

Nutritional Status of Grade Five Students in Selected School of Batticaloa District, Sri Lanka

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Abstract

Objective: To describe the nutritional status and the factors influencing nutritional status of grade five school children in Manmuni North educational division Batticaloa District, Sri Lanka.

Methods: A descriptive cross-sectional study was carried out among grade five school children in Manmuni North educational division, Batticaloa. Six schools were selected for this study was receiving nutritional supplements. Body Mass Index (BMI) was calculated for each child. The age and sex specific BMI charts developed by the National Center for Health statistics 2000 were used as standards. Data were statistically analyzed using the STATA 8.2 software.

Results: The prevalence of underweight (< 5th percentile) was 44.4% and the prevalence of overweight (≥ 85th percentile) was 10.5%. The relationship of malnutrition with sex, family type, number of siblings, mother's occupation, monthly income, worm treatment, food allergy and dental caries were considered for analysis of the studied factors. Sex, number of siblings and worm treatment were statistically significant with malnutrition.

Conclusion: Underweight (44.4%) is a problem among grade five children. About 11.0% of them were overweight. Most of the students (66.7%) did not get regular worm treatment; of them (48%) were from rural area. Dental caries were observed in (51%) of students. Students who were malnourished showed statistically significant associations with gender, number of sibling in the families and not taking of regular worm treatment. It is evident that a substantial population does not consume a varied and balanced diet, even though Sri Lankan Dietary Guideline has emphasized the importance of it.

Keywords: Nutritional status; Influencing factors; Malnutrition; Batticaloa

Introduction

The nutritional status of a population determines the overall health status which affects the growth and development of a society [1]. Malnutrition is the most pressing problem of the world, damaging both children and the nations [2]. A significant proportion of deaths of young children worldwide are due to malnutrition and it should be a policy priority with efforts to reduce malnutrition [3]. Despite the economic growth observed in developing countries, malnutrition particularly under nutrition is still highly prevalent [4]. The underlying causes of malnutrition vary with poverty, low levels of education and poor access to health services [5].

School children are dramatically affected by anemia [6], Vitamin A deficiency [7] and parasitic infections [8] with adverse impact on their nutritional status [9] as well as on their cognitive development and school performance [10]. School age is a period of rapid growth in human development when nutritional demand is increased and dietary habit is established. Also, emotional development is seen, such as self-consciousness and one's values are established in addition to physical development [11].

A Study reported that the growth rate is slightly slowed down, but dietary habit is formed and fixed during the school age, which is thus greatly affected by stimuli through school life and peer groups [12]. Nutrition of school age children has not only direct and short-term influence on physical and mental growth, but also indirect and long-term influence on continuing growth. The importance of nutrition in school age children has been emphasized because malnutrition during this period can decrease not only physical and mental development, but also the learning ability of children [13].

As the frequency of eating with the family is decreased and the

number of children eating alone or preparing a meal by themselves, is increased due to socioeconomic changes, it has been reported that the quality of the meal is lower when children eat alone than when eating with the family. The rate of skipping meals is increased in children eating alone, and the establishment of proper dietary habit is interfered by eating alone [14].

School age children do not have sufficient general knowledge of their own health and nutrition and are not aware of the importance of health, and thus select foods on the basis of preference without proper judgment to aggravate unbalanced diets [15].

There was no detailed study or analysis conducted in the Batticaloa District, regarding the factors influencing nutritional status up to date. Therefore, this study was undertaken as a preliminary study to describe the factors influencing on nutritional status of grade five students at selected schools in Manmuni North educational zone of Batticaloa District, Sri Lanka [16].

Methodology

It is a Cross Sectional Descriptive study, which was carried out

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in selected schools, having a nutritional supplement programme in Manmunai North Educational division, Batticaloa district. Two schools were selected from each urban area, rural area and the third middle area for this study [17-20]. Study population consisted of the all the students studying in grade five in the selected schools during the year of 2012. The student(s) who were absent or did not support the study on the day of visit were excluded. The study period of the research was one year duration. A structured interviewer administered questionnaire (IAQ) was used to collect information and anthropometric measurements such as weight and height also were measured.

