

# Exploration of Eating Behaviours among Adolescent Girls from Two Selected Districts of Bangladesh

Fahmida Akter | Sabuj Kanti Mistry  
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Umme Salma Mukta  
Mahfuzar Rahman

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## ACRONYMS

ADP	Adolescent Development Programme
BBS	Bangladesh Bureau of Statistics
BEP	BRAC Education Programme
BDHS	Bangladesh Demographic and Health Survey
BDT	Bangladeshi Taka
CDC	The Centers for Disease Control and Prevention
DD	Dietary Diversity
DDS	Dietary Diversity Score
DGLV	Dark Green Leafy Vegetables
ERC	Ethical Review Committee
FANTA	Food and Nutrition Technical Assistance
FAO	Food and Agriculture Organization
FGD	Focus Group Discussion
HDDS	Household Dietary Diversity Score
IDI	In-Depth Interview
KII	Key Informant Interview
LMICs	The Low- and Middle Income Countries
RED	Research and Evaluation Division
SPSS	Statistical Package for the Social Sciences
UNICEF	United Nations Children's Fund
USD	United States Dollar
WDDS	Women Dietary Diversity Score
WFP	World Food Programme
WHO	World Health Organization
IPHN	Institute of Public Health Nutrition
HKI	Helen Keller International

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# EXECUTIVE SUMMARY

## BACKGROUND

A great majority of adolescent girls from low and middle income countries including Bangladesh are malnourished. Nearly one third (29%) of the adolescent girls of Bangladesh are stunted and the most immediate cause of which is inadequate dietary intake of nutrient rich foods and diseases. Eating patterns and behaviour is one of the important determinants of proper nutrition which widely varied among adolescent girls. However, very little studies has been conducted to date exploring the dietary pattern and food behaviour among them. Present formative research, thus was carried out to explore the eating patterns and related factors among adolescent girls, member of adolescent clubs in two selected districts in Bangladesh.

## METHODOLOGY

This formative research was cross sectional in nature and was conducted among adolescent girls from BRAC Adolescent Development Programme (ADP) clubs from Dhaka and Jamalpur districts. A mixed method study design was followed using both quantitative and qualitative approaches. Quantitative information was collected from 900 adolescent girls using a 7-day diary filled up by themselves, while focus group discussions (FGDs) and in-depth interviews (IDIs) was conducted to elaborate the findings from quantitative assessment.

## RESULTS

### Background characteristics

Average monthly household income was slightly higher in Dhaka compared to Jamalpur (BDT 14,424.4 vs. BDT 11,001.6 or USD<sup>1</sup>183.5 vs. USD140.0). Nearly half of the mothers

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<sup>1</sup> USD = 78.6 BDT (during data collection period)



of adolescent girl had no formal education in both areas (Dhaka: 49.9% and Jamalpur: 53.9%). In case of fathers, the percentages were 43.2 and 49.2 from Dhaka and Jamalpur respectively. The percentage of mothers who were engaged in any income generating activities were significantly ( $p < 0.001$ ) higher in Dhaka compared to those from Jamalpur (44% vs. 11%). Percentage of adolescent girls involved in different types of income generating activities is significantly higher in Jamalpur compared to the girls living in Dhaka (22.5% vs. 9.5%).

### **Knowledge and perception**

Adolescent girls from both areas had good understanding about the healthy diet. They were aware and possessed a comprehensive knowledge about the negative consequences of consuming unhealthy diets. Girls from Jamalpur districts were more aware and knowledgeable about diet and nutrition compared to their counterparts of Dhaka. About 63% girls from Dhaka and 58% girls from Jamalpur perceived their body weight as normal and this perception is more common in early adolescent girls (10-14 years old) compared to late adolescent girls (15-19 years old). To maintain perfect body weight, about 7% of adolescent girls thought that it had to do with diet control and for 10% it was about performing regular physical exercise whereas, 2.3% girls mentioned both.

### **Food preferences and purchase**

Food preferences by adolescent girls did not match with their knowledge about healthy diet. It varies between the two areas. Girls from Jamalpur found to have more healthy foods preferences compared to those of Dhaka. It was reported that taste of the foods were one of the most important determinant of food choice. Other factors of food choices, consumption as well as purchasing were appearance, cost and availability of the foods. Adolescent girls from Dhaka found to have purchased ready-to-eat foods more frequently than girls from Jamalpur. Average expenditure for this purpose was around BDT 65 (USD 0.8)/week and father (49%) was the main source of money followed by mothers (29%). This amount of money varied between the two areas [BDT 81.7 (USD 1.0) in Dhaka vs. BDT 47.2 (USD 0.6) in Jamalpur. Early adolescent girls spent more money [BDT 73.4 (USD 0.9)] compared to we adolescent girls [BDT 52.0 (USD 0.7)] for 10-14 years vs. BDT 52.0 (USD 0.7) for 15-19 years]. Most commonly purchased food items were biscuit, *Jhalmuri*, *fuchka*, *chanachur*, cake, ice-cream, candy/chocolate and peanuts etc. which were mostly carbohydrate based food items. The frequency of purchasing ready-to-eat food items varied significantly based on area and availability of different types of foods.

