

Nutritional Status among Primary School Children in an Upozila of Bangladesh

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Abstract

Objective : The objective of this research is "to assess the nutritional status of primary school children of rural areas", in terms of the incidence of stunting and wasting among the children.

Methods : Descriptive, cross-sectional study was administered in two primary schools located in sreepur during May-June 2010. The schools were selected using purposive sampling technique. From these selected schools, a total number of 345 students studying from class IV to V were enrolled in the study. First anthropometric measurements such as Age (in years), Height (in Cms), and Weight (in Kgs) of each child were taken to assess their nutritional status.

Results : The mean height of children was (136.9; SD±8.57cm) not comparable with National Centre for Health and Statistics (NCHS), USA. Among 345 students, 81.74% of the students were found to be undernourished. Underweight, stunting, and wasting were present in 40.2%, 57.98%, and 23.77% of schoolchildren, respectively. Underweight was associated with lower household wealth ($p < .05$). The mean weight (27.18 Kg; SD ± 6.78kg) was lower than NCHS standards. Among underweight children girls (47.62%) were found to be higher than boys (32.77%). The students were more stunted (57.98%) than wasted (23.77%). Only 10.15 % of the students were found to be both wasted and stunted.

Conclusion : The study revealed that high percentage of primary school students was malnourished. The study result also revealed the urgent need for initiation of school health program with specific emphasis on, improvement of nutritional status personal hygiene and prevention of diseases with the collaboration of governmental and non-governmental institutions.

Key Words : school health, nutritional status, malnutrition.

Introduction

The definition of primary school age corresponds approximately to the period from kindergarten to secondary which begins after

the period of high mortality risk in the preschool years. Primary school age children constitute a substantial fraction of the world's population, numbering about 24% of the population of the less developed world and about 15% of that of the industrialized world. Not only are school age children a much larger proportion of the total population, but their numbers are also growing at a substantial rate (1.4% per year)¹. In consequence, by the year 2015, approximately 90% of the world's primary school age children will live in less developed countries²

Nutritional status is the aspect of development that influences behavior directly or indirectly. Operationally it is determined by taking body measurements with reference to their proportion to one another. A World Free from Hunger Report states that half of the world's underweight children live in South Asia. The estimated prevalence and number of stunted children is also alarming here. The approximate prevalence of stunting for all developing countries is 29% of all children, or 165 million children. More alarming is the likelihood that these are underestimates. According to UNICEF report (1995- 2003) Underweight children are the most prevalent problem found with 54% followed by stunted growth in 52% of the children and 17% are being wasted of Bangladeshi children.

Nutritional studies on primary school children in Malaysia show that under nutrition continue to be major health problems, both in rural and urban areas. For example, anthropometric assessment of children aged 6-12 years old from five rural communities found the prevalence of underweight among boys and girls to be 29.1% and 26.1%

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respectively³. In these communities, an average of 34.4% boys and 24.9% girls were stunted. However, the prevalence of wasting among these children (boys=8.2%; girls=6.2%) was much lower compared to the other two nutritional status indicators. A survey by the School Health Service Unit of the Health department of the City Hall of Kuala Lumpur found that among the 7 and 12 years old children, 12.5% and 16.2% were underweight⁴. In a sample of low income children between 5–10 years old showing the highest prevalence of underweight and stunting⁵. In view of the still high prevalence of under nutrition among younger school children in different less developed countries, this study was conducted to assess the nutritional status (weight-for-age, height-for-age and weight-for-height) of rural primary school children aged 8-14 years old in Sreepur upozilla. The study also focused on gender and age differentials in the children's growth status, mainly height-for-age (an indicator for chronic malnutrition) and weight-for-height (an indicator for acute malnutrition).

Materials and Methods

Methods

This descriptive cross-sectional study was conducted from May to June 2010 at two schools, Sreepur Model Govt. Primary School and Keoa Poschim Khondo Daroga Chala Register Primary School of Sreepur upazilla under Gazipur district were selected by purposive sampling. Study population was students of classes four and five attending school at the time of survey. A verbal consent was obtained from the headmasters of the schools. A total of 345 students (177 boys and 168 girls) were included in this study. A semi structured questionnaire was used to collect data through face to face interview. Data were edited, processed, and analyzed with the use of the SPSS: Version 11.0.

Measurements

Age: This was determined from the register of the school. The school insists on a birth certificate at the time of admission and thereafter the age is increased by one every year.

