

# Food security status of adolescent girls in selected urban slum

## Abstract

**Introduction:** Adolescent girls are the mothers of tomorrow and no edifice can be built on a foundation which is so weak.

**Objective:** The purpose of this study was to assess food security status of the adolescent girls.

**Methods:** A cross-sectional study was carried out among adolescent girls 10-19 years (n=150) in the selected slum areas in Dhaka city. Structured questionnaires were used to obtain information on socio-demographic characteristics, reproductive health status and health seeking behavior. Results: Based on this assessment, the majority of the girls (50%) were in the age group 10-13 years (early adolescence), while 30% were in the age group 14-16 years (middle adolescence) and 19.3% were in the age group 17-19 years (late adolescence). About 72.7% of the respondents were students and 24% of the adolescent girls worked in garments. The mean income of these slum households was approximately 19650 BDT per month. Regarding food security maximum percentage (48.7%) of families fall in acceptable low food consumption category and minimum percentage (2%) of families fall in poor food consumption category.

**Conclusion:** There was significant relationship between household total income and food consumption score. The relation was positive: as the total income of the household increased, the food security also increased. Here, total income shared 16.8% variation in food security.

**Keywords:** food security, adolescent girls, urban slum

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## Introduction

Adolescence is the transition period between childhood and adulthood. It is a period of life with specific health and developmental needs and rights to accommodate the different phases of development in the second decade of life, adolescence is often divided into early (10–13 years), middle (14–16 years) and late (17–19 years) adolescence.<sup>1</sup> They comprise 20% of the global population and about 80% of them live in developing countries like Bangladesh.<sup>2</sup> Several literature suggests that food security is a priority as malnutrition is a risk factor for morbidity and mortality, poor cognitive development and ultimately reduced productivity.<sup>3-5</sup> As for adolescent girls in the slum, they do not only face under nutrition problem, but they also have inadequate infrastructures problem that leads them not to have proper health care during illness. They are more susceptible to nutritional deficiency due to physical and social vulnerability. More than 60% of schoolgirls aged 10–16 years in Dhaka city consume protein, iron, and calcium less than 75% of the RDA for age.<sup>6</sup> The nutritional status of adolescent girls affects their health and condition in later life. The high prevalence of chronic energy and micronutrient deficiencies of today's adolescent girls is directly linked to the quality of the next generation. Without addressing these deficiencies, the vicious cycle of inter-generational under nutrition, chronic diseases, and poverty perpetuates.<sup>7</sup> Undernourished adolescent girls are likely to grow into undernourished young women who are more likely to give birth to undernourished babies.<sup>8</sup>

## Methodology

The study was a quantitative study and study design was cross-

sectional. The study was conducted among 150 adolescent girls in the selected urban area in Dhaka. The study was conducted in the slum area of mailbag, Santibag, and Mirpur from October 2017 to February 2018. For the study, a sample of 150 respondents was purposely selected to collect information on the proposed study. No incentive was provided. The respondents must be an adolescent girl age of 10-19 years, urban slum area and willing to participate in the study were included and those not willing to participate in the study, refusal from the family and demand money to participate were excluded. The purpose and nature of the study were explained to each participant and after getting the verbal consent, they were included in the study. The selected 150 girls were interviewed by pretested questionnaire. A standard questionnaire was developed to obtain the relevant information. Different types of variables were taken to see the association by using statistics. Statistical package for social sciences (SPSS) version 20 was used to analyze data. Descriptive as well as inferential statistics (co-relation) were used. Ethical guidelines of Declaration of Helsinki IV (2001) were followed throughout the study. The questionnaire was designed considering the privacy of the subject. The subject's personal information was kept confidential. Food security exists when all people at all times have both physical and economic access to sufficient food to meet their dietary needs for a productive and healthy life.<sup>9</sup> Food security is built on four pillars:

- i. Food availability: sufficient quantities of food available on a consistent basis.
- ii. Food access: having sufficient resources to obtain appropriate foods for a nutritious diet.
- iii. Food utilization: appropriate use based on knowledge of basic nutrition and care, as well as adequate water and sanitation.

iv. Stability: Food stability refers to the ability to obtain food over time. Food insecurity can be transitory, seasonal, or chronic.

