



## A Study on Understanding the Relationship between Predisposing and Enabling Factors on Nutritional Status among Secondary School Students

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### Abstract

Child malnutrition coexists in households and communities in Bangladesh due to illiteracy, poverty and knowledge which leading to a risk of disease and mortality. This study is a descriptive cross sectional study, which assessed nutritional status and related factors among high school children. In this study only 52.5% of respondents had a healthy weight. While 45% were underweight and 2.5% were overweight. The relationship between nutritional status and some independent variables at 5% level of significance were birth order ( $P=0.003$ ), snacking habit ( $P=0.000$ ), taking care of respondents ( $P=0.007$ ), fathers' occupation ( $P=0.019$ ), mothers' education ( $P=0.007$ ), earning person of the family ( $P=0.028$ ) and money for snacking ( $P=0.020$ ). Based on results, it's suggested that periodical monitoring and evaluation of nutritional status of the students should focus on underweight students. Supplementary support from school is still needed, to assist daily intake of students still underweight especially. Health and nutrition education should be taught.

**Key words:** BMI, Enabling factor, Nutritional status, Predisposing factor, Secondary school students

### Introduction

Malnutrition is widespread problem and affects large number of people in developing countries. Vulnerable populations like school children are susceptible to health problems associated with micronutrient deficiencies. Malnutrition in children is the largest contributor to global burden of disease and causing heavy health expenditures in developing countries especially in Asia. In Asia, it was common in preschool children from 16.0% in China to 64.0% in Bangladesh (Khor, 2003). A study conducted in BANGLADESH by Bangladesh Bureau of Statistics and UNICEF it had found that using the new WHO (2005) GRS, 40% of children aged <5 years were underweight. According to criteria of the World Health Organization, the prevalence of Underweight and stunting was "very high". Severe underweight were found in 11% of the population. In comparison with the urban population, the rural Population was significantly more underweight (42% vs. 30%) (CMNSB, 2005). In a second study stunting was also found to increase with age where younger school student were reported to have a prevalence of just 2% compared to 16% among older school children in Bangladesh (Ahmed, 2005). UNICEF (1990) said that one in every four children under-five (including 146 million children in the developing world) is underweight. Childhood malnutrition is associated with a number of socioeconomic and environmental characteristics such as poverty, parents' education/occupation, and access to health care services (Delpeuch *et al.*, 2000). The strong relationship between socio-demographic factors and secular growth was shown in some studies (Musaiger, 2004). Among population groups who have experienced constraint on economic and social development and factors affecting the physical growth of school children before puberty are environmental, e.g., poor food consumption pattern, illness, lack of sanitation, poor hygienic practice, food safety and women's education (UNICEF, 1990). The prevalence of underweight, stunting and wasting was

significantly higher among mothers with low education status (CMNSB, 2005). A small state of Kerala in India, it has the highest rate of female literacy 87.86% compared to 54.16% for all India (Got, India, 2002). Kerala's infant mortality rate is 15.3 per 1,000 births versus 57.0 for India (Suryanarayana, 2008). Malnutrition adversely affects physical and mental growth of children. So this study was aimed to identify nutritional status of children and to discover the factors which related with nutritional status. This study gives the prevalence of malnutrition and associated factors at countryside region in Bangladesh.

### Materials and Methods

#### Study site

This study was carried out at Santosh Janhabhi High School in Tangail town for a period of three months from September to November 2013.

#### Study design

This study was descriptive cross sectional study.

#### Study population

The study population was the 10 grade students of Santosh Jhannobi High School of the Santosh village of Tangail Sadar.

#### Sample size

There were 200 class grade 10 students of selected school. Among them we selected 120 students for our study.

#### Sampling

Purposive sampling technique was used.

#### Study type

Mixed method both quantitative and qualitative.

#### Development of questionnaire

A structured questionnaire was used for data collection. Initially, the questionnaire was prepared in English by the researcher, to collecting data. The questionnaire mostly multiple choice questions and some like snacking habit, religion, height, weight, BMI, money

spend for snacking and earning person of family. The questionnaire contains 3 parts as follows Socio demographic factors, knowledge toward health and nutrition and Enabling factors regarding on nutritional status.

**Test of validity and reliability**

Before data collection, the questionnaire was pre-tested for validity and reliability. The questionnaire was adapted according to the comment and suggestion from by the expert.

