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Nutritional Status of 7-12 Years Children from Rural Part of Rangpur City, Bangladesh

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Abstract:

This study was conducted among 7-12 years old school going children in rural area of Rangpur city, Bangladesh. The major goal of this study was to identify socioeconomic information and assess nutritional status of school children. Study was carried out at different schools. Sample of 134 students (boys=61, girls=73) were participated in the survey. Data on student's age, parental education level, occupation, body weight, height, BMI were collected. The occupations of household head were mainly farmer or labor (52.2%) while 92.5% participant's mothers were engaged them in household work. Anthropometric indices of height for age (HAZ) and Body Mass Index for Age (BAZ) z-score were used to estimate the children's nutritional status. It was found for HAZ that 7% were moderately stunted, 24% were mildly stunted, 57% were normal, 5% were mild oversized and 7% were oversized among boys. Among girls, 2%, 7%, 27%, 45%, 11% and 8% were severely stunted, moderately stunted, mildly stunted, normal, mild oversized and oversized respectively. For BAZ, about 43% boys and 45% girls had healthy weight. The prevalence of wasting was presented higher among boys than girls and prevalence of obesity was presented higher among the girls than boys. As most of the children were wasted, underweight and stunted, it should be provided community education concerning about nutritional knowledge, sanitation and personal hygienic practices, and weaning practices, nutritional deficiency diseases, nutritional value of food and dietary practices that increase the awareness of rural parents to take care their children with balance diets.

Key words: Socio-economic status, child nutrition, waste, stunt, WHO reference and Z-Scores

ABBREVIATIONS

BAZ= BMI for age z-score
BMI= Body Mass Index
HAZ= Height for age z-score
SD= Standard Deviation
TV=Television
WHO= World Health Organization

1. INTRODUCTION

Good nutrition is a prerequisite for the national development of countries and for the well-being of individuals. Although problems related to poor nutrition affect the entire population, children are especially vulnerable because of their unique physiology and socioeconomic characteristics [1]. Protein-energy and micronutrient deficiencies interfere with optimal physical growth and cognitive development. Common illnesses such as diarrhea and acute respiratory infections are also common in young children [2].

Poor nutritional status is a major health problem in developing countries including Bangladesh [3, 4]. Young children are especially vulnerable to nutritional deficits and micronutrient deficiencies. At the individual level, inadequate or inappropriate feeding patterns lead to malnutrition. Numerous socioeconomic and cultural factors influence patterns of feeding and nutritional status [1].

Bangladesh is one of the countries with very high burden of malnutrition. Although Bangladesh has already achieved a remarkable progress in reducing child malnutrition from 68% in the late 1980s to 41% in 2007, still malnutrition is a common problem in this country [5, 6].

Malnutrition among children is a critical problem because its effects are long lasting and go beyond child-hood. It has both short- and long-term consequences. For instance, malnourished as compared to non-malnourished children are physically, emotionally and intellectually less productive and suffer more from chronic illnesses and disabilities. Malnutrition among children depends on complex interactions of various factors reflecting socio-demographic, environmental, reproductive, institutional, cultural, political and regional factors [4, 7, 8].

A lot of studies found that the prevalence of malnutrition were higher in the rural or undeveloped area compared to urban area. Hence, this study was undertaken to identify socio-economic status of family and the nutritional status of 7-12 years school going children among the undeveloped part in Rangpur city, Bangladesh.

2. MATERIALS AND METHODS

This study was conducted in rural part of Rangpur city, which was focused on nutritional status of school going children. Data was collected from different local school of that area among children of 7 to 12 years old. Total number of students participated in the survey was 134. Data was collected during May 2016

Anthropometric measurements taken were weight, height and Body Mass Index (BMI). The instruments that were used for anthropometric measurements were digital weighing scale, stadiometer as well as measuring tape. WHO-2007 reference was used to compare the differences in the prevalence of malnutrition among the children [9].

For measuring weight, the children were asked to stand straight in the middle of the scale's platform without touching anything and the eyes were looking at the horizontal line. For measuring height, the children were asked to stand straight and look straight in a Frankfurt horizontal plane while the top of the stadiometer was lowered to the head [10].

Data of the children's and their families were collected by using a questionnaire, that was modified from several studies was used to collect data. The questionnaire basically asked to obtain relevant information on anthropometric, socio-economic and demographic information (children characteristics, health, condition etc.).

The research data were being analyzed by WHO AnthroPlus software.

3. RESULT

3.1 Demographic data

Table 1 shows demographic profile of 7-12 years children. In this study, 134 (n=134) subject completed and returned the questionnaires. It appeared that 45.5% (n=61) of participants were male while 54.5% (n=73) were female. Majority of the participants were Muslim with 96.3% (n=129) and only 3.7% (n=5) were Hindu.