### **Consumption of foods from different food groups**

Daily consumption of foods from 4 or more food groups was higher among the girls from Jamalpur compared to Dhaka (84.4% vs. 64.1%) and do not varied significantly by age groups. Weekly consumption of meat, milk and milk product, and egg by the girls were lower than that of fish consumption. About 30.8% adolescent girls never consumed milk and milk products in a week while meat and egg consumption were among 17% and 11.3% respectively. Only 4% adolescent girls consumed internal organ for at least once in a week.

Consumption of vegetables and fruits were significantly lower among the adolescent girls in both areas. 45.7% girls never consumed vitamin A rich yellow-orange vegetables in a week and 20.8% girls never consumed fruits in a week. About 57% adolescent girls consumed soft drinks/commercially produced juices at least once in a week which was comparatively higher in Dhaka (63%) than Jamalpur (51%). Consumption of junk foods was more common among girls from Dhaka compared to girls living in Jamalpur.

### **Meal skipping**

Meal skipping among adolescent girls was more common in Dhaka compared to Jamalpur. Approximately half of the girls in Dhaka and 28.9% of girls in Jamalpur skipped any one of their meals (either breakfast or lunch or dinner) at least once in a week. The percentage of adolescent girls skipped breakfast at least once in a week was about seven times higher in Dhaka than Jamalpur (27.5% vs. 4.2%). Overall 24% of girls missed their lunch at least once in week. During dinner, 26.4% girls from Dhaka and 11.6% girls from Jamalpur skipped the meal. Most commonly cited reasons for meal skipping were 1) timing of school particularly early school time, 2) late wake up in the morning, 3) controlling body weight, 4) fight/turmoil with siblings or mothers, 5) less appetite and vomiting tendency in early morning etc. However, lack of fuel for cooking in morning and lack of time of mother to prepare foods for breakfast as well as for tiffin were mentioned as a cause of skipping meal in Dhaka only.

### **Dietary habit during menstruation**

Adolescent girls were not much aware about healthy eating during menstruation. Overall, 12% of adolescent girls refrained foods or ate less amount of foods than usual during menstruation. The percentage were higher among 15-19 years aged girls compared to early adolescent girls that is 10-14 years old (15% vs. 10%). Commonly refrained foods were mostly source of animal protein i.e., fish, meat, egg and also sour foods. Identified causes of food refraining were tastelessness, bad smell, lack of appetite, nausea and suggestion from elderly peoples.

### **Decision maker regarding adolescent's food**

From the childhood, mothers were found responsible for the dietary behaviour of adolescent girls (as mothers are mostly involved with menu planning and food preparation including cooking). While considering the food consumption decision of the adolescent girls, mothers were most influential followed by adolescent girls themselves.

### **Adolescents' perceptions on using the dietary diary**

Most of the respondents found keeping diary as an exciting, enjoyable as well as useful exercise.

## **Conclusion and recommendations**

### ***Nutrition counselling***

To effectively translate food related knowledge into practice, nutrition counselling is advocated to change food related behaviour, which in turn would result in improved practice in the long run.

### ***Context specific intervention***

Since dietary behaviour widely varies based on the context such as residence, availability of foods etc. any intervention on adolescent girls should take into account the context.

### ***Advocacy to regulate availability and marketing of unhealthy foods***

Present study identified that girls tend to eat only those ready to eat food items which were available at nearby shops. Thus, it is integral to have regulatory on the availability and marketing of unhealthy ready-to-eat foods through advocacy to policy makers and established coordination with relevant ministries and authorities.

### ***Establish evidence-based data on adolescent nutrition***

Information on dietary intake pattern as well as lifestyle of the adolescent girls is extremely scarce in Bangladesh. Therefore, to initiate any large scale interventions to address the malnutrition problem of this vulnerable group, more rigorous and nationally representative research on adolescent nutrition focusing on nutritional status (including micronutrient status), dietary intake, lifestyle and psychological or emotional issues is of utmost important.

