Assessment of Knowledge Regarding Nutrition among Secondary School Students in the Northern Regions of Bangladesh

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ABSTRACT

Bangladesh, the rising rate of malnutrition among teenagers enrolled in school poses a serious risk to public health. Teenagers in school are a significant population that suffers from malnutrition. Accurate nutrition advice can improve their health, increase their understanding, and lessen the impact of malnutrition. The study aimed to assess knowledge level on nutrition among secondary school students in a selected school of Bogura town which is northern regions of Bangladesh. A cross-sectional study was conducted with secondary school students of a selected school at Bogura. Students of class VII to class X were included in the study. Sample size, in this study, was 222. Purposive sampling was done. Data, collected by a structured questionnaire, were analyzed using SPSS software version 22. Results were presented by frequency tables and graphs. Mean age of the respondents with standard deviation was 14.46 ± 1.3 years with a maximum value of 18 years and a minimum value of 12 years. Among them, 26.6% are in class VII, 27.5% are in class VIII, 26.1% are in class IX and 19.8% are in class X. Most of their fathers (63.5%) and mothers (64.4%) have an educational level of SSC or HSC. Among the respondents, 39.2% were found to have good knowledge,48.6% to have average knowledge and 12.2% to have poor knowledge regarding overall nutrition. About 61.9% of the respondents were found to have good knowledge, 30.1% to have average knowledge and 2.1% to have poor knowledge regarding nutrient content of different foods.

Keywords: Knowledge, Nutrition, Secondary School Students.

INTRODUCTION

The function of nutrients in the body's growth, development, and maintenance is its primary focus. The word ‘nutrition’ often corresponds with the word “food”. But in real sense the term Nutrition refers to the science of food and its relationship with health. It is mainly concerned with the function performed by the nutrients in the growth, development and maintenance of the body. “World Health Organization” describes Nutrition as “Nutrition is the intake of food, considered in relation to the body’s dietary needs.” Three fundamental pillars of development are education, health, and nutrition. (United Nations Food and Agriculture Organization, 2005). People who are healthy, fed, and educated are a nation's most valuable resource for attaining social and economic advancement. In actuality, nutrition plays a crucial role in both development and health. Stronger immune systems, a decreased risk of non-communicable diseases (including diabetes and cardiovascular disease), longer lifespans, and better health for mothers, babies, and children are all associated with better nutrition. Nutrition is the primary determinant of human health development. A good diet reduces the incidence of chronic diseases, promotes a healthy pregnancy, and aids in maintaining a healthy body weight. You Are What You Eat" refers to the idea that eating well is essential to maintaining excellent health and fitness. Those who eat well are more productive and healthier than those who don't. Our everyday lives are greatly impacted by our diet. Because each food or beverage contains a unique nutrition that is essential to our physical and mental development, they have an impact on our bodies and health. Our bodies require a specific amount of any given nutrient. Therefore, it is crucial to understand what foods we must eat, how much of each

meal we must eat, and what kind of nutrition each food has. The human body needs seven major types of nutrients to stay healthy: water, fiber, proteins, carbs, fats, vitamins, and minerals. While humans can survive with fewer micronutrients (vitamins and minerals), we require a lot of macronutrients. Every time we consume food or nourishing liquids, our body breaks down and absorbs the simple but necessary minerals, vitamins, proteins, fats, carbohydrates, and water. It then transforms these nutrients into energy and bloodstream that support the growth and well-being of our bodies. Processed, sugary, fatty, and salted foods are bad for the body, as we have seen. These foods deplete the body and impair its ability to function. The body, on the other hand, is fueled by eating fresh, whole-natural foods since they provide the energy the body needs, boost metabolism, address micronutrient deficiencies, avoid chronic diseases, and promote overall health and wellbeing. Adolescents grow quickly in many areas—physical, mental, and social. This influences their thoughts, feelings, decision-making, and interactions with the outside environment. This time frame is further defined by Patton and others (Patton G C, 2016) as early adolescence (ages 10–14), late adolescence (ages 15–19), youth (ages 15–24), and young adulthood (ages 20–24). [Bundy D A P, 2017] provides definitions for age groups and age-specific terms used in this volume. Nearly 1.8 billion people between the ages of 10 and 24 make up one-fourth of the world's population, and 89 percent of them reside in low- and middle-income (LMIC) nations.

