METHODOLOGY

Research Design. Utilization of descriptive cross-sectional design to describe and measure potential related factors at a specific point in time for a defined population.

Site and Participants. The study was done in Santiago City, Isabela, and the respondents were 285 middle-aged people (aged 45-60 years old) who lived in the area and had high blood pressure.

Research Instrument. The Hill-Bone Compliance to High Blood Pressure Therapy Scale was used. Internal consistency reliability and predictive validity of the scale were evaluated using two community-based samples of hypertensive adults enrolled in clinical trials of high blood pressure care and control. The standardized coefficient alpha for the total scale was 0.74 and 0.84 [28].

Data Analysis. Descriptive statistics such as frequencies and percentages were used in the evaluation of therapeutic compliance among hypertensive middle-aged adults and the Chi-square test of independence to check for the relationship of the variables. The verbal interpretation in each category was based on the four-point Likert rating scale:

Scale	Value	Verbal Interpretation
4	56 and above	Very Low Compliance
3	42-55	Low Compliance
2	28-41	High Compliance
1	14-27	Very High Compliance

III. RESULTS

A. Demographic Profile Variables

As a gleaned table 1 shown the demographic characteristics of 285 participants. The majority of the respondents (50.5%) were from 45-50 age, and followed by 34.4% for aged 51-55, and the smallest group of the respondents (15.1%) being aged 56-60. Moreover, 70.5% of the respondents were married while the widow and single have 26.0% and 3.5% respectively, which indicates married population predominate in the study. Concerning sex, more than half of the respondents (57.5%) are female, while 42.5% are male.

Table 1. Demographic characteristics of Middle-aged Adults (N = 285)

Age	f	%
45-50 years old	144	50.5
51-55 years old	98	34.4
56-60 years old	43	15.1
Civil Status	**f**	**%**
Single	10	3.5
Married	201	70.5
Widowed	74	26.0
Sex	**f**	**%**
Male	121	42.5
Female	164	57.5
Highest Educational Attainment	**f**	**%**
Elementary	78	27.4
High School	139	48.7
College	68	23.9

As for the highest educational attainment, nearly half (48.7%) have completed high school, while 27.4% have only attained elementary education, and 23.9% have finished college degree.

B. Descriptive summary of the therapeutic compliance among hypertensive middle-aged adults in Santiago City, Isabela

Table 2. Therapeutic Compliance among Hypertensive Middle-aged Adults

Category	F	%
Very Low Compliance	-	-
Low Compliance	-	-
High Compliance	21	7.4
Very High Compliance	264	92.6

The above table shows the compliance on the therapeutic regimen of the hypertensive middle-aged adults of Santiago City. The study found out that there are 92.6 percent of the respondents who excellently comply on taking their hypertensive medications. Hence, there is a count of small portion of the respondents that exhibits “high compliance” suggesting that they adhere well in their treatment but albeit slightly less strictly compared to “very high compliant” group of the respondents as to 7.4 percent or 21 respondents.

Table 3. Chi-Square Test of Independence on the relationship between therapeutic compliance among hypertensive middle-aged adults according to their demographic variables

	Demographic Variables	**X^2**	**df**	**p-value**
Therapeutic Compliance	Sex	9.570	10	0.683
	Age	47.550	40	0.442
	Civil Status	16.388	20	0.690
	Highest Education Attainment	32.570	20	0.059

To determine whether there is or no existing significant relationship on therapeutic compliance among hypertensive middle-aged adults when grouped according to their demographic variables, a chi-square test of independence was conducted. The test result revealed that respondents did not significantly differ in therapeutic compliance in terms of Sex (x2 = 9.570, p = 0.683), age, (x^2(40) = 47.550, p=0.442), civil status (x^2 = 16.388, p = 0.690) and highest educational attainment (x^2 = 32.570, p = 0.059). It implies that hypertensive middle-aged adults have the same therapeutic compliance based on their demographic profile.

IV. DISCUSSION

According to the WHO, there are many factors leading to poor treatment compliance that can be classified into five categories: socio-economic factors, treatment-related factors, patient factors and / or those around them, factors associated to the disease and factors related to the health care system [17]. The results in this study which reflect high therapeutic regimen compliance

among hypertensive middle-aged adults, that validate a remarkably high rate of compliance, with about 92.6% showing "Very High Compliance" and 7.4 percent that categorized under "High Compliance." This result is higher than what has been reported in many other research studies.

