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Study on Dietary Pattern and Nutritional Status of School Going Children in Navaron, Jashore, Bangladesh

Animesh Sarkar[1,*], Yasir Arafat[1], Mahabub Alam[1], Jayanto Kumar Sarkar[2]

[1]Department of Food Engineering and Tea Technology, Shahjalal University of Science and Technology, Sylhet 3114, Bangladesh
[2]Department of Environmental Science and Technology, Saitama University, 255 Shimo-okubo, Sakura-ku, Saitama 338-8570, Japan
*Corresponding author: animeshsarkarbau@gmail.com, animesh-fet@sust.edu

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Abstract This study estimated nutritional status and dietary intake levels as well as relevant knowledge about the School Children of Navaron, Jashore, Bangladesh using questionnaire survey data. In terms of physical and mental development, nutritional status directly affects the growth of children. In urban slums, underprivileged children fall behind the minimum amount of food and nutrition that is likely to lead to their poor development. This research is a cross-sectional analysis of 80 school-going children who are village residents in various parts of Navaron, Jashore. A stratified random cluster sampling has been used in 5 schools to select 53 boys and 27 girls aged 10-18. Information was obtained from the students being questioned directly. Among the children surveyed, we found that the majority of fathers of the respondents were farmers (33.75 %) and their monthly income was around 10,000 T.K. The child received three meals per day in 90 percent of the cases, albeit inadequately. It was found that 56.25 % of the respondent drink water from deep tube well and 42.50 % from Tube well, 66.25 % take nutritional supplements and their type of supplement is vitamins/minerals (61.25 %), about 31.25% kids take fast foods few days a week and most of the children do not participate in physical activity, of about 81.25 %. We found kids from low-income and less-educated families had a dietary pattern which is poor in terms of balanced diet. These urban slum school children's diets were inadequate for macronutrients and micronutrients, which poses a threat to significant nutritional and health consequences. It is important to emphasize the need to develop healthy food supply and habits.

Keywords: *children, nutritional status, food consumption, malnutrition, underdevelopment*

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1. Introduction

In Bangladesh, health and nutritional issues are widespread and persistent as a result of poor dietary intake. Nutritional health issue, like other developing countries, is a very serious public health problem in Bangladesh [1]. This is particularly true and concerns the children with great apprehension. Malnutrition measured as low anthropometric status means an imbalance between consumption and the need for optimal growth and function of the body [2].

Such long-term disparity results in chronic malnutrition or undernutrition, whereas acute malnutrition or waste represents a recent acute imbalance [2]. Chronic malnutrition is often associated with insufficiency in the diet, frequent infections, or both. Children are also commonly associated with undernutrition with chronic disease and consequently these lead to disturbed children's growth adversely affecting their future life mental capacity, learning ability, and productivity [3]. The campaign for child survival frequently recognizes the importance of these two types of malnutrition, with less attention being paid to acute malnutrition, an extremely common condition among pre-school children in developing countries and associated with high mortality and morbidity levels [4].

This is not only a major health issue, but also a significant impediment to national socio-economic development. Increasing evidence indicates that for many chronic diseases such as obesity, coronary heart disease, hypertension, diabetes mellitus, and certain types of cancer, diet and lifestyle in childhood and adolescence have a potential lifelong impact [5,6]. Due to the widespread prevalence of malnutrition among children living in developing countries, additional feeding programs have become a widely accepted strategy for health promotion and disease prevention [7]. Conclusive reviews of food supplementation programs in developing countries are usually not available. Most of these systems have been introduced without taking into account the criteria that must be met in order to draw a reliable conclusion from the analysis of the program.

The aim of this study is to evaluate the dietary intake and dietary patterns of a sample of Navaron School Children in Jashore, Bangladesh. The Objectives of this present work were to assess school children's nutritional

status, food consumption, sanitation, and other behaviors, and to examine factors that could affect children's dietary patterns and food intake.

2. Materials and Methodology

2.1. Sample

Bangladesh's population in 2019 was almost 180 million, making it one of the world's most densely populated countries. Bangladesh is known as one of the world's economically disadvantaged nations. Jashore is one of Bangladesh's populated cities. In Navaron, about 30,000 people live, most of them are peasants. The development of the study was a cross-sectional retrospective survey. Kids going to school were chosen for the study. Ten schools from ten different places with 80 students from different age groups were selected randomly for this reason. In the majority of cases, the guardians of the students were interviewed together with the students.

2.2. Nutritional Status

A questionnaire that requested socioeconomic status data, personal characteristics, dietary intake, health status, and morbidity status were developed and pre-tested prior to completion. Doctors used a checklist of health information. Moms were asked in the study about their children's immunization status, morbidity in the last month, presence of any illness, etc. Physicians have assessed children's hygiene status and clinical signs of malnutrition. Data on family size, composition, housing, sanitation and drinking water conditions has been reported. The schools were visited on prefixed dates to collect data. The day before the interview was conducted, the selected students were informed by the school administration. Informed consent to the involvement in the study was obtained from the parents.

