

Nutrition Status and Selected Factors Associated with Malnutrition of Children between 2-5 Years of Age in Medical Officer of Health Area Attanagalla, Sri Lanka



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ABSTRACT: Gampaha district is the second most populous district of Sri Lanka and prevalence of stunting, wasting and underweight among 2 to 5 years old children has been on average, at a level higher than 10%. This study aims to describe the nutrition status and selected factors associated with malnutrition of children of 2 to 5 years of age, in the Medical Officer of Health Attanagalla area in Sri Lanka.

A community based cross sectional study was carried out in all fifty Public Health Midwife areas in Attanagalla, Gampaha district from January to March 2014 among 455 children, within the age category of 2 to 5 years. Interviewer administered, pre tested and structured questionnaire was used by five trained data collectors, to obtain data from the mothers or female guardians of the children.

Results show that among the children prevalence of stunting (16.3%), wasting (9.5%) and underweight (18.7%) were identified based on anthropometric measurements. All three nutritional indices were high among male children ($P > 0.05$) and children within the age categories of 36-47 months and 48-59 months were more susceptible ($Df=2$, $P > 0.05$). Higher level of education ($Df=1$, $P < 0.01$), both parents being employed and high income had a positive impact on the reduction of the three indices. Breast feeding only during the first six months and adopting complimentary feeding during the first six months since birth, had a significant ($P < 0.05$) impact. Lack of knowledge on proper feeding practices during a child's illness and unsafe drinking water ($P < 0.01$), were other key concerns.

Implementing community empowering and educational programmes are recommended in reducing malnutrition in the Medical Officer of Health Attanagalla area in Sri Lanka.

KEYWORDS: children, malnutrition, stunting, underweight, wasting

I. INTRODUCTION

Malnutrition persists as one of the most serious health problems in the world (Cattaneo, et al. 2008) and recognised as the main contributory factor to child mortality. Risks of malnutrition (World Health Organization, 2009) are known to be extremely high during the foetal development stages in the uterus and also during the first two years of life. Any damage caused during this period is irreversible and the impact will be felt throughout the lifecycle.

Since gaining independence in 1948, Sri Lanka has achieved remarkable improvement in educational, health and social sectors. Nevertheless, the nutritional levels of children have not been satisfactory and prevalence of underweight, stunting, wasting and overweight has been prominent during the last few decades (Jayatissa, 2009). Statistics have revealed that, the levels of three key nutritional indices have shown a gradual decline in the recent past and when compared with 2012, the levels in 2013 (Family Health Bureau, 2013) were underweight (17%), stunting (11.2%) and wasting (13%).

Factors causing under nutrition differ and are identified as basic, underlying and immediate. Distribution of resources in a country play a key role in terms of being able to provide the basic facilities to build a nation with healthy people. Political, social and economic aspects of a country has a significant impact on the poverty levels, education, household income, food security and quality of health services of its population. Accordingly, there are certain salient factors which, have been identified as the major root causes for malnutrition.

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Based on demographics and geographical presence, Gampaha is the second most populace district in Sri Lanka with a population of 2.4 million, at an annual growth rate of 1.7% (Medical Statistics Unit, 2018), in a land area of 1,341 sq.km. The Medical Officer Area (MOH) of Attanagalla is identified as a significant representation of the Gampaha district population which, consists of different ethnicities. This study assesses the factors impacting the nutritional status of the children between the age group of 2 to 5 years, residing in the MOH area of Attanagalla.

II. METHODOLOGY

A community based descriptive cross sectional study was carried out within the boundary area of MOH Attanagalla which, is one of the sixteen MOH divisions in the Gampaha district. Mid-year population of the area recorded in 2013 was 192,995 amongst which, 8282 children consisted of 2 to 5 years age group. A staff strength of fifty Public Health Midwives (PHMs) and seven Public Health Inspectors (PHIs) are assisting the MOH Attanagalla to serve a demographically, socially, economically and culturally diverse urban and rural populace. Based on the above facts the study population was identified of children between the age categories of 2 to 5 years. who have been living in Attanagalla, MOH area since birth. A sample size of 455 children were considered for this study which, was carried out during the period of 4th August to 31st December 2014. A division within the PHM area was identified as a cluster and nine children within the specified age category were selected from all fifty PHM areas. The remaining five children were chosen from PHM areas where the population was five thousand or more persons. Furthermore, in households where there was more than one eligible child, the younger child was selected and in the event if there were no residents at the house visited or the eligible child was not available, the particular residence was visited again.

Structured, interviewer administered and pre tested questionnaire was used to collect data from the mothers or female guardians of the children. Questionnaire was structured in a manner which, captured the feedback related to broad categories such as identification, demographic and socio economic, feeding and other dietary practices, environmental factors and general health of the child and health services. Five (n=5) trained, data collectors administered the questionnaire by visiting each household, of the identified sample population.