Rationale of the study

One definition of nutrition knowledge is “awareness of nutrients and their relevance to health and well-being, ability to find reliable information about food and/or how foods fit into a balance diet” (Azevedo Perry et al., 2017; Edited by: François Mariotti). More specifically, Nutrition knowledge is characterized as a “scientific construct that nutrition educators have created to represent individual's cognitive processes related to information about food and nutrition” (Axelson & Brinberg, 1992, p. From: Appetite, 2018). Although nutritional status of children and adolescents is of great concern, various interventions and modifications aiming at promotion of healthy eating behaviors have limited impact due to insufficient understanding of dietary habits between different age groups and genders.

The importance of nutritional knowledge is that. Firstly, it helps individuals make informed choices about the types and amounts of food they consume, which can have a direct impact on their nutritional status and overall health. Secondly, having good nutritional knowledge can lead to improved dietary practices, as individuals are more likely to choose foods that provide balanced nutrition for their bodies. Additionally, nutritional knowledge is crucial for growth and development, especially in adolescents, as it helps them understand their optimal nutritional needs and improve their eating patterns. Furthermore, nutritional knowledge plays a role in shaping attitudes and practices towards nutrition, such as the preparation of balanced family meals. Overall, having adequate nutritional knowledge is essential for making healthy food choices, maintaining good health, and preventing nutritional problems.

Objectives

General objective: To assess knowledge regarding nutrition among the secondary school students enrolled in of Khatemon Adarsha High School, Bogura.

Specific objectives:

- To identify socio-demographic characteristics of the respondents.
- To assess overall knowledge regarding nutrition among the respondents.
- To assess of knowledge regarding types of nutrients present in different food.

METHODOLOGY

The study was a descriptive cross-sectional study. Sampling method adopted in this study was purposive sampling. In this study was conducted at secondary school students of selected High School (Khatemon

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Adarsha High School, Thengamara School, Bit High School, & Others) Bogura. A partially structured questionnaire was used as the research instrument. Two hundred Twenty-Two secondary school students from the Khatemon Adarsha High School, Thengamara School, Bit High School, & Others Bogura were interviewed using the questionnaire. A pilot survey (pre-testing) with the questionnaire was done with five students and with the findings the questionnaire was redeveloped. Then finally data collection was continued.

Inclusion and Exclusion criteria

Inclusion criteria:

- Students of High School, Bogura.
- Students of class VII to class X.
- Students who were found smart enough to provide correct data.

Exclusion criteria

- Students below class VII.
- Students who were sick, absent from school or not eager to participate in the study willingly.

Data analysis

Questionnaire responses from master sheet were converted into SPSS file and analyzed using SPSS software version 22 (IBM Corporation, New York, USA) and results were interpreted as needed.

Table 1 shows sociodemographic characteristics of the respondents with their families. Mean age of the respondents with standard deviation was 14.46 ± 1.3 years with a maximum value of 18 years and a minimum value of 12 years. 5.9% of the respondents are at the age of 12 years, 13.1% are at the age of 13 years, 36.9% are at the age of 14 years, 21.6% are at the age of 15 years, 15.3% are at the age of 16 years, 5.4% are at the age of 17 years and 1.8% are at the age of 18 years. Most of the students are 14 to 15 years old. Regarding class, the students are enrolled in, 26.6% are in class VII, 27.5% are in class VIII, 26.1% are in class IX and 19.8% are in class X.By occupation, 14.4% fathers of the respondents are Farmers, 29.7% fathers are Businessman, 23.9% fathers are employed in job and 32.0% fathers have occupations other than these. By residence, 92.8% are from Rural area, 4.5% are from Sub-urban area and 2.7% are from Urban area.

Table 1**:** Distribution of the respondents by some of their socio-demographic characteristics (n=222).

Socio Demographic Characteristics	**Respondents**	
	Frequency (*f*)	**Percentage**
Respondents by age		
12 years	13	5.9
13 years	29	13.1
14 years	82	36.9
15 years	48	21.6
16 years	34	15.3
17 years	12	5.4
18 years	04	1.8
Mean age = 14.5 ± 1.3 years; Minimum = 12 years; Maximum = 18 years		

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Respondents by class		
Class VII	59	26.6
Class VIII	61	27.5
Class IX	58	26.1
Class X	44	19.8
Respondents by father's occupation		
Farmer	32	14.4
Businessman	66	29.7
Employee	53	23.9
Others	71	32.0
Respondents by residence		
Rural	206	92.8
Sub-urban	10	4.5
Urban	06	2.7

Figure 1 shows educational status of fathers of the respondent's. 15.3% have No formal education, 5.9% have primary education (incomplete), 6.3% have primary education (completed), 2.7% read only up to class VIII, 63.5% completed either SSC or HSC and 6.3% are graduate or more than that.