Food consumption score is a proxy measure to access food security. The frequency of consumption of food items was measured using the food consumption score (FCS) established by WFP.<sup>10</sup> FCS is a well-defined indicator and its cut-offs are standardized and have been used across regions and livelihood groups. It is a composite score based on dietary diversity, food frequency and relative nutritional importance of different food groups. The respondent was asked about frequency of consumption of different food items over a recall period of last seven days. Food items were grouped into 9 standard food groups' whic a maximum value of 7 days in a week. The consumption frequency of each food group was multiplied by an assigned weight which is based on its nutrient content. After that, the values were summed to get the total food consumption score. Then a comment was made depending on the typical threshold.<sup>11</sup> The formula for calculating FCS-

$$FCS = a_{Staple} \times X_{Staple} + a_{pulse} \times X_{pulse} + a_{vegetable} \times X_{vegetable} + a_{fruit} \times X_{fruit} + a_{Meat \& fish} \times X_{Meat \& fish} + a_{Dairy} \times X_{dairy} + a_{Sugar} \times X_{Sugar} + a_{oil} \times X_{oil} + a_{condiments} \times X_{condiments}$$

Where,

FCS = Food consumption score

a1 = weight of each food group

x1 = frequency of food consumption (no of days for which each group was consumed during the past 7 days)

Following the FCS outlines, food consumption score for each of the household was calculated. The equation resulted score was used to categorize the household into poor consumption (0-28), borderline consumption (29-42), acceptable low food consumption (43-52) and acceptable high food consumption (>52). This categorization was done for Bangladesh, which considered the importance of oil and fish in the diet of Bangladeshi population.<sup>12</sup> Individual dietary diversity scores aim to reflect nutrient adequacy. Studies in different age groups have shown that an increase in individual dietary diversity score is related to the increased nutrient adequacy of the diet. Dietary diversity scores have been validated for several age/sex groups as proxy measures for macro and micronutrient adequacy of the diet. Scores have been positively correlated with adequate micronutrient density of complementary foods for infants and young children and macronutrient and micronutrient adequacy of the diet for non-breast-fed children, adolescents and adults. Some of these validation studies refer to only one country while others have attempted to validate dietary diversity scores for several countries.<sup>13</sup> The dietary diversity questionnaire can be used to collect information either at the individual level or household level. The decision on which level to collect information depends in part on the purpose and objectives of the survey. If the assessment of the nutrient adequacy of the diet is of primary concern, it is best to collect information at the level of the individual level. The individual dietary diversity score includes a small number of food groups, a great deal more detail that is eventually combined into 9 food groups. These groups are:

- I. Starchy staple,
- II. Dark green leafy vegetable,
- III. Other vitamin A rich fruits and vegetable,
- IV. Other fruits and vegetable,

- V. Organ meat,
- VI. Meat and fish,
- VII. Eggs,
- VIII. Legumes, nuts, and seeds,
- IX. Milk and milk products.

The tabulation of the individual dietary diversity is relatively simple. First, the individual dietary diversity score is calculated for each adolescent girl. The value of this variable will range from 0 to 9. To score of the individual dietary diversity score, the 9 food groups in the dietary diversity questionnaire are combined. The score for these combined food groups is either 1 or 0. Then the score can be divided into 3 groups:<sup>11</sup>

- a) Lowest dietary diversity (≤ 3 food groups).
- b) Medium dietary diversity (4 and 5 food groups).
- c) High dietary diversity (≥ 6 food groups).

## Results

Table 1 shows the number of adolescent girls aged between 10 to 19 years. About 50% were aged between 10-13 years, 30.7% were aged between 14-16 years and 19.3 % were aged between 17-19 years. Figure 1 presents that about 22.7% of the girls passed the classes less than class 3, 42% of the girls passed the classes 3 to 5, 16% of the girls passed the classes 6 to 8, 12.7% of the girls passed classes 8 to 10 and 6.7% girls passed SSC. Figure 2 presents the findings related to the occupation of the respondents. Majority of the respondents (72.7%) were students. 24% of the girls were garments workers and only 3.3% of the girls worked in others' homes. Figure 3 shows that about 31.3% of the families earned between 17000-25000 taka per month. 26.7% of the families earned less than 1400 taka, 26.7% families earned between 14000-17000 taka and only 18% families earned more than 25000 taka. Table 2 shows that maximum percentage (48.7%) of families fall in acceptable low food consumption category and minimum percentage (2%) of families fall in poor food consumption category. (Figure 4) About 61.3% of the adolescent consumed medium dietary diversified food. 30% of the respondent consumed lowest dietary diversified food where 8.7% girls consumed highly diversified food. Table 3 shows there was a significant relationship between household total income and food consumption score. The relation was positive: as the total income of the household increased, the food security also increased. Here, total income shared 16.8% variation in food security. (Table 4) From this table, it is clear that there was a positive relation between FCS and individual dietary diversity. But this relationship is not significant.