## INTRODUCTION

### 1.1 BACKGROUND

Adolescence, defined by World Health Organization (WHO) as the segment of life between 10 and 19 years, accounting for 16.4% of the global population. A vast majority of adolescent (88%) lives in low and middle income countries (United Nations, Department of Economic and Social Affairs, Population Division, 2013). In Bangladesh, approximately 21% of the total population consists of adolescents (BBS and UNICEF Bangladesh 2014).

Adolescence is the second most critical phase of human development. During this transition period from childhood towards adulthood, every individual passes through tremendous biological, psychosocial and cognitive development process. Proper nutrition, therefore is one of the key requisites to attain optimum growth at this important age of life. Besides, as possible future parents, adolescents transfer their health potentials and risks to future generations (Temmerman *et al.* 2015).

A large number of adolescent girls of South Asian region suffer from chronic malnutrition and anemia, which adversely affects their health and development (WHO 2006). Malnutrition in adolescence often results in increased morbidity and mortality during pregnancy and child-birth, as well as increased risk of adverse birth outcomes like preterm births, low birth-weight babies, even stillbirths which contributes to the intergenerational cycle of malnutrition (WHO 2006).

Malnutrition, especially stunting/thinness and anemia among children, adolescents and women of reproductive age are still a major health concern in Bangladesh (icddr,b, UNICEF, GAIN and IPHN 2013; NIPORT, Mitra and Associates and ICF International 2013; Ahmed *et al.* 2000; Ahmed *et al.* 1998). Nationally, 29% of adolescent girls were short for their ages and notable difference was observed between urban and rural areas (urban 21% and rural 30%) in this regards (HKI and JPGSPH 2014).

The most immediate cause of malnutrition is inadequate dietary intake of nutrient rich foods and diseases. Besides under-nutrition, overweight and obesity is now becoming an emerging problem among rich and poor in Bangladesh (NIPORT, Mitra and Associates, and ORC Macro 2005; Mitra and Associates and Macro International 2009; NIPORT, Mitra and Associates, and ICF International 2013). Poor quality diets are associated with underweight/thinness, anemia and obesity among adolescent girls. A wide range of factors including affordability, dietary behaviour, nutritional knowledge and awareness influence the intake of nutritionally rich and diversified foods.

Eating patterns and behaviour is one of the important determinants of proper nutrition which is widely varied among adolescents. Healthy eating patterns established during adolescent period are particularly important as they are likely to track into adulthood (Mikkila *et al.* 2005). Eating behaviour in adolescence is influenced by multiple individual, social, physical, environmental and macro-system factors (Neumark-Sztainer *et al.* 1999; Story *et al.* 2002).

Like other South Asian countries, diets of Bangladeshi adolescent girls are poor in quantity and quality due to intra-household discrimination in food distribution and some other social and cultural malpractice and belief (Sen, 1988, Razzaque *et al.* 2011, Harris-Fry *et al.* 2017). If only one member of a household are to reduce consumption, it is virtually always an adult woman. When two members sacrifice, adults of both sexes are involved along with adolescent girls (HKI and JPGSPH 2014). On the other hand, consumption of junk foods which are energy dense but very poor in micronutrients content are increasing alarmingly among children and adolescents these days. Urbanisation and changes in lifestyle contribute in changed dietary habits and food choices which ultimately affect the healthy eating habits. Soft drinks, especially sugared beverages, are becoming more popular with adolescents which contributes to overweight and obesity and also poses the risk for type II diabetes (Malik *et al.* 2006 and Malik *et al.* 2010). Moreover, breakfast skipping, dieting and snacking are important health problems of adolescents specially girls worldwide (Shaw 1998; Cruz, 2000; Rolland- Cachera *et al.* 2000; Samuelson 2000).

As adolescents are the future generation of any country and their nutritional needs are critical for the well-being of society, adolescent girls should be the focus of a life cycle approach of nutritional interventions. More fruit and vegetable consumption can improve micronutrient levels among adolescents and may reduce risks for obesity, diabetes and some forms of cancer (FAO/WHO 2004). Adequate physical activity also play important role to promote adolescent health and development (Ekelund *et al.* 2012 and Smith *et al.* 2011). Promoting healthy and diversified diets containing nutrient dense foods, especially foods rich in bioavailable iron is one of the major recommended actions to improve adolescents' nutrition (Branca *et al.* 2015). Credible evidence on knowledge and understanding about food habits and eating behaviour of adolescents are important prerequisite for planning such interventions.

