

# Nutritional status and hygiene practices of primary school children

## Abstract

**Background:** Despite the economic growth observed in developing countries, malnutrition is still highly prevalent. The school age is a dynamic period of growth and development. Poor health and malnutrition may impair both the growth and cognitive development of primary school children. The aim of this study carried out the nutritional status and basic hygiene practice among the primary school children in Dhaka city, Bangladesh.

**Methods:** This was a cross-sectional study conducted among 110 primary school children aged between 6 to 12 years at Nilkhet High School in Dhaka city, Bangladesh. The samples were selected by using simple random method and face to face interview adopted through semi structured questionnaire. Nutritional status was determined by according to WHO classification. Collected data were analyzed by using SPSS version of computer technology.

**Result:** Among respondents 66.40%(73) were boys and 33.60%(37) were girls. In case of WAZ, 19.10% were below normal, 79.10% were normal and 1.80% was above normal. In case of HAZ, 11.80% were below normal, 80% were normal and 2.70% were above normal. And in case of WHZ 18.20% were below normal, 55.50% were normal and 1.80% were above normal. Regarding hygiene practice, 100% respondents washed hand before and after meal, as well as 99.10% washed hand after coming home from outside area. For brushing teeth, 34.2%(25), 57.5%(42) and 8.2%(6) boys brushed teeth one, two and three times everyday respectively, where 21.6%(8), 56.8%(21) and 21.6%(8) girls brushed teeth one, two and three times everyday respectively.

**Conclusion:** This study showed that malnutrition is widely prevalent among primary school children. Appropriate screening in school health program and proper nutrition education program may be recommended as early as possible.

**Keywords:** nutritional status, hygiene practice, school children

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**Abbreviations:** WAZ, weight-for-age z-scores; HAZ, height-for-age z-scores; WHZ, weight-for-height z-scores; BMI, body mass index

## Introduction

In modern age malnutrition continues to be a serious public health problem.<sup>1</sup> Despite the economic growth observed in developing countries, malnutrition and particularly under-nutrition is still highly prevalent.<sup>2</sup> Malnutrition is usually the result of a combination of inadequate dietary intake and infection. In children, malnutrition is synonymous with growth failure. Malnourished children are shorter and lighter in weight than they should be for their age.<sup>3</sup> With the high incidence of poverty and HIV/AIDS, prevalence of malnutrition is also high.<sup>4</sup> Malnutrition needs to be viewed as an indication of inadequate provision of some of the most basic of all human rights. It is also a reflection of inadequate investment and progress in a range of issues related to human capital development and has a significant influence on the future economic development of a country.<sup>5</sup> Some studies are now highlighting the problem of micronutrient deficiencies among schoolchildren in particular.<sup>6,7</sup> The school age is a dynamic period of growth and development. During this period physical, mental, social development of child takes place.<sup>8</sup> Poor health and malnutrition may impair both the growth and cognitive development of primary school children. School children are dramatically affected by anemia,<sup>7</sup> vitamin A deficiency<sup>9</sup> and parasitic infections<sup>10</sup> with adverse impact on

their nutritional status<sup>10,11</sup> as well as on their cognitive development and school performance also.<sup>12-15</sup> There is growing evidence of considerable burden of morbidity and mortality due to infectious diseases and malnutrition in school children in developing countries. Studies in different countries identified the following in primary school children: respiratory problems, diarrheal disease, nutritional disorders, anemia, parasitic infestations, pediculosis, caries teeth, refractive errors, skin diseases, ear and throat problems, tic disorders, sleeping disorders etc.<sup>15-27</sup> Stunting and wasting are wide spread among school age children in developing countries.<sup>28-32</sup> High levels of stunting among children suggest that there will also be a long term deficit in mental and physical development that leaves children unable to take maximum advantage of learning opportunities in schools. Epidemiological evidences suggest a strong link between maternal and early childhood under nutrition and increased adult risk of various chronic diseases.<sup>33</sup> According to WHO criteria, 52% of school going children in under developed countries are considered normal, where 48% of them are malnourished and 10% of them are severely malnourished.<sup>34</sup> More than 200million school children are stunted and if no action is taken and at this rate, about 1billion stunted school age children will be growing up by 2020 with impaired physical and mental development.<sup>35</sup> Bangladesh is also facing high poverty and child under-nutrition rates.<sup>36</sup> More than 54% of preschool-age children, equivalent to more than 9.5million children, are stunted, 56% are underweight and more than 17% are wasted.<sup>37</sup> Almost same condition will found when this children starts to go school.

In the developing countries like Bangladesh, due to poor hygiene practices the school-age children often experience increased burden of communicable diseases that decreases their ability to attend school regularly and to learn their full potential also.<sup>38</sup> A large fraction of the world's illness and death is attributable to communicable diseases.<sup>39</sup> Sixty-two percent and 31% of all deaths in Africa and Southeast Asia, respectively, are caused by infectious disease.<sup>40</sup>

The aim of this study was to assess the nutritional status and their hygiene practice among the primary school children in urban area of Dhaka city in Bangladesh.