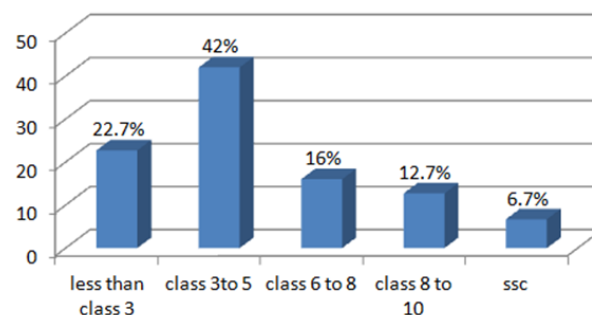


Figure 1 Distribution of educational status of the respondents (n=150).

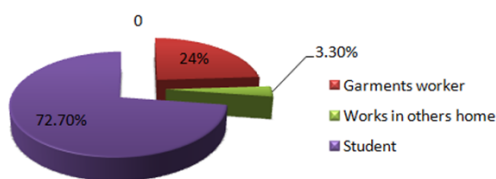


Figure 2 Distribution of occupation of the respondents (n=150).

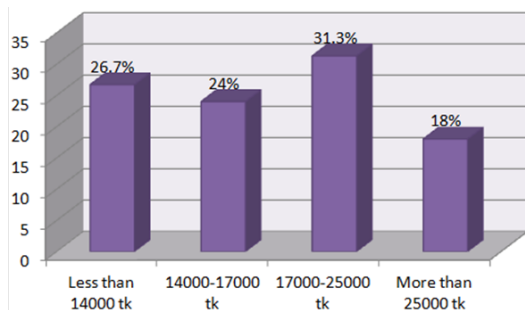


Figure 3 Total monthly income of the families of the respondents (n=150).

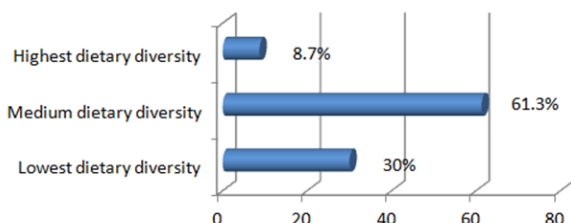


Figure 4 Dietary diversity score of the adolescent girls (n=150).

Table 1 Weight of different food groups used in the construction of FCS10

Food item	Food groups	Food weight
Cereals (bread, rice, maize, barley) and tubers (potatoes, sweet potatoes)	Staple	2
Pulses and nuts (beans, lentils, peas, peanuts, etc.)	Pulse	3
Vegetables	Vegetables	1
Fruits	Fruits	1
Beef, goat, poultry, pork, eggs, and fish	Meat & fish	4
Milk, yogurt and other dairy	Dairy	4
Sugar and other product	Sugar	0.5
Oil, fat, and butter	oil	0.5
Condiments, spices	condiments	0

Table 2 Distribution of the adolescent girls aged between 10 to 19 years (n=150)

Age (years)	Frequency	Percentage
Early adolescence (10–13 years)	75	50.0
Middle adolescence (14–16 years)	46	30.7
Late adolescence (17–19 years)	29	19.3
Total	150	100.0

Table 3 Household food security status (n=150)

Consumption status	Frequency	Percentage
Poor food consumption	3	2
Borderline food consumption	32	21.3
Acceptable low food consumption	73	48.7
Acceptable high food consumption	42	28
Total	150	100

Table 4 Relationship between household total income and food security (n=150)

Correlations			
		Total income	FCS
Total income	Pearson Correlation	1	.167*
	Sig. (2-tailed)		0.41
	N	150	150
FCS	Pearson Correlation	.167*	1
	Sig. (2-tailed)	0.41	
	N	150	150

\*.Correlation is significant at the 0.05 level (2-tailed).