## 1.2 RATIONALE

Eating behaviour affects both over nutrition and undernutrition among adolescents. Though undernutrition was more prevalence in earlier period, researches on eating behaviour and its determinants were mainly focused on overweight and obesity among adolescent population in different countries (Mallick *et al.* 2014; Delliens *et al.* 2014; Birch *et al.* 1998; Hearty *et al.* 2013; Dixon *et al.* 2012; Northstone *et al.* 2014; Mullie *et al.* 2010; McNaughton, 2011; Vereecken *et al.* 2005; Shi *et al.* 2005). In Bangladesh, limited research has been done to date on eating behaviour focusing on adolescents.

Dietary pattern and factors influencing eating behaviours of adolescents need to be better understood to develop effective nutrition interventions to change eating behaviours. Previous researches to explore eating habit and behaviours among adolescents were mainly conducted were school or college centric (Ahmed *et al.* 1998). This type of study may not capture eating patterns and practices of adolescent girls who are school drop-out or have limited access to school and already involve in income earning activities. This study was conducted among adolescents who are members of adolescent clubs of BRAC Adolescent Development Programme (ADP). They were involved in formal or non-formal education mainly and some of them were out of school.

Considering this situation, BRAC Research and Evaluation Division (RED) conducted a formative research supported by UNICEF to provide a basis for nutritional health promotion in adolescents by documenting their dietary practices and identifying areas where strategies can be focused. The conclusions and recommendations from the study provide more evidence for formulation strategy of appropriate interventions package for adolescents in Bangladesh.

## 1.3 OBJECTIVES

### General objective

The study aimed to explore the eating patterns and related factors among adolescent girls, member of adolescent clubs in two selected districts in Bangladesh.

### Specific objectives

The specific objectives were:

- ▶ to understand the dietary pattern of adolescent girls
- ▶ to investigate food preferences/choices and its determinants among adolescent girls
- ▶ to understand how adolescent girls exercise their food and eating preferences

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## METHODOLOGY

### 2.1 STUDY DESIGN AND STUDY AREA

A formative research was carried out in Dhaka (two areas: Uttara and Shayamoli zone) which were basically belong to urban slum and Jamalpur (two sub-districts: Jamalpur Sadar and Sarishabari) districts which represents rural areas of the country where UNICEF has started an adolescent nutrition programme. We selected the study areas from both urban and rural areas to capture the variation in food related behaviour and practice. A cross-sectional design was employed using both quantitative and qualitative approaches.

### 2.2 STUDY POPULATION

Adolescent girls of selected BRAC-ADP clubs of Dhaka and Jamalpur districts were the target population of this study. Inclusion criteria were adolescent girls aged 10-19 years old members of selected BRAC-ADP clubs in Dhaka and Jamalpur districts and adolescent girls who have completed at least primary education (grade V).

### 2.3 SAMPLE SIZE AND SAMPLING STRATEGY

Sample size was calculated based on the proportion of women with minimum dietary diversity (29%) reported by Food Security and Nutrition Surveillance Project in 2013 (HKI and JPGSPH 2014). The absolute precision of 0.05 and 95% confidence level were considered. The minimum sample size was calculated using the following formula:

$$n = z^2 pq/\alpha^2$$

n is denoted for sample size

z value is 1.96 at 95% confidence interval

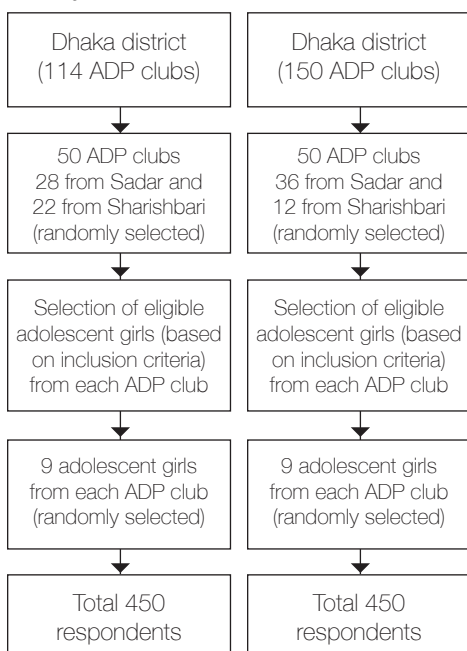


$p$  is % of adolescent meeting minimum dietary diversity (29%)  
 $q = (1-p)$  and  $\alpha =$  margin of error (5%).

With Design Effect of 1.2 the sample size would be 379 which then rounded up to 400 for each district and thus total sample size was 800 initially.