**Collection of data**

Questionnaire was asked passively and cautiously not to influence the respondents. Socio-economic status (SES) data, health and nutritional knowledge, other data of the children’s and their families were collected by using standardized questionnaire.

**Collection of anthropometric data**

Height and weight of the students were collected based on standard methods (WHO, 2003). Omron digital weighing machine and Fujita stadiometer were used for measuring weight and height respectively. A bathroom scale was used to measure body weight of the study respondents. Weight was measured up to 100g and height was measured up to 0.1cm fractions. After measuring weight and height BMI was calculated by using the following formula: weight in kg divided by height in m<sup>2</sup> = BMI (in Kg m<sup>-2</sup>). Body mass index (BMI) categories were defined using age and sex-specific growth chart by the US Centers for Disease Control and Prevention.

**Data verification and analysis**

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. The data was edited if there was any discrepancy. All of the statistical analysis and all other data processing were done by using SPSS 16.0 windows program. For tabular representation Microsoft Word were used. Chi-square was used to test the relationship between independent and dependent variables. Statistical significance was represented by a P value < 0.05.

**Results**

**Table 1:** Percent distribution of nutritional status of the respondents

Nutritional Status	Total Respondents (n=120)	
	n	%
Under weight	54	45.0
Healthy weight	63	52.5
Over weight	3	2.5

Table 1 shows the percent distribution of the students by nutritional status. Nutritional status of the students was determined by measuring BMI. Then the BMI was plotted into CDC growth curve (Krebs and Jacobson, 2003). CDC growth curve categorize nutritional status into four categories. Underweight (<5 Percentiles curve from growth chart), healthy weight / Normal (>5 to 85 Percentiles), at risk overweight (>85 to 95 Percentiles), and overweight (>95 Percentiles). Regarding the classification of nutritional status, most of respondents (52.5%) had healthy weight, 45% of them were underweight and 2.5% were overweight.

**Table 2.** Relationship between nutritional status and predisposing factors

Predisposing Factors	Percentage %	Frequency n	Chi Squire (P-Value) (Relationship with nutritional status)
<b>Number of brothers and/or sisters</b>			
No brothers and/or sisters	20	24	0.187
One	47.5	57	
Two	27.5	33	
Three	5	6	
<b>Age</b>			
Below 15 years	40.83	49	0.963
15 years and above	59.16	71	
<b>Gender</b>			
Male	55	66	0.348
Female	45	54	
<b>Birth order</b>			
1 <sup>st</sup> birth	35	42	0.003
2 <sup>nd</sup> birth	55	66	
>2 <sup>nd</sup> birth	10	12	
<b>Snacking habit/day</b>			
Below two times	65	78	0.000
Above two times	35	42	
<b>Knowledge level</b>			
Poor	49.17	59	0.154
Fair	35	42	
Good	15.83	19	

**Table 3.** Relationship between nutritional statuses and enabling factors

Enabling Factors	Percentage %	Frequency n	Chi Square P-Value (Relationship with nutritional status)
<b>Type of accommodation</b>			
Parents	99	82.5	0.338
Relative	15	12.5	
Hostel	6	5	
<b>Taking care</b>			
Parents	99	82.5	0.007
Relative	15	12.5	
Others	6	5	
<b>Fathers' occupation</b>			
Govt. employee	17	14.17	0.019
Private employee	12	10	
Farmer	21	17.5	
Business or others	70	58.33	
<b>Mothers' occupation</b>			
Govt. employee	3	2.5	0.518
Housewife	117	97.5	
<b>Fathers' education</b>			
Illiterate or primary	66	39	0.371
High school or college	45	63	
Bachelor or others	9	18	
<b>Mothers' education</b>			
Illiterate or primary	60	50	0.007
High school or college	57	47.5	
Bachelor or others	3	2.5	
<b>Earning person of the family</b>			
One	105	87.5	0.028
Two	12	10	
Three	3	2.5	
<b>Number of family member</b>			
Up to 5 member	90	75	0.093
>5 member	30	25	
<b>Money for snacking per day</b>			
<10 BDT	45	37.5	0.020
11-20 BDT	63	52.5	
>20 BDT	12	10	

**Discussion**

**Relationship between nutritional status and predisposing factors**

Malnutrition is largely the by-product of insufficient education, low income, poverty, occupation, ignorance, large family size etc. Many factors might relate with nutritional status of children will be presented as follows.