Table 5 Relationship food security and individual dietary diversity (n=150)

Correlations			
		FCS	IDD
FCS	Pearson Correlation	1	0.22
	Sig. (2-tailed)		0.787
	N	150	148
IDD	Pearson Correlation	0.22	1
	Sig. (2-tailed)	0.787	
	N	148	148

## Discussion

In order to have a better-earning opportunity poor family from rural areas of our country migrate to cities and begin to live in slum areas. In a tiny period, these poor rural people become accustomed to living in such places and make temporary domicile there. As income earning opportunity is very limited in rural areas, growing number of rural people have migrated and settled temporarily in urban slums in recent years. The slum areas are mostly located by the side of roads and railways, in government khas (free) land and even on platforms erected on water bodies. Adolescence, a period of transition between childhood and adulthood, occupies a crucial position in the life of human beings. The poor nutritional status of adolescent girls has important implications in terms of physical work capacity and adverse reproductive outcomes.<sup>14</sup> Adolescents have specific health and development needs, and many face challenges that hinder their well-being. The findings of this study are kind of similar to some of the previous studies. In this study, the majority of the girls (50%) were in age group 10-13 years (early adolescence), while 30.7% were in age group 14-16 years (middle adolescence) and 19.3% were in the age group 17-19 years (late adolescence). About 24% of the adolescent girls were garments worker. The educational status of the girls was quite satisfactory as the majority of the girls (72.7%) were students. 18% of the family had monthly income more than 25000 takas and 26.7% of the family had monthly income less

than 14000 takas. Another study found that 51% of the household of the adolescent had monthly family income more than 20,000 takas and 11.4% had less than 10,000 takas.<sup>15</sup> Food security was in lower acceptable range for most of the households (48.7%). About 61.3% of the adolescence girls consumed four to five varieties of food daily. 30% of the girls consume less than 3 food items per day where 8% of the girls consume more than 6 food items per day. The mean dietary diversity score of the adolescent girls was four. A positive relation between household income and food security was found. When the income increased, the household consumed more food. As a result, their food securities become improved. Again a positive relation between food security and individual dietary diversity; individual dietary diversity was also found. In slum areas, due to poverty, these girls do not get properly balanced diet and become more at risk of developing life threatening diseases. Another reason for consuming a limited number of food is price hike of essential commodities. As a result, they have to eat same types of foods in their day to day life. Food consumption behavior, nutritional status, and dietary diversity are affected by socio-cultural factors. Poverty, gender, age, geographical location and cultural practices are important factors that affect food consumption pattern and dietary diversity.<sup>16</sup> Food directly influences food consumption due to lack of access to resources, knowledge, and market. Gender disparities in food distribution can cause malnutrition, especially for adolescent girls. Lack of income is the principal driver of low food consumption and malnutrition for about 40% of the Bangladeshi who live under the poverty line.<sup>17</sup> Households most vulnerable to food insecurity include those that lack productive assets and depend on inconsistent sources of daily wage labor. Within households, adolescent girls, children, female members and elderly members face relatively high nutritional risks. The human body requirement is the amount of dietary energy needed to maintain health, growth and an appropriate level of physical activity. A study, conducted in 2008, showed that the mean total food intake of all age and sex of average Bangladeshi population is 681 grams. The energy that an individual can derive from this food was 1894. Of the total energy intake, 76% comes from cereal, 17% from non-cereal plant sources and 6% from animal sources. Considering the per capita per day energy requirement (2187 kcal) and intake (1894 kcal), there is a mean gap of the energy of 293 kcal per person. Consumption pattern shows that rice is the dominant energy source, which may lead to malnutrition.<sup>18</sup> Studies have found dietary diversity to be a proxy indicator for nutritional status. Dietary diversity could be affected by intra-household food distribution. Different studies quantify that 1% increase in dietary diversity is associated with 1% rise in per capita consumption.<sup>13</sup> Dietary diversity (DD) has long been recognized by nutritionists as a key element of high-quality diets.<sup>19</sup>

## Conclusion

This study concluded that nearly half of the families fall in acceptable low food consumption category. There was significant positive relationship between household total income and food consumption score i.e. as the total income of the household increased, the food security also increased.

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None.

## Conflict of interest

The author has no conflicts of interests in this work.

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