A two-stage random sampling procedure was done. Fifty ADP clubs were randomly selected from each of the two districts. Then from each sampled clubs, nine respondents were randomly selected from the total number of eligible adolescents of that club (Figure 2.1). As adolescents were responsible to filled up the food diary, so there is a chance of keeping the dairy incomplete. Considering this, one additional adolescent from each of 100 clubs was included. Thus, a total of 900 adolescent girls, 451 from Dhaka and 449 from Jamalpur were included in this exercise from 100 ADP clubs (50 from Dhaka and 50 from Jamalpur). Qualitative exploration was also carried out to elaborate the findings from quantitative assessment.

**Fig 2.1**  
**Sampling strategy for quantitative survey**



**Table 2.1**  
**List of respondents for qualitative exploration by areas**

Respondents and mode of interview	Dhaka	Jamalpur	Total
<b>(a) In-depth interview (IDI)</b>			
Adolescent girls	10	10	20
Mother of adolescent girls	4	4	8
Father of adolescent girls	2	2	4
<b>(b) Key Informant Interview (KII)</b>			
BRAC ADP staff (Programme Organiser)	2	2	4
Shopkeeper	2	2	4
Secondary School teacher	2	2	4
<b>(c) Focus group discussion (FGD)</b>			
Adolescent girls	2+6	2+4	14
<b>Total</b>			<b>58</b>

Purposive sampling (maximum variation in terms of age, education, and cluster etc.) was used to select the study participants for qualitative exploration. Focus group discussions (FGDs) and in-depth interviews (IDIs) was conducted with adolescent girls along with their mothers, fathers, relevant shopkeepers, school teachers and ADP BRAC staffs (Table 2.1). Number of FGDs and IDIs were determined based on data saturation (Guest et al. 2006). That is, when additional information would not be received from subsequent interview, the study would stop interviewing.

## **2.4 DATA COLLECTION TOOLS PROCEDURES**

We used several tools including a seven-day diary, and checklists for FGDs and IDIs to collect information to address the objectives of the study.

A pre-tested semi structured seven-day (includes both weekdays and weekend) food diary was provided to the adolescent girls for gathering prospective data on dietary items and their eating patterns. The aim of the food diary was not to provide quantitatively precise estimates of nutrient intakes, but rather to assess the food preferences and intake of important sources of nutritionally significant foods as well as the intake of a number of popular less-nutrient dense food items. Thus the information from diaries were then used to determine the frequency of intake, not the quantity of foods consumed. Information regarding socio-economic background (including wage if involved in income generating activities), perception of healthy diet, eating habits, time and frequency of eating, food choices/preferences, types of foods that are commonly consumed, foods that are purchased and preferred from the market, money spent on buying food, change in diet during menstruation, physical activity, self-rating on health and decision-making about own food will also be extracted through diary.

FGDs and IDIs were conducted with a sub-sample of already selected participants and other relevant respondents (their mothers, fathers, relevant shopkeepers, school teachers and BRAC-ADP staff) for better understanding of overall eating behaviour as well as its determinants which will complement the information obtained by diary.

Based on the study objectives, food diary and different checklists were developed. All the instruments were pretested before finalisation. Research assistants with experience on dietary assessment were recruited and trained sufficiently (three days long including field testing) so that they can guide participants in completing diary and can conduct IDIs and FGDs. Data collection period was April-May, 2016.

## **2.5 DATA ANALYSIS**

Data collected from dietary diary was managed using MS Excel processor and SPSS software (version 20).

Information from FGD and IDI were recorded, transcribed and manually analysed by using qualitative content analysis following the concept of Graneheim and Lundman model (Graneheim and Lundman 2004).

## **2.6 QUALITY CONTROL**

The research assistants has been trained extensively on the goal and objectives of the study, dietary diary, discussion guides for IDIs and FGDs before data collection. All checklists were pretested in the field, modified and finalised based on feedback from the respondents. Research assistants delivered approximately three hours of training and instruction to the selected adolescents on how to answer/respond/complete the seven-day dairy with relevant questions and then participants completed the seven-day diary by themselves. In addition, all interviews and FGDs were carried out by female research assistants only in order to allow the adolescents to speak freely.

## **2.7 ETHICAL ISSUES**

The study protocol was approved by the ethical review committee (ERC) of James P. Grant School of Public Health, BRAC University. Moreover, written informed consent was sought from respondents and parent/guardian before each interview. Participants affirmed to give their voluntary and autonomous consents were participated in interviews. Confidentiality and anonymity was highly maintained.

## RESULTS

### 3.1 BACKGROUND CHARACTERISTICS OF RESPONDENTS AND THEIR HOUSEHOLDS

This section of the findings provides an overview of basic socioeconomic characteristics of the respondents which includes age, education, occupation and monthly income. This part also describes some basic characteristics of households of adolescent girls. The background information is necessary to interpret findings and also to make results understandable.