Data collection

Data collection was done by the researcher and his trained team took the reading of anthropometric measurements and assisted in filling the questionnaires. The participants were sensitized thoroughly about the purpose of the study. All anthropometric measurements were performed by standard procedures; weight was measured with an accuracy of $\pm 100g$ using bathroom scale. Height was measured in a standing position, without shoes, to the nearest 0.1 cm using a height measuring board and BMI was computed as $\text{Weight (Kg)} / \text{Height}^2 (\text{m}^2)$.

The interviewer administered questionnaire (IAQ) was prepared in English language and translated into Tamil language and then translated back to English language for consistency [20-25].

Data analysis

Analysis was done using STATA 8.2 software. The nutritional status was assessed using the age and sex specific body mass index (BMI) calculated using the height and the weights of the children [26].

In order to assess the effect of factors which determine the nutritional status of the grade five children in Manmunai North Educational division, the multiple linear regression was applied since the distribution of the data appeared as an approximately normal distribution. The *p* value calculated in 95% confident interval. The National Center for Health 2000 [27] reference value was used for categorization. BMI-for-age weight status categories and the corresponding percentiles are shown below (Table 1).

Ethical consideration

Ethical clearance for the study was obtained from the Ethical Review Committee of Faculty of Health-Care Sciences, Eastern University, Sri Lanka. Permission for data collection was obtained from Zonal Director Batticaloa and the Principals of the relevant schools in Batticaloa district.

Results

Description of the study sample

The study consisted of 153 school children of which males were 82 (53.6%), females were 71 (46.4%). Hindus accounted for 107 (69.9%) and the rest of them were Christians 46 (30.1%). Most of the students' parents had monthly income less than nine thousand rupees 101 (66%). Most of them were living as a nuclear family 106 (69.3%) while others were in joint family 47 (30.7%).

The prevalence of underweight was 68 (44.4%), while the prevalence of normal weight, overweight and obesity was respectively 73 (46%), 12 (7.8%) and 4 (2.6%) among grade 5 students (Figure 1).

58% of middle area students were in the underweight while and 11 (22%) of the urban area children were in the overweight category. Overweight and obesity were highly prevalent in urban area school children. Overweight and obesity category was not present in rural area (Figure 2).

Female children had a higher prevalence of underweight 36 (50.7%) than boys. In the other hand boys had a higher prevalence of overweight 11 (13.4%) than girls. Normal weight students were equal percent in male and female. The children suffering from underweight in nuclear and joint family were 48 (45.7%) percent and 20 (41.6%) percent respectively. The majority of mothers (74.0%) of underweight students had jobs. Further, students who are from the family income less than Rs.9, 000.00 had the highest prevalence 48 (47.5%) of underweight. The highest prevalence of overweight of students was observed in monthly income between Rs.14, 000.00 to Rs.19, 000.00 (Table 2).

The total number of siblings in the family and their nutritional status was assessed by using BMI classification. The students who had no siblings, 5 students (45.5%) represent in underweight category, 4 students (36.36%) in normal weight and 2 (18.18%) were in the overweight category (Table 3).

About half (49%) of underweight students were not treated regularly with worm treatment. Higher percent of students had dental caries among underweight students (53%) than normal weight students (52%) and overweight students (8%). Also, the histories of allergy for some food were found higher among students with underweight (58%) than normal weight (49%).

Analysis

It was evident from the results, except for three variables, (gender, number of siblings in the family and worm treatment) all of other independent variables were not statistically significant factors with the nutritional status (BMI). But the gender, numbers of siblings in the family and worm treatment were statistically significant with the

Weight Status Category	Percentile Range
Underweight	Less than the 5th percentile
Healthy weight	5th percentile to less than the 85th percentile
Overweight	85th to less than the 95th percentile
Obese	Equal to or greater than the 95th percentile

Table 1: BMI-for-age weight status categories and the corresponding percentiles.

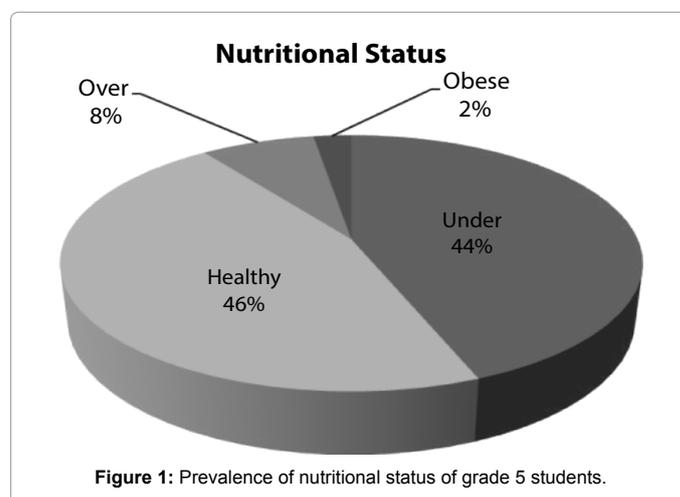


Figure 1: Prevalence of nutritional status of grade 5 students.