Pearson Chi square test, (or Fisher exact test) was used to identify the factors associated with malnutrition and SPSS statistical software as well as Anthro (WHO Anthro version 3.2.2) (Garenne, et al. 2012) were used to calculate the nutrition z-scores of the children.

III. RESULTS

The majority of the respondents who provided the required feedback were mothers (n=420, 92.3%) and the age group of the study population were mostly (n=192, 42.2%) between 24 to 35 months. The socioeconomic characteristics showed that, in terms of education levels the majority of the mothers (n=259, 56.9%) and fathers (n=246, 54.1%) have studied up to G.C.E. Ordinary Level and both parents had a very high level (99.6%) of literacy as well. In terms of parenting aspects, 81.3% (n=370) were housewives while 18.7% were employed and their children were being looked after by the grandmothers (88.9%). However, the fathers too played a critical role in the upbringing of the children. Most of the fathers were employed as professional/ technicians (n=128, 28.3%), with the greater population (n=242, 53.2%) having a monthly household income within the range of Rs.20,000/= to Rs. 32,000/=. The residential environment remained quite modest, with majority of the houses (n=390) having basic facilities and constructed in a standard manner.

The prevalence of stunting (16.3%), wasting (9.5%), underweight (18.7%) and overweight (0.9%) among the children in Attanagala MOH area were identified, based on applicable procedures of using standard equipment and anthropometric measurements ((Garenne, et al. 2012). Analysing the variations of the key nutritional indices with the main demographic characteristics selected for this study, indicated the following results as shown in Table 1.

Overall analysis did reveal that, children between the age categories of 48-59 months were stunted (Df=2, P>0.05) and were affected by wasting ($X^2=0.042$, Df=2) while underweight was prominent among children of 36 to 47 months ($X^2=0.471$, Df=2, P>0.05) and overall more male children were prone to these health concerns.

Table 1: Analysis based on Key Demographic Characteristics

Demographic characteristic	Stunting	Wasting	Underweight
Age (months)			
24-35	14.2%	9.1%	17.3%
36-47	16%	9.6%	20%

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48-59	19.5%	9.8%	19.5%
Sex			
Male	19.3%	9.9%	19.7%
Female	13.1%	9%	17.6%
Ethnicity			
Sinhala	16.3%	9%	19.2%
Muslim	15.9%	13.6%	13.6%

In terms of socio economic aspects the nutritional indices of the children were analysed and the details are summarised in Table 2.

Table 2: Analysis based on Key Socio economic Characteristics

Socio economic characteristic	Stunting	Wasting	Underweight
Education (Up to G.C.E. O/ Level only)			
Mother	21.4%	10.3%	21.8%
Father	19%	11.7%	23.1%
Education (Up to G.C.E. A/ Level)			
Mother	8.7%	8.2%	14.1%
Father	11.5%	5.5%	10.9%
Occupation			
Father			
Semi-skilled	18.9%	13.2%	18.9%
Unskilled	-	-	-
Unemployed	18.2%	18.2%	27.3%
Mother			
Semi-skilled	9.1%	18.2%	18.2%
Unskilled	18.2%	18.2%	18.2%
Unemployed	17.8%	9.9%	9.9%
Income level (Rs.)			
Up to 19999	18.2%	19.5%	22.1%
20000-31999	18.9%	6.1%	19.3%
>32000	11.4%	9.4%	16.1%

Education level of both parents has played a decisive role in child care, as a noteworthy reduction was witnessed in stunting (Df=1, P<0.01) and underweight (mother: P<0.05 and father: P<0.01) where, the parents have studied up to G.C.E. A/Level. Wasting was less (P<0.05) among children whose fathers had studied beyond G.C.E.O/Level but an increased (n=28, 10.3%, P>0.05)

prevalence was seen among the children of the mothers who had studied only up to G.C.E O/Level. Father's unemployment (27.3%) status had impacted significant underweight concerns of the children and with regard to stunting both parents (father: 18.2%, mother: 17.8%) being unemployed, has had a considerable effect as well. It was obvious that, the children (Df=2, stunting=18.2%, wasting=19.5%, underweight=22.1%) of families earning less Rs. 20,000/= monthly income were suffering from nutritional deficiencies.

Further analysis was done to assess the impact based on breast feeding practices, feeding methods adopted by mothers during illnesses suffered by children and also on hygiene levels of drinking water. As shown in Table 3, the results indicated varied impact on the growth of the children.