Height: Height in centimeters was marked on a wall in the school with the help of a measuring tape. All children were measured against the wall. The children were asked to remove the foot wear, and stand with heels together and head positioned so that the line of vision was perpendicular to the body. A glass scale was brought down to the topmost point on the head. Height was recorded to the nearest 1 cm.

Weight: A bath room scale was used. It was calibrated against known weights regularly. Zero error was checked for and removed if present every day. Clothes were not removed as adequate privacy was not available. However, as the study period was in May and June when the weather was warm, only light clothes were worn by the students. Weight was recorded to the nearest 500 grams. The anthropometric indicators recommended for child are stunting (height for age < 90%) and thinness (weight for height < 80%). These were calculated separately for boys and girls for each year of age, as the WHO reference norms vary by age and sex.

Results

Out of 345 students, 177 (51%) were boys and 168 (49%) were girls. According to Waterlow's classification, there were 56 (16.23%) normal, 282(81.74 %) undernourished and 7 (2.03%) obese/overweight children. The age group-wise undernourished, overweight & obese are seen in table-1. Among undernourished children, girls dominate the boys while the reverse in the case of normal children. The prevalence of under nutrition was highest among 10-11.9 age groups (62%). (Table I)

Table I. Nutritional Status According to Age

| Age group in years | Normal (%) | Undernourished (%) | Obese & overweight | Total (%) |
|--------------------|------------|--------------------|--------------------|------------|
| 8-9.9 | 9 (16.07) | 79 (28) | - | 88 (25.51) |
| 10-11.9 | 25 (44.64) | 175(62) | 2 (28.57) | 202(58.55) |
| 12 – 14 | 22 (39.29) | 28 (10) | 5 (71.43) | 55 (15.94) |
| Total | 56 (100) | 282 (100) | 7(100) | 345 (100) |

Based on the Waterlow classification of malnutrition among children, overall combined prevalence of being underweight; stunting and thinness were found to be 40.2 %, 57.98 % and 23.77 %, respectively. Rates of underweight (boys = 32.77%; girls = 47.62%), stunting (boys = 45.2%; girls = 71.43%), and thinness (boys = 21.47%; girls = 26.2%) were higher among girls than boys.

Table-II Prevalence of underweight, stunting & thinness by sex wise

| Sex | Underweight | Stunting | Thinness |
|-----------------|-------------|--------------|-------------|
| Boys | 58(32.77%) | 80 (45.2%) | 38 (21.47%) |
| Girls | 80(47.62%) | 120 (71.43%) | 44(26.2%) |
| Over all | 138 (40.2%) | 200 (57.98%) | 82(23.77%) |

Table III. Wasting Vs Stunting per Waterlow classification

| Weight for Height (Wasting) | Height for Age (Stunting) | | |
|-----------------------------|------------------------------|---|-----------------|
| | ≥90% | <90% | Total |
| ≥80% | n = 98 (28.40%) | Stunted n = 165 (47.83%) | 263 (76.23%) |
| <80% | Wasted n = 47 (13.62%) | Waste d and Stunted n = 35 (10.15%) | 82 (23.77%) |
| Total | 145 (42.02%) | 200 (57.98%) | 345(100%) |

Table-IV gives the association of maternal factors and malnutrition among children. More than 70% of mother's of malnourished children were illiterate compared to 55.36% of normal children. Literacy, occupation of mother and monthly family income were found to have highly significant association ($p < 0.005$) with malnutrition among their children.

Table- IV Association of Maternal Factors and Malnutrition among Children.

| Maternal Factors | Malnourished N=289 (%) | Normal N=56 (%) | Total N=345 | Significance Test |
|-----------------------------------|------------------------|-----------------|--------------|-------------------|
| Literacy | | | | |
| Illiterate | 203 (70.24) | 31 (55.36) | 234 (67.83%) | $p < 0.001$ |
| Literate | 86 (29.76) | 25 (44.64) | 111(32.17%) | |
| Occupation | | | | |
| House Wife | 101 (34.95) | 37 (66.07) | 138(40%) | $p < 0.0001$ |
| Laborer | 130 (44.98) | 11(19.64) | 141(40.87%) | |
| Service | 58 (20.07) | 8 (14.29) | 66(19.13%) | |
| Monthly Family Income (TK) | | | | |
| <3000 | 160 (55.36) | 3(5.36) | 163(47.25%) | $p < 0.0001$ |
| 3000-4999 | 90 (31.14) | 13 (23.21) | 103(29.85%) | |
| 5000-9999 | 32(11.07) | 17 (30.36) | 49(14.20%) | |
| ≥10000 | 7(2.42) | 23 (41.07) | 30(8.70%) | |

Discussion

Bangladesh registers one of the highest child malnutrition rates in SEAR. About 25% (37.5 million) of total population (150 million) of Bangladesh comprises of children a 5 to 15 years and more than 80% of children in this age group goes to school. Out of 345 students 177 (51%) were males and 168 (49%) females giving male to female ratio 1:0.95. According to Waterlow classification 81.74% of students were found to be under nourished.