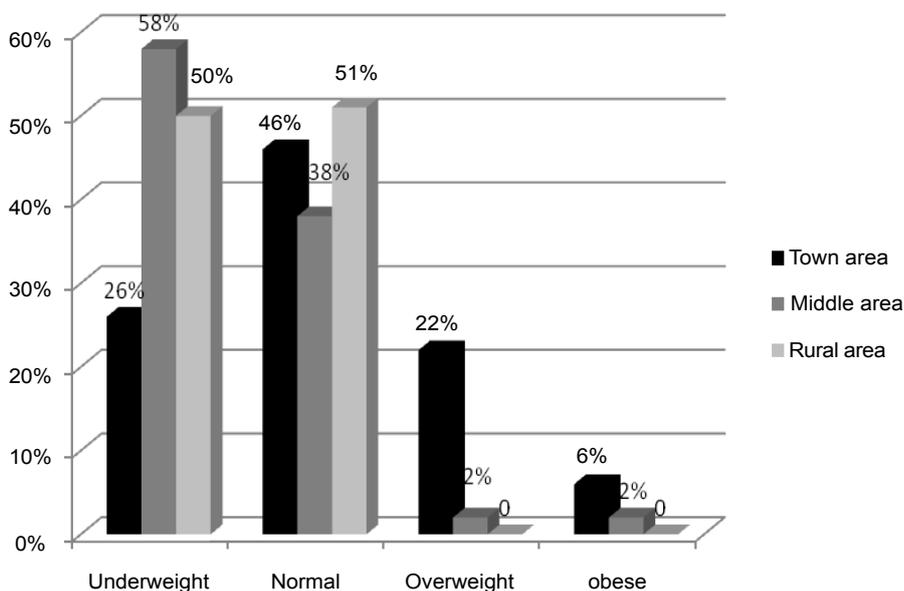


Figure 2: Prevalence of nutritional Status of students according to their living area.

Variable	Nutritional status							
	Underweight		Normal		Overweight		Obese	
	No	%	No	%	No	%	No	%
Sex								
Female	36	50.70	32	45.07	01	01.41	02	02.82
Male	32	39.02	37	45.12	11	13.41	02	02.44
Family type								
Joint family	20	41.67	22	45.83	04	08.33	02	04.17
Nuclear family	48	45.71	47	44.76	08	07.62	02	01.90
Mother's occupation								
Have job	23	74.19	06	19.35	00	00.00	02	06.45
House wife	45	38.14	60	50.85	11	09.32	02	01.69
Monthly family income								
<Rs.9,000.00	48	47.52	45	44.55	05	04.95	03	02.97
Rs.9,000.13,999	16	44.44	16	44.44	03	08.33	01	02.78
Rs.14,000-19,999	02	18.18	05	45.45	04	36.36	00	00.00
>Rs.20,000.00	02	40.00	03	60.00	00	00.00	00	00.00

Table 2: Nutritional status vs. Socio-demographic factors.

Number of Siblings	Underweight		Normal		Overweight		Obesity	
	No	%	No	%	No	%	No	%
0	05	45.45	04	36.36	02	18.18	00	00.00
1	13	28.89	25	55.56	05	11.11	02	04.44
2	22	57.89	12	31.58	02	05.26	02	05.26
3	17	44.74	20	52.63	01	02.63	00	00.00
4	07	50.00	05	35.71	02	14.29	00	00.00
>5	04	57.14	03	42.86	00	00.00	00	00.00

Table 3: Nutritional status vs. Total number of siblings in the family.

nutritional status (BMI). These significant impacts illustrated with the coefficient values as shown below (Table 4).

Thus, the coefficient of gender indicates there would be an increase of 2.28 in the BMI: this means that the male children have higher BMI than females.