#### 3.1.1 Characteristics of the households

Household information was collected only of those adolescent girls who had participated in seven day food diary exercise. As adolescents were responsible to filled up the food diary, so there was a chance of keeping the diary incomplete. Considering this, one additional adolescent from each of 100 clubs was included. Thus a total of 900 adolescent girls, 451 from Dhaka and 449 from Jamalpur were included in this exercise from 100 ADP clubs (50 from Dhaka and 50 from Jamalpur). As shown in Table 3.1, the overall average household size is 5.1 persons which was slightly larger in Dhaka (5.2 persons) than in Jamalpur areas (4.9 persons). The average monthly family income was 12716.80 BDT (USD 161.79) which is higher in Dhaka compared to Jamalpur (14424.40 BDT vs. 11001.60 BDT or USD 183.52 vs. USD 139.97). With regard to educational attainment of parents, more than half (51.2%) of the mothers and nearly half (46.2%) of the fathers had never been in school while only 3.9% of mothers and 10.8% of fathers had completed secondary or higher level education. Overall, educational attainment was better among fathers than among mothers and this scenario is almost similar in both districts. Occupational status of their mothers showed that 56.1% were housewives in Dhaka and this percentage was 89.5% among the mothers who live in Jamalpur. In other words, percentage of mothers who were engaged in any income generating activities were

significantly higher in Dhaka compared to those from Jamalpur (44% vs. 11%). Among the father's in rural areas (Jamalpur) mostly involved with agriculture (29.8%) whereas, in urban areas (Dhaka) mostly of them were day-labour (33.7%). Around one fifth of the fathers in both areas were involved in business.

**Table 3.1**  
**Socio-demographic characteristic of the households**

Characteristics	Dhaka (n=451)	Jamalpur (n=449)	Overall (n=900)
Mean household size (persons)	5.2	4.9	5.1
Average monthly household income – BDT (USD)	14424.40 (183.52)	11001.60 (139.97)	12716.80 (161.79)
Median household income – BDT (USD)	13000.00 (165.39)	10000.00 (127.23)	11000.00 (139.95)
Mother's education (%)			
No education	49.9	53.9	51.9
Grade I-IV	17.5	12.2	14.9
Grade V	19.3	14.5	16.9
Grade VI-IX	7.3	14.9	11.1
SSC and higher	3.6	4.2	3.9
Don't know	2.4	0.2	1.3
Father's education (%)			
No education	43.2	49.2	46.2
Grade I-IV	10.6	12.7	11.7
Grade V	17.5	12.5	15.0
Grade VI-IX	13.1	14.0	13.6
SSC and higher	10.0	11.6	10.8
Don't know	5.5	0.0	2.8
Mother's main occupation (%)			
Housewife	56.1	89.5	72.8
Service	22.2	4.9	13.6
Maid	14.4	0.2	7.3
Others <sup>a</sup>	7.3	5.4	6.3
Father's main occupation (%)			
Agriculture	0.7	29.8	15.2
Service	17.1	12.0	14.6
Business	26.8	22.1	24.4
Day-labour	33.7	23.2	28.4
Driver	4.9	5.6	5.2
Others <sup>b</sup>	8.4	4.7	6.6
Not applicable	8.4	2.7	5.6

Others <sup>a</sup> -Foreign, Labour, Business, Chef, Sewing, tailor, Cleaner, Garments Worker, Not Applicable (Dead)

Others <sup>b</sup> -Unemployed, Foreign, Member, Tailor, Village Doctor, Chef, Handwork, Garments Worker

### 3.1.2 Characteristics of the respondents

Basic background characteristics of the adolescent girls are presented in Table 3.2. The age distribution of the adolescent girls showed that overall 58.6% were in their early adolescence (10-14 years), and the rest belonged to the late adolescence group (15-19 years) which varied widely among girls from Dhaka and Jamalpur. In Dhaka, 67.9% of the girls were in their early adolescence whereas in Jamalpur about half (49.2%) of them belonged to this age group. Consequently the mean age of girls from Dhaka was smaller (13.7 years) than girls from Jamalpur (14.6 year). In accordance with age, educational status of adolescent girls is lower in Dhaka compared to girls from Jamalpur. One of the participant inclusion criteria was adolescent girls have to complete at least primary education that is grade V. About 5.1% of the adolescent girls from Dhaka completed secondary or higher education while 13.4% of the girls from Jamalpur had such educational attainment. While considering age specific education, around 95% of older girls passed at least grade VI or above, which was around 65% among younger girls (see Annexes Table 1A). Majority (95.4%) of the adolescent girls from both areas primarily involved in studying. Percentage of adolescent girls involved in different types of income generating activities was significantly higher in Jamalpur compared to the girls living in Dhaka (22.5% vs. 9.5%).