The proportion of undernourished is more among females

(97.63%) than males (66.67%). Studies conducted in Ecuador in 1998 and in Tanzania in 2009 shows boys were more commonly affected than girls. The female children from very poor families do not attend school and this could be the reason for low prevalence of malnourishment among girls compared to male children in Tanzania.

According to Waterlow classification the percentage of wasting in our study was 23.77%, which is more than double compared with the wasting percentage 10.5% of the study done in Nepal^{6,7}. For stunting and both wasting and stunting also, the results were different from that of the above two studies in Ecuador and Tanzania. In our study the overall percentage of undernourished children was 81.74%, stunting 57.98% and both wasting and stunting 10.15%. These prevalence were more compared to the results obtained in the above two studies (37%, 21% and 5.4% respectively). The higher prevalence of stunting and both wasting and stunting as observed in the present study is due to the lower socioeconomic status of the people in the study area.

There are many factors that directly or indirectly cause malnutrition among children. Women's educational and social status, national per capita income, food availability, and access to safe water are important underlying determinants of child malnutrition⁸. Some studies suggested that high prevalence of low birth weight, poor hygiene, inadequate child care and feeding practices, and the low status of women in society are key factors that explain high rates of child malnutrition⁹. The present study shows highly significant association of maternal literacy, occupation, income on child malnutrition. Economic status of the household is associated with the general health and development status of the family.

Literate mothers adopt many improved behaviors related to maternal and child health care, feeding and eating practices which ultimately affect the nutritional status of children. The present study shows that 70.24% of mothers of malnourished children are illiterate. This finding is also similar to the findings from studies from Nepal¹⁰ and NFHS (National Family Health Survey) from India¹¹.

A high prevalence of stunting has been reported from India. The report on regional WHO Consultation on nutritional status of children reported 45% prevalence of stunting among girls and 20% among boys with an average of 32% in both sexes¹¹. In our study the prevalence was 71.43% among girls and 45.2% among boys with an overall prevalence of 57.98%. A similarity in the prevalence of stunting in boys and girls from developing countries has also been found by other workers¹². Thinness as defined by Weight for Height <80% was present in 21.47% of boys and 26.2% of girls in this study. In a study in government and public schools of Delhi, the prevalence of stunting was 9.9% in upper socioeconomic class girls and 35.3% in lower middle class girls¹³.

The poor nutritional status of girls has important implications in future life in terms of physical work capacity and adverse reproductive outcomes¹⁴. School based mid day meal programme and iron supplementation should receive priority in rural areas.

Improved child health and survival are considered as universal humanitarian goals. In this respect, understanding the nutritional status of children has far-reaching implications for the better development of future generations. Malnutrition continues to be a problem of considerable magnitude in most developing countries of the world. Several studies^{11,12} have shown that dietary and environmental constraints are the determinants of nutritional status of countries. In the present study stunting reflects a failure to reach the linear growth potential due to suboptimal health and/or nutritional conditions, underweight reveals a low body mass relative to chronological age, which is influenced by both child's height and weight.

In this study, approximately 40.2% (n = 138), 57.98% (n = 200) and 23.77% (n = 82) of the children were found to be underweight, stunted and wasted respectively (Table 2). Which has its implications on the child's consequent development (e.g. cognitive skills).

As stunting reflects past nutrition, the finding indicates that these children may have had experiences with poor diets and infections during their early childhood and perhaps were continuously living with similar conditions as a consequence of poverty. Nutritionists have argued that children in less developed countries can attain their optimum weight and height if the environment is conducive to their health and nutritional status.

Conclusion

This study provided evidence that these children were under acute and chronic nutritional stress. Hence, the screening for common health problems and the assessment of nutritional status should be an essential part of school health services. Early detection and appropriate treatment of malnourished children must be done prior to school entry, to avoid complications like stunting and wasting.

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