Besides that, 27.6% of the participants were aged 11 years old and appeared to be majority of the participants while 6.7% were aged 7 years old with least number of participants.

Table 1 also shows that the occupations of household head were mainly labor or farmer about 52.2% (n= 70), service holder 26.1% (n=35) and small business 21.6% (n=29) while mothers were engaged mainly household work about 92.5%, Govt. and private services holder 6.7% and only 0.7% small business.

Table 1: Demographic profile of children (sample size, n=134)

Parameters		No.	Percentage	Parameters		No.	Percentage
Gender	Male	61	45.5	Children's age	7 years old	9	6.7
	Female	73	54.5		8 years old	18	13.4
Religion	Muslim	129	96.3		9 years old	26	19.4
	Hindu	5	3.7		10 years old	31	23.1
Father's Education	Master	3	2.2		11 years old	37	27.6
	Honor's	11	8.2		12 years old	13	9.7
	HSC	31	23.1	Father's occupation	Services holder	35	26.1
	Others	89	66.4		Small Business	29	21.6
Mother's Education	Master	1	0.7		Others (labor/farmer)	70	52.2
	Honor's	1	0.7	Mother's occupation	Services holder	9	6.7
	HSC	21	15.7		Small Business	1	0.7
	SSC	40	29.9		Household	124	92.5
	Others	71	53				

Table 2 shows that, majority (91.8%) of the children likes and participates in indoor or outdoor sports. Among them, 46.3%

(n=57) were play every day in a week while majority (n=73) of the children spend ≤1 hour in sports related activities.

Most of the students about 87.3% (n=117) like homemade food where 12.7 % like food from store. During tiffin period about 51.5% (n=69) of students take foods from the shops inside the school and 48.5% (n=65) of the students bring foods from home for their school meals. About 44.8% (n=60) children watch TV in home during taking their meal.

Table 2: Involvement in extracurricular activities and food habit of children.

Parameters		No.	Percentage	Parameters		No.	Percentage
Like to Play	Yes	123	91.8	Food you like	Home made	117	87.3
	No	11	8.2		From Shops	17	12.7
Days per week to play	7 days	57	46.3	Food during tiffin period	Home made	65	48.5
	1-6 days	66	53.7		Shops	69	51.5
Hour per day to play	≤1 hour	73	59.4				
	>1 hour	50	40.6	Watching TV during eating	Yes	60	44.8
					No	74	55.2

3.2 Nutritional status and anthropometric information

Fig. 1 shows the nutritional status of the 7-12 years children using the indicator-Height for age (HAZ) z-score according to WHO growth reference 5-19 years.

From the growth performance of children using the indicator height for age according to the z-score, 7% (n=4) were moderately stunted (-3 to -2 SD), 24% (n=15) were mildly stunted (-1.99 to -1.00 SD), 57% (n=35) were normal (-0.99 SD to 0.99 SD), 5% (n=3) were mild oversized and 7% (n=4) were oversized among boys. Among girls, 2% (n=1), 7%(n=5), 27% (n=20), 45% (n=33), 11% (n=8) and 8% (n=6) were severely stunted(<-3 SD), moderately stunted (-3 to -2 SD), mildly stunted (-1.99 to -1.00 SD), normal (-0.99 SD to 0.99 SD), mild oversized (1 to 1.99 SD) and oversized (≥2)respectively.

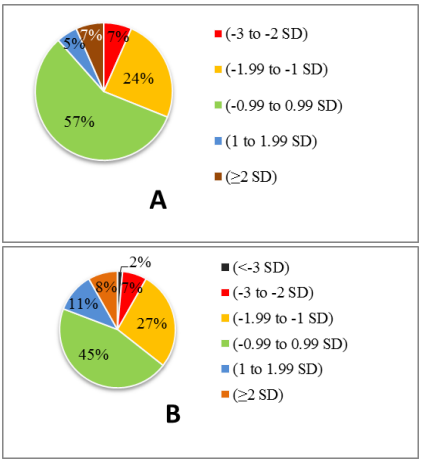

Fig. 1: Nutritional Status of 7-12 years Children (A=boys, B=girls) of Height for Age (HAZ) Z-Score According to WHO reference.

Fig. 2 shows the nutritional status of the 7-12 years children using the indicator-BMI for age (BAZ) z-score according to WHO growth reference 5-19 years.

According to WHO reference, the higher percentage of children among boys 43% (n=26) were normal (-0.99 to 0.99 SD) compared to 45% (n=33) of children among girls. 8% (n=5), 11% (n=7) and 33% (n=20) children were in severely wasting (<-3SD), moderately wasting (-3 to -2 SD) and mild wasting (-1.99 to -1 SD) respectively among boys. On the other hand, 4% (n=3), 16% (n=12) and 25% (n=18) children were in severely wasting (<-3SD), moderately wasting (-3 to -2 SD) and mild wasting (-1.99 to -1 SD) respectively among girls.