2.3. Food Consumption of Selected Foods

Using the 72-hour dietary recall process, food consumption was assessed using school days only and thus diet was not reported at the weekend. To increase the accuracy of portion size estimates of consumed individual foods. We based on respondents' normal regular daily diet behaviors. Students were divided into four age groups: age group-1 (below 10), age group-2 (11-13), age group-3 (14-16) and age group-4 (16-up). Data was analyzed for simple frequency distribution of selected variables with univariate analysis. The normality of the data distribution was tested with the goodness of the fit test for each of the variables. The data were split into groups using the correct cut-off points. Quartile was measured for per capita monthly household income and average daily intake of energy by children.

2.4. Sanitation & Physical Activity Habits

To estimate the sanitation, physical activity habits, students were asked about the sanitation habits, number of hours spent watching television during a school day and a typical weekend day, and about the frequency of after school PA, such as running, jumping, jogging, bicycle riding, or playing soccer. Although, we acknowledge that a proportion of children walked to and from school, we did not determine it. Unfortunately, children have increasingly abandoned this habit due to security concerns in both urban and rural areas. TV viewing was calculated adding the total number of shows watched on a daily basis, as has been done in previous studies [8].

2.5. Statistical Analysis

Data were analyzed using SPSS software. Differences with p-values < 0.05 were considered statistically significant.

3. Results

The research included 80 school-going kids of Navaron, Jashore (Male: 53 and Female: 27). Majority of the respondents (65.00 %) were at the age group of 11 to 13. The father was the guardian of the family for the most of the cases and his occupation was farmer (33.75 %), private service (12.50 %), labor (15.00 %) and Govt. service (8.75 %). Their father's monthly income was below 10000 T.K. (43.75 % cases) and between 10000-30000 T.K. (48.75 % cases). From the study we found that most of the families were small family. About 63.75 % of the respondents had a family of 2-4 members and 45.00 % respondents had no siblings (Table 1).

Table 1. Demographic Characteristics of the Respondents

Characteristics	Respondents	
	Number	Percentage
Age (Years)		
Below 10	4	5.00
11 to 13	52	65.00
14 to 16	21	26.25
Above 16	3	3.75
Gender		
Male	53	66.25
Female	27	33.75
Occupation of the respondent's father		
Govt. Service	7	8.75
Private Service	10	12.50
Farmer	27	33.75
Labor	12	15.00
Others	24	30.00
Monthly income of respondent's father		
Below 10000	35	43.75
10000-30000	39	48.75
30000-50000	5	6.25
Above 50000	1	1.25
Family member		
2-4	51	63.75
4-6	29	36.25
Above 7	-	-
No. of Children excluding respondent		
0	36	45.00
1	38	47.50
2	6	7.50
3	-	-
Above 3	-	-

From the study, it was found that 56.25 % of the respondent drink water from deep tube well and 42.50 % from Tube well. Water purification is often required (58.75 % cases). 90 % of the children took three meals a

day. Our result showed that 66.25 % took nutritional supplements and their type of supplement was vitamins/minerals (61.25 %). They took fast food regularly and about 31.25% kids took it a few days a week and 21.25% took it once a day. We found that 60.00 % children always take salt while eating which is harmful. It was revealed that 71.25 % children do not take tea/coffee and 28.75 % children take tea (Table 2).

We found 70.00 % children used to eat home-made food. About 70 % parents sometimes discussed about the nutritional issues. Most of the respondent's main source of entertainment is television (83.75 % cases). Most of the children do not participate in physical activity, of about 81.25 %. Results also showed that due to poverty they do not have a healthy meal or even have to skip their meal on a daily basis (Table 3).

Table 2. Food Habit and Sanitation Practices of the Respondents

Characteristics	Respondents	
	Number	Percentage
Drinking water source		
Tube well	34	42.50
Pond	1	1.25
Streams	-	-
Deep Tube well	35	56.25
Do you purify water before drinking?		
Always	11	13.75
Often	47	58.75
Never	22	27.50
Food intake frequency per day		
1	2	2.50
2	6	7.50
3	72	90.00
4	-	-
5 and above	-	-
Do you take nutritional supplement?		
Yes	53	66.25
No	27	33.75
Which type of supplement?		
Vitamins/Minerals	49	61.25
Amino Acid	3	3.75
Herbs	1	1.25
How often do you take it (supplement)?		
2 times or more per day	-	-
Once daily	-	-
Every other day	1	1.25
2/3 times a week	2	2.50
How often do you eat fast foods?		
Never	-	-
1-3 times a month	11	13.75
Once a week	12	15.00
Few times a week	25	31.25
Once a day	17	21.25
Few times a day	15	18.75
How often do you drink milk?		
Never	-	-
1-3 times a month	26	32.50
Once a week	20	25.00
Few times a week	22	27.50
Once a day	10	12.50
Few times a day	2	2.50
Hand washing practice before food consumption?		
Yes	59	73.75
No	21	26.25
Washing hand with-		
Soap	17	21.25
Ash	2	2.50
Hand washing liquid soap	4	5.00
Only Water	3	3.75
Other	33	41.25
Smoking Practice (Teenage children)		
Yes	8	10
No	72	90
Do you take extra salt while eating?		
Always	48	60.00
Often	30	37.50
Never	2	2.50
Do you drink tea/ coffee?		
Yes	23	28.75
No	57	71.25