The number of siblings in the family also tends to play an impact on nutritional status of the children. The number of sibling in the family seems to reduce BMI by 0.893 for each one unit increment. Thus, it can be concluded that children with lower number of siblings having a better status of health than the children with higher numbers of siblings.

Significant Variables	Coefficient Values	P - value
Gender	2.280	0.009
Number of siblings	-0.893	0.05
Worm treatment	2.278	0.034

*Significant level is 95% confidence interval

Table 4: Coefficient values and significance levels for significant variables.

Insignificant Variables	Coefficient Values	p -value
Family type	-0.630	0.533
Mother has job	-0.084	0.957
Housewife	0.237	0.853
Birth order	0.508	0.327
<Rs.9,000.00	1.182	0.268
Rs.9,000.00-13,999.00	3.063	0.073
> Rs.14,000.00	-2.031	0.495
Food allergy (if No)	1.351	0.147
Dental caries (if No)	1.278	0.132

*Significant level is 95% confidence interval

Table 5: Coefficient values and significance levels for insignificant variables.

Worm treatment also tends to have an impact on the nutritional status of the children. It's has a positive coefficient with the BMI. If the children are taking worm treatment regularly the BMI is 2.278 higher than the children not taking worm treatment (Table 4).

These factors don't have the significant relationship with the malnourish child's nutritional status.

We observe that if the family income increases up to a certain level only, the BMI has a positive relationship with the family income. If the family income increases more than the normal level (monthly income 2) then the relationship between monthly income and BMI has a negative relationship (Table 5).

Discussion

Parents are the main source of influence for growth and development of children, especially during infancy and childhood. The highest prevalence of underweight in the rural children and higher prevalence of overweight in the urban children was seen in the present study.

The present study revealed that in families with greater number of children, less attention was paid to the fulfillment of the nutritional requirement of the children. This finding was statistically significant. A similar association was seen in other studies done in Patna [16] and the children in urban slums of a city in Northern India [28]. Birth order was statistically not significantly affect the nutritional status among the children. No association was seen for underweight though the proportion increased with an increase in birth order. Birth order was statistically not significantly affect the nutritional status among the children. No association was seen for underweight though the proportion increased with an increase in birth order. But in Kuwait [29] and Vietnamese study [30] shows there is an association between birth order and the nutritional status.

A study carried out between 6 to 11 years children in Patna [16] arrived at a unique finding that there was not much of an effect of family type in determining the nutritional status of the children. Both studies show that no significant relationship exists between the nutritional status and the family type. Therefore, this is in contradiction to the general belief that children in joint families are less cared for or not

cared for with regard to their nutrition as compared to the children in the nuclear families. This fact may be attributed to the lack of awareness of nutrition among parents and guardians. In our study underweight was observed more in nuclear families. Similar findings were observed in a study done in Kenya [31].

The female children had comparatively lower nutritional status than male children [16]. Similar finding was observed in this study. Gender has a significant impact on the nutritional status in children. In Kalutara area, Study [26] also found that association with the sex and the nutritional status among school children was highly statistically significant. Few studies have documented gender difference with regards to malnutrition in young children particularly in sub-Saharan Africa [32,33]. From that we can tell that gender plays a significant role in children nutritional status.

In our current study shows there was no statistically significant association between mother's occupation and the nutritional status of the children. Results showed the same trend in Kuwait [29] and Vietnamese study [30] too.

In the present study, children of higher economic status were less underweight than children of lower economic class. Malnutrition showed mixed results within the different economic groups.

Although an association between economic class and nutritional status was not statistically significant, the trend was consistent with other studies [34,35].

Conclusions

68 (44.4%) of the students were in the underweight category, while overweight were 16 (10.5%). Most of the students do not get regular worm treatment. Dental caries were observed in 78 (51%) students.

The nutritional status of malnourished children showed statistically significant associations with gender, number of sibling in the families and taking worm treatment. It shows that a substantial population does not consume a varied and balanced diet, even though Sri Lankan dietary guidelines have emphasized the importance of a balanced and varied diet.

Recommendations

The nutritional supplement programme has much effect on the nutritional status of the children. So the nutritional supplement programme in the schools should be continued without any interruption. There is a need for school health programmes to monitor periodically children's eating habit and personal hygiene. As well as appropriate counseling on nutritional intake should be given not only to school children, but also to their teachers and parents or caregivers.

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