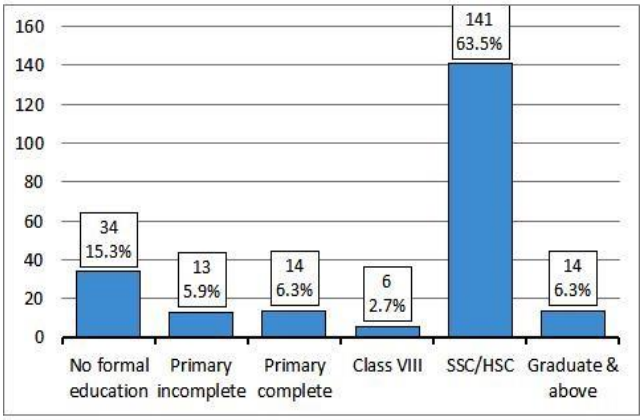

Figure 1: Respondents by educational status of their father (n=222).

Figure 2 shows educational status of mothers of the respondent's. 11.7% have No formal education, 4.5% have primary education (incomplete), 13.1% have primary education (completed), 3.6% read only up to class VIII, 64.4% completed either SSC or HSC and 2.7% are graduate or more than that.

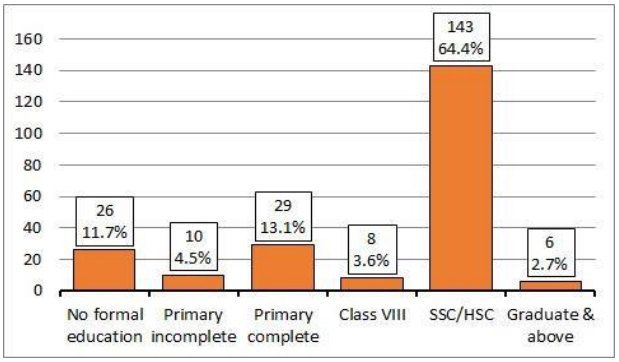

Figure 2: Respondents by educational status of their mother (n=222).

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Table 2: presents 25 statements (with percent of study subjects responding to each response) about nutrition, against which responses of the participants were obtained. All these statements with their responses were analyzed by scoring method to assess knowledge level of the participants regarding nutrition. Some of the statements were true and some were false. The responses, against the statements, were "Disagree", "Neutral" and "Agree" from Likert scale. Scores allotted for "Disagree", "Neutral" and "Agree" responses were 1, 2 and 3 respectively. This was the scoring system for true statements. But for false statements, the scoring system was reversed. It means, for false statements scores allotted for "Disagree", "Neutral" and "Agree" responses were 3, 2 and 1 respectively. Among the statements, statement number 4, 8, 9, 10, 12, 13, 15, 16, 17, 21, 23, 25 are false and for these false statements scoring was such that responding to any of these statements as "Disagree" got 3 marks, responding as "Neutral" got 2 mark and responding as "Agree" got 1 mark. Rest of the statements were true and for those scoring was such that responding to any of these statements as "Disagree" got 1 mark, responding as "Neutral" got 2 mark and responding as "Agree" got 3 mark. In this way, scoring was completed and finally scores were categorized. Maximum possible score for these 25 statements was '75' with a minimum score of '25'. Score for this part of the questionnaire was calculated for each respondent. Minimum score obtained by the respondents were 42 and maximum score was 69. Mean±SD of obtained score was 58.1±6.0.The three categories of the scores were 41 to 50, 51 to 60 and ≥61. Respondents, who obtained

Table 2: Responses of the participants against some nutrition knowledge related questions (n=222).