**Table 3.2**  
**Characteristics of the adolescent girls**

Characteristics	Dhaka (n=451)	Jamalpur (n=449)	Overall (n=900)
Mean age (years)	13.7	14.6	14.1
Age group (%)			
10-14 years	67.9	49.2	58.6
15-19 years	32.2	50.8	41.4
Educational attainment of adolescent girls (%)			
Grade V	35.7	9.8	22.8
Grade VI-IX	59.2	72.8	66.0
SSC and higher	5.1	13.4	11.2
Main occupation of adolescent girls (%)			
Student	93.8	97.1	95.4
Teaching (private)	1.1	0.0	0.6
Unemployed	2.7	0.2	1.4
Others <sup>a</sup>	2.4	2.7	2.6
Involvement of adolescent girls with any income earning activities <sup>b*</sup> (%)	9.5	22.5	16.0

<sup>a</sup>Others- Service, tailoring

<sup>b</sup>Such as: Teaching, handicrafts, tailoring/sewing, beauty parlor job, theatre job.

\*Some students also involve in income generating activities though their main job is studying.

## **Characteristic of respondents of qualitative assessment**

### ***Adolescent girls (n=52)***

A total of 52 adolescent girls from BRAC-ADP participated in FGDs (32 girls) and IDI sessions (20 girls). Among the respondents, 58% (n=30) were 10-14 years of age and rest 42% (n=22) were 15-19 years of age. About one-fifth of the girls (n=9) had graduated from primary schools, 60% (n=33) were high school dropouts and about 20% (n=10) had completed secondary education. All adolescent girls were students except 7 those who are engaged either in sewing/tailoring or tuition.

### ***Parents (n=12)***

A total of 8 mothers of adolescent girls were participated in the in-depth interview sessions. The average of their age was 35 years. Among them, two have no formal schooling, two have some primary schooling (up to grade IV) and four had completed primary education (grade-V). Most of them were housewife and two of them were housemaid. In total four fathers of adolescent girl were interviewed in this study. Among them, two were day labours, one involved in agriculture and one worked in a hotel as a chef. Two fathers had never been to school and other two had completed some primary education (grade I-IV). Their average age was 49 years.

### ***BRAC staffs (n=4) and teachers (n=4)***

Among the 4 BRAC staffs interviewed in this study, two were programme organiser (POa) and two were field organisers (FOs) of ADP. These respondents were closely working with adolescent girls for on average of seven years. All of them were completed at least higher secondary education. Their average age was 34 years and all of them were female. The selected teachers (n=4) involved in teaching in the secondary high school for 12 years. Regarding educational attainment, all of them were completed graduation and in addition two of them also had Master's degree. All the teachers were female and their average age was 40 years. Teachers were seemed to be very concern about the health and nutrition of adolescent girls.

### ***Shopkeepers (n=4)***

Altogether 4 shopkeepers were interviewed in this study. Respondent shopkeepers were operating general stores near secondary school compound for on average eight years. One shopkeeper had never been to school and rest three had completed at least primary education (grade V). Their average age was 33 years. Among the shopkeepers we interviewed, one had an adolescent daughter and one had an adolescent sister.