Table 3: Analysis based on Identified Feeding Practices and Drinking Water Hygiene

Factor Description	Stunting	Wasting	Underweight
Breast feeding			
<6 months	25.4%	15.3%	28.8%

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6 months completed	14.8%	8.3%	16.9%
Complementary practices			
<6 months	25%	15.3%	28.3%
6 months completed	15.1%	8.3%	17.2%
Feeding practices during episodes of illness			
Less food than usual	22.2%	14.8%	29.6%
Liquid diet only	17.9%	12.8%	23.1%
More food than usual	12.1%	6.1%	10.6%
Food as usual	14.8%	7.4%	15.7%
Drinking water source			
Own well	14.5%	9.7%	18.5%
Public supply	12.8%	5.1%	12.8%
Tube well	37.5%	25.0%	37.5%
Other	58.8%	17.6%	41.2%
Methods of purifying water			
None	16.1%	16.1%	21.0%
Boiling	16.7%	8.0%	18.4%
Filtering	14.6%	7.3%	19.5%
Other	-	50.0%	-

Common observation was that, the children who were being breast fed only for a period of less than six months showed significant signs of stunting ($Df=1$, $P<0.05$), wasting ($X^2=2.917$, $Df=1$, $P>0.05$) and underweight ($X^2=4.790$, $Df=1$, $P<0.05$). Similar results were seen among the group of children who were less than six months of age, whose mothers adopted complimentary feeding methods. During episodes of sicknesses, the feeding methods adopted by parents or guardians have had an impact on the child's nutritional indices. Being offered less food than the usual quantity and liquid diet had led to an increase in stunting ($Df=3$, $P>0.05$), wasting and underweight ($Df=3$, $P<0.01$). In terms of hygiene and the sterility of consumed water, children who were exposed to tube wells and other sources of water as well as not adopting water purification methods, were very much susceptible for deficiencies related to their growth.

IV. DISCUSSION

The sample population selected for this study, residing in the Attanagalla MOH area, was a representation of varied ethnicities, religions, cultural practices, education and income levels which, in turn seemed to have impacted the nutritional status among the children, in different ways.

Though a direct comparison was not possible to gauge the variances in the nutritional indices of the children in this area, when compared with the DHS survey done in 2006/2007 (Jayatissa, 2009) for children of under 5 years, a significant reduction in wasting (2006/2007 years: 14.7% and 2014 year: 9.5%) was seen in this study. Nevertheless, the declining trend on stunting and underweight was minimal ($\leq 2\%$). The National Nutrition and Micronutrient survey conducted in 2012 revealed contrasting results but was based on the entire Gampaha district. According to this survey, prevalence of stunting (9.4%) was less while wasting (18.5%) and underweight (21.7%) was high. Considering a more relevant comparison, the Annual Nutrition month data in Gampaha district in 2013 revealed that, stunting (7.9%), wasting (9.8%) and underweight (13.5%) among the children between 2 to 5 years had reduced or indicated an improvement.

Outcome of this study showed that, all three nutritional indices were more prevalent among male children ($P>0.05$) and children within the age categories of 36-47 months and 48-59 months were more vulnerable ($Df=2$, $P>0.05$). This fact was evident in a study ($n=3542$) done in Malaysia as well within the age category of 6 to 12 years of children. Furthermore, higher level of education ($Df=1$, $P<0.01$), both parents being employed and high level of monthly income had a positive impact, as all three indices showed an improvement. Children of mothers who adopted breast feeding only for a time period of six months and also who adopted alternative feeding practices during the first six months, were significantly ($p<0.05$) exposed to low nutrition. Lack of knowledge regarding proper feeding practices during child's illness and unsafe drinking water ($P<0.01$), were other key concerns which, affected the prevalence of malnourishment among the selected group of children, in the Attanagalla, MOH area.

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V. CONCLUSIONS

It should be mentioned that, the varied demographics, socioeconomic and environment factors, hygiene standards of consumed water, episodes of illnesses, together with the feeding practices adopted by mothers have impacted the nutritional standards of the children identified for this study. Further as explained, the deep rooted cultural beliefs of the two prominent communities (i.e. Sinhalese and Muslims) in the Attanagala area, would have somewhat impacted the life style and decision making process, of the parents of these children. In such an environment specific and relevant intervention strategies, need to be considered to overcome concerns related to malnutrition.

Furthermore, though the educational levels of both parents were at satisfactory levels it was evident that, the mothers lacked knowledge on key aspects related to nutrition especially feeding practices and hygiene. The active involvement of PHMs in creating awareness, conducting relevant training and educational programmes would help the mothers and caregivers, to gain a proper understanding of adopting proper nutritive diets and improving standards of cleanliness to overcome undernourishment. In order to eradicate malnutrition it is important to enforce regular monitoring and evaluation systems, which will help to gauge the effectiveness of the plans and programmes implemented in the specific areas. This could be carried out with the involvement of the Regional Director of Health Services (RDHS) and MOH while, it should not be limited to a particular area or region of the country. If Sri Lanka is to achieve the specific Millennium Development Goals (MDGs) (Senanayake, 2011) as specified by WHO, it is imperative for the government health officials to implement stringent evaluation systems across the country, to monitor the variances in the key nutritional indices of children

ACKNOWLEDGMENT

The authors acknowledge the support given by the officials at the Provincial Directorate of Health Services, Western Province, Regional Director of Health Services Gampaha District and the staff at Medical Office of Health in Attanagalla, Sri Lanka.

COMPETING INTERESTS

The authors declare no competing interests.

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