## Methodology

### Study design

This was a cross-sectional study conducted in 2012.

### Study area and population

From January 2012 to June 2012, we conducted this study in the Nilkhet High School, situated in Nilkhet area of Dhaka metropolitan city of Bangladesh. Although Nilkhet is in urban area but this place is highly dense with low and middle income people. Students in primary level age between 6 to 12 years in Nilkhet high school were the population of this study.

### Study sample and sampling method

We adopted random sampling method to conduct this study. About 110 children were assigned randomly to collect data.

### Data collection tools and techniques

A questionnaire was developed containing both closed and open ended questions to obtain relevant information on socioeconomic, anthropometric, and hygiene practice. All questions were designed, pre-tested, modified and resettled to obtain as well as record information easily. The purpose of the pre-test was to test the content, working expression, the topical sequence of questions, duration of the interview and the reliability of some items. After pre-test the individual questionnaire which was related for quantitative data, improved and reformed to ensure content coverage, the reliability and validity of the study.

### Age detection

Age of the subjects under study was determined by interrogation and confirmed through probing. The age of the children was collected from the school record as well as respondents itself. If it was not possible to ensure approximate age by asking some local and national incidence occurred at that period.

The anthropometrical data (weight and height) were taken individually by the following standard Procedure:

### Measuring body weight

Weight was recorded in kilograms by using standard weighting machine. During measuring weight, each subject was asked to bare footed and to remove heavy cloth.

### Measuring height

For measurement of height, subjects were positioned to stand on the platform, bare footed with their head upright, looking straight

forward by using standard height measurement scale. Height was measured to the nearest 0.1 cm.

### Data verification

Questionnaires were checked each day after interviewing and again these were carefully checked after completion of all data collection and coded before entering into the computer. To minimize the errors, after entering the data set into the computer, these are checked and resolved by correction.

### Assessment of nutritional status

The nutritional status of school children was assessed by anthropometric measurements viz., height in centimetre (cm) and weight in kilograms(kg). It was determined by Z-score value according to WHO classification.

### Assessment of hygiene practice

Some basic hygiene practice related questions were asked like hand washing practice, brushing practice, using sandal all day.

### Data analysis

Data were processed and analyzed statistically by using SPSS 15 software. To ensure data quality, data of 30% of the records were entered twice.

### Ethical issues

Initially explained the purpose and objective of the study to the Headmistress and permission was taken to conduct this study. Verbal consent was taken from mothers and as well as from children who were able to understand. This was a self funding study and no external fund was provided to carry out this study.

## Results

Table 1 shows that among 110 school children 66.40%(73) were boys and 33.60%(37) were girls. In the age distribution, 1.80%(2) children were boys and 2.72%(3) were girls whose age was 7 years . About 20%(22) were boys and 9.09%(10) were girls whose age was 8 years . Similarly, 13.63%(15) and 10.90%(12) were boys and girls in the age of 9 years . 18.18%(20) and 7.27%(8) were boys and girls in the age of 10 years . About 8.18%(9) and 2.72%(3) were boys and girls in the age of 11 years and 4.54%(5) and 0.90%(1) were boys and girls in the age of 12 years . In case of father's occupation of school children, 55.50%(61) were Government service holder, 27.30%(30) were in private job and 17.30%(19) were business man. In case of mother's occupation, 9.10%(10) mothers engaged job and 90.90%(100) mothers was housewife. About 50%(55), 46.4%(51) and 3.6%(4) school children had sibling one to two, three to four and more than four respectively.

Table 2 showed that among 110 school children, about 93.6%(103) respondents were underweight, 6.4%(7) were normal and no overweight had found.

Table 3 showed 19.1%, 11.8% and 18.2% of children suffered moderate underweight, stunting and wasted respectively.

Table 4 showed that 93.60% children had BMI below normal and 6.40% children had normal BMI and no overweight has found. In case of WAZ, 19.10% were below normal, 79.10% were normal and 1.80% was above normal. In case of HAZ, 11.80% were below normal, 80%

were normal and 2.70% were above normal. And in case of WHZ 18.20% were below normal, 55.50% were normal and 1.80% were above normal.

In case of basic hygiene practice, 100% respondents washed hand before and after meal, 99.10% washed hand after coming home from outside area. For brushing teeth, 34.2%(25), 57.5%(42) and 8.2%(6) boys brushed teeth one, two and three times everyday respectively, where 21.6%(8), 56.8%(21) and 21.6%(8) girls brushed teeth one, two and three times everyday respectively. In case of using sandal all the day 97.3%(71) boys used sandal where 2.7%(2) boys didn't use sandal all the day and 81.1%(30) girl used sandal where 8.2%(9) girls didn't use sandal all the day (Table 5).