Furthermore, 2% and 3% children among boys were moderate overweight (2.01 to 3SD) and obese (>3SD) respectively where 6% and 4% children among girls were moderate overweight (2.01 to 3SD) and obese (>3SD).

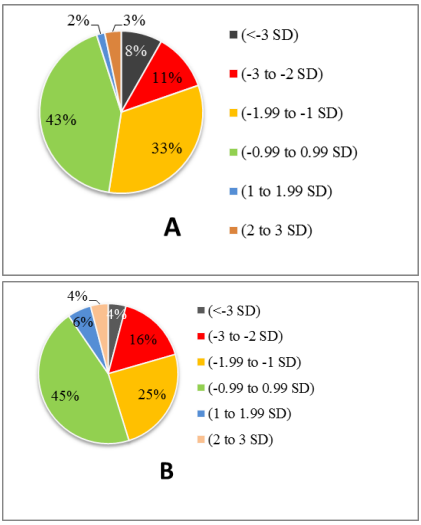

Fig. 2: Nutritional Status of 7-12 years Children (A=boys, B=girls) of BMI for Age (BAZ) Z-Score According to WHO reference.

4. DISCUSSION

The nutritional status among 7-12 years children in Rangpur city area of Bangladesh was assessed. Nutritional status is the condition of health of the individual as influenced by the utilization of the nutrients. Child malnutrition is a particular concern in developing countries that affects millions of young children [11]. The factors influencing nutritional status of children are age, weight, height, family income, family size, food habit, extracurricular activities etc. Hence the present study was formulated to assess age, height and weight as indicators of growth and nutritional status of 7-12 years children and find the major socio-economic correlates of nutritional status in this group of children.

This study showed that about 68% children ages were within 10-11 years. It also appeared that 96.3% of the participants were Muslim and only 3.7% were Hindu in this area. The occupation of father and mother is directly related to

monthly income and strong determinant of nutritional status of children. About 52.2% of the participant's fathers were farmer or labor while 92.5% participant's mothers were engaged them in household work.

In this study minority of the children spend more than 1 hour in extracurricular activities. Similar studies were found in Saha (2012), who stated that 18.75 % of students spend more than 1 hour in extracurricular activities [12]. The trend of taking food in school in this study also similar to the study completed by Saha (2012), who stated that about 65.6% of students take foods from the shops inside the school and only 34.4% of the students bring foods from home for their school meals.

Height, weight and BMI are the most commonly used measures as rapid, inexpensive to obtain and they are easy to use. The anthropometric data (weight and height), in this study were entered and analyzed using WHO AnthroPlus software.

For height for age (HAZ), the incidence of stunning exist in this study. But severely stunted children found among the girls compared to absent among boys. Based on this study, there is also several stunted condition among girls more than boys which also similar as stated by Senbanjo *et al.* (2011) [13]. Senbanjo *et al.* found that the prevalence of stunting was higher among young female children aged. There are maybe several factors that make this condition to appear such as socioeconomic status, food habit, educational level, nutritional knowledge, extracurricular activities etc. According to Sereebutra *et al.* (2006), 34.4% of rural children in Guatemala were stunted and the reason that they found that cause this condition was caregiver educational status [14].

For BMI for age (BAZ), about 43% boys and 45% girls had healthy weight. The prevalence of wasting was presented higher among boys than girls. The results from this survey also found that the prevalence of obesity was presented higher

among the girls than boys. A study done by Mirhosseini *et al.* (2011) found that lower level of physical activity level among girls in Iran had higher anthropometric indices and fat mass [15]. The difference results between these studies might be due to average family expenditure for food, food habit frequency, physical activities, socio-economic status and geographical condition.

5. CONCLUSION

This study was carried out to know the nutritional status of children and WHO reference was applied to nutritional assessment according to age, BMI and Height. This study found that there was a difference between anthropometry status of children age and sex. There was severe malnutrition among the children as most of the children were underweight, stunted and wasted. But prevalence of severely stunted children found among the girls compared to absent among boys while severely wasting were higher among boys than girls. The low values for anthropometry and socio-economic condition obtained from this study propose that there is need for improvement in the nutritional status of these children. Improvement of the nutritional level of today's children should be given top priority. There should be some training or any other education concerning about nutritional knowledge, sanitation and personal hygienic practices, and weaning practices, nutritional deficiency diseases, nutritional value of food and dietary practices that increase the awareness of rural parents to take care their children with balance diets.

Conflict of interest and funding

The authors have not received any funding or benefits from industry or elsewhere to conduct this study.

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