S.N	Statements	Disagree (1)	Neutral (2)	Agree (3)
01	There are six types of nutrients.	03 (1.4%)	0 (0.0%)	219 (98.6%)
02	Carbohydrates are main source of energy.	86 (38.7%)	0 (0.0%)	136 (61.3%)
03	In balanced diet 60-70% calorie comes from CHO.	111 (50.0%)	01(0.5%)	110 (49.5%)
04	Meat and Fish are fatty type of food.	55 (24.8%)	2 (0.9%)	165 (74.3%)
05	Fat is indispensable for forming animal body.	66 (29.7%)	7 (3.2%)	149 (67.1%)
06	It is wise to keep colored fruits and vegetables in every day's diet.	25 (11.3%)	0 (0.0%)	197 (88.7%)
07	Protein is very essential for body growth and development	33 (14.9%)	4 (1.8%)	185 (83.3%)
08	Vitamins are of eight types	135 (60.8%)	4 (1.8%)	83 (37.4%)
09	Vitamin A deficiency leads to Rickets	104 (46.8%)	10 (4.5%)	108 (48.7%)
10	Protein is essential for hardening bones and teeth	83 (37.4%)	15 (6.7%)	124 (55.9%)
11	Iron rich food increases blood (hemoglobin) formation	50 (22.5%)	6 (2.7%)	166 (74.8%)
12	Every day you should eat 2-3 eggs	124 (55.9%)	8 (3.6%)	90 (40.5%)
13	For human body cold drinks are more beneficial than water	185 (83.3%)	2 (.9%)	35 (15.8%)
14	Deficiency of vitamin C leads to Scurvy	79 (35.6%)	2 (0.9%)	141 (63.9%)
15	An adult need to consume 3-4 liters of water daily	111 (50.0%)	4 (1.8%)	107 (48.2%)
16	Fats used in fast food are beneficial for our body	155 (69.8%)	0 (0.0%)	67 (30.2%)
17	Fresh fruits & vegetables contain good amount of Vitamin D	109 (49.1%)	4 (1.8%)	109 (49.1%)
18	Vitamin B2 (Riboflavin) deficiency leads to ulcer of mouth and lips	71 (32.0%)	4 (1.8%)	147 (66.2%)
19	Vitamin A maintains healthy skin	60 (27.0%)	0 (0.0%)	162 (73.0%)

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20	Vegetables and drinking water provides minerals	80 (36.0%)	1 (0.5%)	141 (63.5%)
21	50% of our body weight is due to water	125 (56.3%)	2 (0.9%)	95 (42.8%)
22	Protein + Calcium rich food also have phosphorus	60 (27.0%)	1 (0.5%)	161 (72.5%)
23	CHO foods have low nutritive value than protein food	154 (69.4%)	0 (0.0%)	68 (30.6%)
24	Minerals and water helps in fighting diseases	76 (34.2%)	2 (0.9%)	144 (64.9%)
25	Fish and meat are fiber rich food	124 (55.9%)	2 (0.9%)	96 (43.2%)
	Average percent of respondents	40.8%	1.5%	57.7%
	Mean±SD score = 58.1±6.0 **Minimum score** = 42, **Maximum Score** = 69 **Range of Score** = 25 to 75			

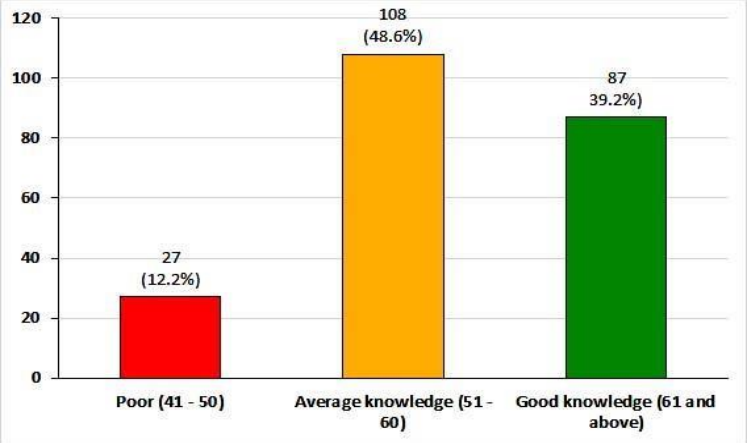

Figure 3: Respondents by knowledge level assessed by knowledge score of 25 statements (n=222). (Mean Score: 58.1±6.0; Minimum score: 42; Maximum score: 69

Figure 3 shows respondents by different level of knowledge regarding nutrition. 39.2% of the respondents were found to have **Good nutrition knowledge**, 48.6% to have **Average nutrition knowledge** and 12.2% to have **Poor nutrition knowledge**.

DISCUSSION

Food is essential for ensuring that adolescents and students are healthy enough to go to school every day and for preparing them for learning. Brain growth, memory and cognitive function, energy, focus, and attention are all impacted by nutrition, and these factors are all important for learning and remembering knowledge. Teaching NE to children at all ages in schools helps them develop important life skills and good habits that will last a lifetime. Early adoption of good habits increases a child's likelihood of being healthy, remaining healthy, and performing well in school. Compared to adults, the importance of dietary consumption is more noticeable and significant during childhood and adolescence. Children's health is particularly impacted by their nutritional intake because of their rapid physical, mental, and cognitive development.