Among the respondents 20% respondent had no brother brothers and/or sisters, 47.5% had one, 27.5% had two and 5% had three brothers and/or sisters. In this study brother and/or sister were not association with nutritional status ( $P=0.187$ ). The mean age of respondent in this study was 15.37 years. The results of this study, age was not related with nutritional status

( $P=0.963$ ). The proportions of male and female respondents were 55% and 45% respectively. This study did not find any significant relationship between gender and nutritional status of children ( $P=0.348$ ). The same study was done by Aghamolaei (2004) that showed no significant difference in nutritional status between male and female (Aghamolaei and Sobhani, 2004). About half of students (55%) were second born child, only 35 % was first born child, and 10% was the third or fourth born child. But birth order was significantly related with nutritional status ( $P=0.003$ ).

Among the respondents 35% took snacks more than two times per day. 65% took snacks one or two time per day. But in present study the relationship between snacking habit and nutritional status ( $P=0.000$ ). A study in Taheran found that some factors such as snack eating

habits and breakfast eating habits, in the school were also influence nutritional status. The habit of eating breakfast and stunting were related to educational performance of students. Therefore implementation of food intervention and nutritional education in community may be effective (Alavi et al., 2008). Knowledge level toward nutrition showed no significant relation with nutritional status ( $P=0.154$ ). Mii (2007) found that, more than half of students had poor level of knowledge (57.5%), and 30% had fair level and only 12.5% had good level of knowledge, this showed association between knowledge and nutritional status.

#### **Relationship between nutritional status and enabling factors**

More than half of the respondents (82.5%) lived with parents, 12.5% lived with relatives and 5% lived in hostel when discussing about accommodation type of students. We found a strong significant relation between nutritional status and student accommodation type ( $P=0.008$ ) at 5% level of significance. The caretakers were mostly parents (82.5%). Relative were also caretakers of few students (12.5%). The current study found significant relation between caretakers and nutritional status ( $P=0.007$ ) at 5% level of significance. Study in Nepal reported that the students who take care by parents was also significantly associated to nutritional status ( $P<0.05$ ). Feeding practices affect a child's nutritional status includes adaptation of feeding to the child's abilities responsiveness of the caregiver to the child and selection of an appropriate feeding context (Engle et al., 1999).

Concerning the parents occupations 50% of the father's occupation were business and 22.5% were farmer. Majority of the mother's occupation was housewife (97.5%). We found significance relation between nutritional status and fathers occupation ( $P=0.019$ ) but mother occupation was not associated with nutritional status ( $P=0.518$ ). Parents' education of the majority respondent was in the high school or college (father 63% and mother 47.5%). There was association between mother's education and nutritional status ( $P=0.007$ ). But fathers education had no association with nutritional status ( $P=0.371$ ). Moradi et al. (2003) reported that education of mothers concerning nutritional requirements of children make them possible to benefit a proper nutritional program. Study in Pakistan by Nabeela et al. (2005) found Prevalence of malnutrition was 42.3% among children of illiterate mothers as compare to 20% in those of literate mothers.

When discussing about earning person of the family most of the family had one earning person (87.5%) and 10% had two earning person in family. Earning person in family was significant with nutritional status ( $P=0.028$ ). Study in Pakistan by Nabeela et al. (2005) also found that children with BMI <5th percentile was 41% in lower class while in upper class it was 19.28%. In current study 75% households had less than five or five family members and 25% households had more

than five members. There was no association between family size and nutritional status ( $P=0.093$ ). A study by Smith and Haddad (2000) examined household size is related to the nutritional status of children. The results of this study found significant association between money for snacking and nutritional status ( $P=0.020$ ). Most of the students (52.5%) spent 11-20 for snacks per day.

#### **Conclusions**

Current study was performed to report on nutritional status and related factor among secondary school students. The problem of underweight found 42.5%, among them 25% was female and 17.5% was male. It found that among the students the problem of underweight was 45%, and overweight was 2.5% and healthy weight was 52.5%. In this study we found some independent variable as like birth order ( $P=0.003$ ), snacking habit ( $P=0.000$ ), taking care of respondents ( $P=0.007$ ), fathers' occupation ( $P=0.019$ ), mothers' education ( $P=0.007$ ), earning person of the family ( $P=0.028$ ) and money for snacking ( $P=0.020$ ) have significant correlation with nutritional status. Improvement in food production, effective economic changes, maternal education, and nutrition education program are few tools to support malnutrition eradication program.

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