**Table 1** Socio-demographic characteristics of the school children (n=110)

Items	Frequency	Percent		
<b>Gender</b>				
Boy	73	66.4		
Girl	37	33.6		
<b>Age (years)</b>				
	<b>Boy</b>	<b>Girl</b>	<b>Boy</b>	<b>Girl</b>
7	2	3	1.8	2.72
8	22	10	20	9.09
9	15	12	13.63	10.9
10	20	8	18.18	7.27
11	9	3	8.18	2.72
12	5	1	4.54	0.9
Total	73	37		
<b>Father's occupation</b>				
Govt. Job	61	55.5		
Private Job	30	27.3		
Business	19	17.3		
<b>Mother's occupation</b>				
Job	10	9.1		
Housewife	100	90.9		
<b>Siblings</b>				
One to two	55	50		
Three to four	51	46.4		
More than four	4	3.6		

**Table 5** Distribution of Hygiene practice of school children (n=110)

<b>Hand washing practice</b>			
Category	Wash hand (%)	Do not wash hand (%)	Irregularly wash hand (%)
Before meal	100(110)	0.00(0)	0.00(0)
After toilet with soap	100(110)	0.00(0)	0.00(0)
After coming home from outside area	99.10(109)	0.90(01)	0.00(0)

**Table 2** Nutrition status of children (n=110)

Status	Frequency	Percent
Underweight	103	93.6
Normal	7	6.4
Total	110	100.0

**Table 3** Distribution of weight for age, height for age and weight for height Z-score (n=110)

Range	Frequency	Percent
<b>WAZ</b>		
<-2.00SD	21	19.1
-2.00 to +1.99 SD	87	79.1
2.00 to 2.99 SD	2	1.8
Total	110	100.0
<b>HAZ</b>		
<-2.00SD	13	11.8
-2.00 to +1.99SD	88	80.0
2.00 to 2.99SD	3	2.7
>=3.00SD	6	5.5
Total	110	100.0
<b>WHZ</b>		
Valid <-2.00SD	20	18.2
-2.00 to +1.99SD	61	55.5
2.00 to 2.99SD	2	1.8
Total	83	75.5
Missing system	27	24.5
Total	110	100.0

WAZ, weight for age; HAZ, height for age; WHZ, weight for height

**Table 4** Summary of nutritional status (n=110)

Nutritional status	Students (%)			
	BMI	WAZ	HAZ	WHZ
Under the Normal	93.60	19.10	11.80	18.20
Normal	06.40	79.10	80.00	55.50
Over the Normal	00.00	01.80	02.70	01.80
Obese	00.00	00.00	05.50	00.00

BMI, body mass index; WAZ, weight for age; HAZ, height for age; WHZ, weight for height

Table continued..

Hand washing practice							
Brushing teeth practice							
Sex		Frequency of brushing teeth					
		One	Two	Three	Total		
Boy	Count	25	42	6	73		
	% within Sex	34.2%	57.5%	8.2%	100.0%		
Girl	Count	8	21	8	37		
	% within Sex	21.6%	56.8%	21.6%	100.0%		
Total	Count	33	63	14	110		
	% within Sex	30.0%	57.3%	12.7%	100.0%		
Using sandal all the day		Sandal using		Total			
Boy		Use sandal	Do not use sandal				
		Count	2	73			
Girl		% within Sex	2.7%	100.0%			
		Count	30	7	37		
Total		% within Sex	81.1%	18.9%	100.0%		
		Count	101	9	110		
		% within Sex	91.8%	8.2%	100.0%		

## Discussion

Study showed that majority(93.6%) of the school children were suffering from under weight(BMI) and very few(6.4%) of them had normal BMI. Similar findings had found in the study done by Adhikary M et al.,<sup>40</sup> among primary school children in one Upazila(sub district) where it was found that more than two third children were underweight.<sup>41</sup> According to WHO 48% of children were malnourished and 10% of them were severely malnourished.<sup>34</sup> In case of WAZ, more than two thirds(79.10%) were normal. In case of HAZ, almost majority(80%) were normal and in case of WHZ, more than half(55.50%) were normal range. Previous study found that more than 54% of preschool-age children, equivalent to more than 9.5million children, were stunted, 56% were underweight and more than 17% were wasted.<sup>37,42,43</sup>

Study found that almost all(99.10%) children washed hand before taking meal. More than half of boys(57.5%) and girls(56.8%) brushed teeth two times every day and majority(91.81%) of the children used sandal all the day. This finding showed the improvement of hygiene practice among the school children in Bangladesh.<sup>32-34</sup>

## Conclusion

This study provides that malnutrition among the primary school children is still high. Hence, screening for common health problems with assessment of nutritional status is essential for school health program. Although the findings of this study can't be generalize but still it represents the similar findings of other studies. However, early detection and appropriate treatment for malnourished children must be done prior to school entry, otherwise this will create huge burden for the nation.

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## Conflict of interest

Author declares that there is no conflict of interest.

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