Additionally, it has a lasting impact on overall health by influencing children's eating habits for the rest of their lives [Coulson NS, 1998; Story M, 2002]. Obesity and dietary habits are linked to a number of short-term issues as well as significant long-term repercussions, such as diabetes, high blood pressure, stroke, cancer, dental cavities, asthma, and other mental health conditions including depression. Furthermore, it has long-term effects on general health status through formation of life-long eating behaviors in children [Coulson NS, 1998; Story M, 2002]. Food intake patterns and overweight are associated with different immediate complications and major long-term consequences including cardiovascular diseases, diabetes, high blood pressure, stroke, cancer, dental caries, asthma, and some other psychological disorders like depression. An essential component

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of each person's knowledge set is learning about nutrition. It assists us in making knowledgeable food choices, which may result in better health consequences. A healthy diet can promote mental well-being, increase vitality, prevent chronic illnesses, and improve quality of life in general. This study determines the level of knowledge among secondary school students in a selected school of Bogura sub-urban area. Mean age of the respondent school students was 14.46 ± 1.3 years with a maximum value of 18 years and a minimum value of 12 years. Students were selected according to inclusion criteria from class seven to class ten. Most of them were from class seven to class nine. Parents of the students were mostly businessmen, or in service or in some other professions, by occupation. Few of them were farmers. Almost all of these students are from rural areas with rest few from sub-urban or urban areas. Bangladesh being Muslim majority country, almost all the students are Muslim with few Hindus. Educational status of fathers of those respondent students are such that, majority of them have completed either SSC or HSC course. Likewise, most of the mothers of the respondent students also completed either SSC or HSC course. Educational status of mothers and fathers positively contribute to a child's nutrition. However, mothers' education is considered more significant, especially in the long run [Sarwar A, 2024]. R.V. Bhavani, the project director at the B.V. Rao Center for Sustainable Food Security, highlighted the increasing presence of junk food in the market, particularly among urban school children and the middle class. While malnutrition and hunger remain significant issues, concerns about obesity and related health problems are also emerging. Additionally, unhealthy food options are spreading rapidly to rural areas, making it essential to raise awareness about healthy eating habits to prevent future health crises (Abler, 2008). Adolescents, in particular, have greater exposure to various media, which further influences their food choices (Wakefield et al., 2003).. Exposure to media is expected to increase knowledge about nutrition.

Knowledge of the Respondent secondary school students were assessed by asking them different nutrition related questions and analyzing their responses. The statements in these questions were prepared from the nutrition part of their school textbooks. The questions were divided into two groups. A set of 25 questions were related to overall nutrition. Another set of 10 questions were related to nutrient value of different types of foods. All together there were 35 questions. The responses against those questions were analyzed by scoring method to assess knowledge level of the participants regarding nutrition. Scoring was done on two fields. One was regarding knowledge about overall nutrition and the second was knowledge regarding nutrient content of different foods. Twenty-five statements reflected knowledge about overall nutrition whereas ten questions reflected knowledge regarding nutrient content of different foods. Scoring was done for assessment of knowledge. For 25 questions, a Likert scale was used with options of “Disagree”, “Neutral” and “Agree” response. The given score was 1 for “Disagree” response, 2 for “Neutral” response and 3 for “Agree” response. Twelve statements out of these 25 statements were false and therefore a reverse scoring was done for these 12 questions (i.e., the given score was 3 for “Disagree” response, 2 for “Neutral” response and 1 for “Agree” response against these 12 statements). Regarding knowledge about overall knowledge regarding nutrition, majority of the respondents were found to have average knowledge, a good number were found to have good knowledge but only few were found to have poor knowledge. Regarding knowledge about nutrient content of different foods, almost all of the respondents were found to have good knowledge with some having average knowledge and only few having poor knowledge.

CONCLUSION

Healthy eating learning opportunities includes nutrition education and other activities integrated into the school day that can give children knowledge and skills to help choose and consume healthy foods and beverages (CDC, 2011). Nutrition education is a vital part of a comprehensive health education program and empowers children with knowledge and skills to make healthy food and beverage choices (Price C, 2017; Meiklejohn S, 2016; Silveira JA, 2013).This study was conducted to assess knowledge of the secondary school students of a selected school of Bogura town, regarding nutrition. Findings in this study reveal that, regarding knowledge about overall knowledge regarding nutrition, majority of the respondents were found to have average knowledge, a good number were found to have good knowledge but only few were found to have poor knowledge. Regarding knowledge about nutrient content of different foods, almost all of the respondents were found to have good knowledge with some having average knowledge and only few having poor knowledge.

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