In the year 2021, the study by Pinho et al., the compliance rate to hypertension therapy was reported to be suggestively lower, with only 34% of patients that demonstrating good compliance. Similarly, a study showed in Mali found that only about 28.6% of hypertensive respondents displayed good compliance, with 19.6% demonstrating poor compliance. These figures are far below the compliance levels seen in the present study, highlighting a stark difference that may be ascribed to variations in healthcare organization, access to medication, and/or patient education [18]. In the impact of Healthcare Systems in compliance with therapeutic regimens in more developing countries, the compliance rates are considered generally higher, but can say that still not as elevated as in the present study. For example, the study from the well-known countries like United States (U.S) and European, between year 2019 and 2021, it has been reported that approximately 60-70 percent of hypertensive patients adhered well in taking their medication or treatment to hypertension. This gap may reflect differences in patient education programs, healthcare delivery systems, and patient monitoring. In distinction, the present sample may benefit from stronger community-based healthcare support or interventions that confirm better supplement.

Moreover, recent involvements using digital health tools have been shown to a significantly improve compliance. A 2022 study, they highlighted the usage of gadgets like mobile phones or smartphones apps and digital that can remind to boost medication compliance, especially for those patients who experience chronic conditions like hypertension [19]. In this context, the remarkably high compliance rates observed in this study that might reflect the integration of similar technologies or strategies within the healthcare system. These digital tools, combined with frequent follow-up, are increasingly recognized as a crucial factor that can contribute in maintaining high compliance rates.

Furthermore, another probable explanation for the high compliance observed in this study could be related to patient education. There are research from year 2018-2022 emphasizes that effective health education on the risks of uncontrolled hypertension and the importance of treatment compliance is essential for improving compliance. In countries where comprehensive patient education programs are implemented, compliance rates tend to be higher. This may be the case in the current study, where educational interventions might have played a role in achieving high compliance [20, 21].

Additionally, socioeconomic status is a well-documented factor influencing therapeutic compliance. Studies conducted between 2019 and 2023 have shown that patients with higher income levels, insurance coverage, and access to affordable medications are more likely to adhere to their prescribed treatments [22]. The absence of "Very Low" or "Low" compliance in the current study could suggest that the participants had access to sufficient healthcare resources and financial support, contributing to their high compliance rates. Subsequently, to systemic and economic factors, social support systems have been shown to positively influence therapeutic compliance. A study in year 2020 it found that with strong family support were more likely to comply or adhere in a long term treatment. Whereas the current study population may benefit from such support structures, which might help explain the extraordinary levels of compliance observed.

Lastly, a 2021 study pointed out that complex medication regimens and medication side effects often lead to poor compliance among hypertensive patients [25, 26,]. In contrast, the participants in the present research study may have been prescribed simpler medication regimens or benefited from more regular communication with healthcare providers, reducing the likelihood of side effects or confusion about dosing. This could be another reason for thevery high compliance rates [27].

CONCLUSION

The study therefore concludes that there is an overwhelming majority rates of the respondents which categorized to a very high compliance (92.6%) and 7.4% under high compliance rates. Also, none of the respondents fell into the low or very low compliance categories. Additionally, in checking the relationship of the variables, statistical analysis using the chi-square test of independence was used and it indicated that there is no significant relationship between therapeutic regimen compliance and demographic variables such as sex, age, civil status, or educational attainment. This proposes that compliance levels were consistent across different demographic group.

RECOMMENDATION

The finding of the study gives insights to improve and maintain the therapeutic regimen compliance of hypertensive patients. The study suggests that healthcare professionals, like doctors and nurses, continue encouraging a high level of treatment adherence

and observe patients with hypertension by emphasizing regular monitoring of their health not only their blood pressure but also patient education about their health and correct usage of their treatment procedures.

Moreover, the study's result revealed no significant difference in the treatment regimen as to their demographic factors it is advisable to give intervention not only to specific target populations but must be uniformly implemented across different age, sex, marital status and educational attainment.

Lastly, future researchers they should explore other potential factors that may influence and contribute to treatment adherence to hypertension, such as psychological, socioeconomic, or lifestyle factors, to gain a deeper understanding of the factors that drive treatment adherence. This could help in developing more personalized treatments for individuals at risk of low adherence.

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