Table 3. Food, Nutritional Awareness and Physical Activities of the Respondents

Characteristics	Respondents	
	Number	Percentage
Daily food intake type		
Homemade	56	70.00
Restaurant	23	28.75
Both	1	1.25
Did your parents encourage you to eat fruits and vegetables?		
Often	19	23.75
Sometimes	58	72.50
Seldom	-	-
Never	3	3.75
Did your parents discuss about nutritional issues?		
Often	21	26.25
Sometimes	56	70.00
Seldom	-	-
Never	4	5.00
In School did your teacher discuss about nutrition issues?		
Often	33	41.25
Sometimes	44	55.00
Seldom	-	-
Never	2	2.50
Were there any days last month when your family didn't have enough food to eat or enough money to buy food?		
Yes	37	46.25
No	43	53.75
Do you take vitamin, mineral, herbal, or other dietary supplements?		
Yes	46	57.50
No	34	42.50
Does the family watch television during meals?		
Yes	67	83.75
No	13	16.25
Which of these meals or snacks did you eat yesterday?		
Breakfast	71	88.75
Lunch	68	85.00
Dinner	64	80.00
Morning snack	23	28.75
Afternoon snack	39	48.75
Evening snack	20	25.00
Do you skip breakfast 3 or more times a week?		
Yes	17	21.25
No	63	78.75
Do you skip lunch 3 or more times a week?		
Yes	9	11.25
No	71	88.75
Do you skip dinner 3 or more times a week?		
Yes	13	16.25
No	67	83.75
Did you participate in physical activity or exercise in the past week?		
Yes	15	18.75
No	65	81.25
If yes, on how many days and for how many minutes or hours per day?		
Less than 1	10	12.50
1-1.50	3	3.75
1.50-2	2	2.50
More than 2	-	-

4. Discussion

In some populations, patterns of food distribution within the family can lead to malnutrition [9,10]. Problems related to food intake and child health, especially nutritional issues, are described in Bangladesh as widespread and important public health concerns. The current study focused on the dietary patterns of Navaron school children in Jashore. We found that most of the respondent drink water from deep tube well which indicates that the impact of waterborne diseases is negligible in the area we surveyed. Deep tube well water is safe for drinking, that's why water purification is often required. Majority of them take three meals a day. The number of meals that children have had seems to have impacted family income. With an increase in income, we found the increase in number of meals a day. The number of family siblings and the number of family members are strongly correlated with the amount of meal. A significant number of children take supplements. Some supplements could help them to get enough essential nutrients. Especially in the fast food segment, the food-taking habit has changed quite rapidly among the school-going kids over the past decade. High salt intake is also found among the respondents which is a significant risk factor for increased blood pressure. Salt has been identified as an essential component of food with strong cultural and religious roots. People described both the health benefits and the risks associated with salt intake. Some of them take tea/coffee. Caffeine is the main ingredient of coffee and tea. It's a stimulant that works on the central nervous system. Kids who drink caffeine have problems with sleep. Caffeine induces an increase in blood pressure and causes anxiety in children, which in turn causes sleeping difficulties. It also leads to hyperactivity and attention problems.

All nutrition studies in rural Bangladesh reported difference in food consumption between boys and girls, caused by a male preference in food and health care intra-household allocation [11]. In Bangladeshi culture, it is important to note that the parents' education showed a connection to food intake patterns [12]. It is fascinating to see that economic status still plays an important role in dietary behavior patterns, even among these economically lowest members of society. It has also been shown, however, that dietary diversity is strongly associated with the socioeconomic status of the household and that ties have long been identified between socioeconomic status and child nutrition and health outcomes. Furthermore, the analysis of associations between dietary diversity and nutritional status is complicated by the fact that both are strongly associated with socio-economic factors in the household. Families with higher incomes and wealth appear to have more varied lifestyles, but are also likely to have better access to health care and better conditions for the community.

Homemade food is the best and healthy food for children to consume. Even though food is an integral part of medical care, nutrition education is not given in most households. Parents in middle-class families often promote consuming fruits and vegetables. The lack of a balanced diet habit is very surprising in our children's study population. The food habit was largely focused on a staple food product without any protein source or good nutritional source being included. Young children need a variety of foods to satisfy vital nutrient requirements, and it has long been known the importance of a diverse diet. Lack of diversity is a particularly serious problem in Bangladesh's poor populations as well as in the developing world, where diets are primarily based on starch-based staple foods and often include few or no animal products and only seasonal fruits and vegetables. The issue is particularly critical for infants and young children as they need energy-and nutrient-dense foods to grow and develop physically and mentally as well as to live a healthy life. Some studies have previously reported correlations between dietary diversity and the nutritional status of children.

5. Conclusion

Our study suggests that a variety of socioeconomic factors and family characteristics influence dietary patterns even under a very low social status. Our results provide some useful insights to help those who are interested to promote the vulnerable group's healthy eating behavior. In childhood, efforts to promote a healthy diet must begin.

Competing Interest

We declare that we have no competing interest.

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