## 3.2 KNOWLEDGE AND PERCEPTION ABOUT HEALTHY DIET AND CARE DURING ADOLESCENT PERIOD

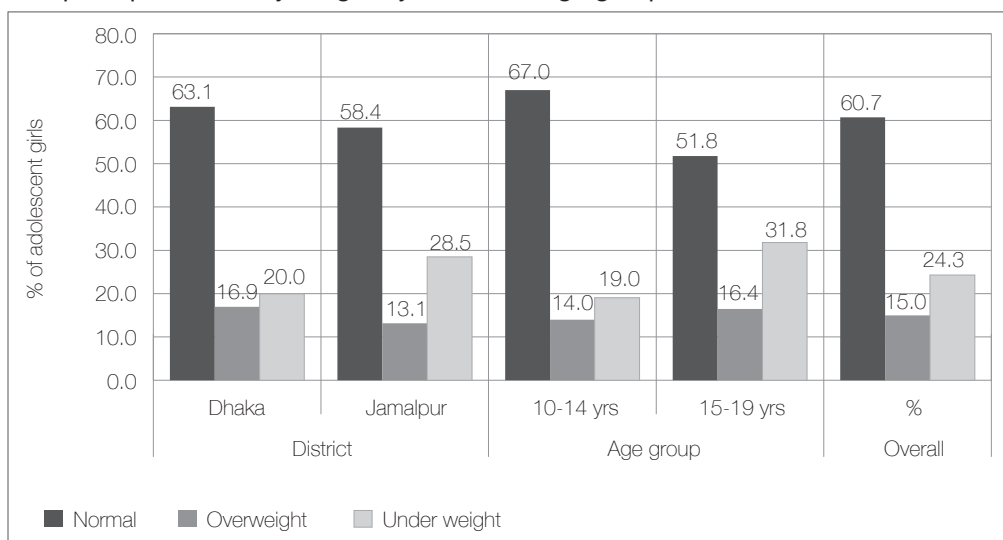
### 3.2.1 Adolescent girls' knowledge and perception on healthy diet

The present study explored understanding of adolescents about healthy diet through FGDs and IDIs. It was found that respondents had good knowledge about the healthy diet. According to most of them healthy diet should compose of foods from all food groups in sufficient amount to meet the requirements of all nutrients for a healthy body and to prevent from diseases. When adolescents were asked to give their perceptions of unhealthy food, they correctly responded and moreover they also have comprehensive knowledge about the negative consequences of consumption of these foods. The majority of the adolescent girls commonly identified fast foods, oily/fatty foods, spicy foods, cheap and unhealthy foods from shops, soft drinks, fried or over cooked/processed foods and open street foods as unhealthy foods as these foods are high in fat, sugar and calories; bad for health, and lacking nutritional value. Considering region, girls from Jamalpur were more aware of and knowledgeable about nutrition, consumption of balanced food etc. than the girls from Dhaka.

### 3.2.2 Adolescent girls' perception on their body weight

Figure 3.1 presents the perception of the adolescents on their body weight according to areas and age groups. Findings showed that more than half of the girls in Dhaka (63.1%) and Jamalpur (58.4%) perceived their body weight as normal

**Fig 3.1**  
Self-perception of body weight by areas and age groups





and this perception is more common among girls from early adolescent group. Overall, about 15% of the girls perceived that they had overweight which was slightly higher in Dhaka and among late adolescent group. On the other hand 24.3% girls perceived them as underweight which was more common among girls from Jamalpur and within late adolescent group. Overall 7.2% of adolescent girls thought about diet control to maintain perfect body weight and 9.9% performed regular physical exercise for the same purpose which was almost three times higher in Jamalpur (14.9%) than Dhaka (4.9%) (Table 3.3).

**Table 3.3**  
**Adolescent’s perceptions and practices on diet control and physical activities**

Characteristics	District		Age group		Overall
	Dhaka (n=451)	Jamalpur (n=449)	10-14 years (n=527)	15-19 years (n=373)	% (n=900)
Thought about diet control (%)	8.0	6.5	5.9	9.1	7.2
Performed regular physical exercise (%)	4.9	14.9	9.1	11.0	9.9
Both diet control and physical exercise (%)	1.8	2.9	2.5	2.1	2.3

### 3.2.3 Perception on healthy eating and its importance during adolescent period

In the present study, parents of adolescent girls, BRAC-ADP staffs, teachers and shopkeepers were asked about the importance of healthy eating during adolescence. Almost all of them believe that in the adolescence period, girls need extra care and nutritious food because this is a fast growing phase of life and they need additional nutrients. One of the mothers mentioned that *‘For proper physical growth and mental development, adolescent girls need to consume balanced diet including fish, meat, milk, seasonal fruits like: guava, blackberry, olive, mango, jackfruit, banana, etc. and seasonal vegetables like: different kind of green and red leafy vegetable, bitter gourd, pumpkin, gourd, etc. on regular basis’*.

In addition to foods/dietary behaviour, most of the mothers mentioned about care during menstruations period as an important factor for adolescent girls. They commonly said that cleanliness and hygiene practice during menstruation is also important for healthy life of adolescent girls. Few mothers from Dhaka mentioned that consumption of vitamin A rich foods is important for their adolescent’s girls. Some mothers and staffs stated that adolescent girls need to eat iron rich foods like internal organ meat (eg liver, heart kidney) to replenish blood losses during menstruation. Some of them also mentioned about adolescent anaemia and its consequences if not consumed sufficient nutritious foods.

Another important factor for emphasising care during adolescent period as stated by almost all mothers in Jamalpur and one mother from Dhaka was that the adolescent

girl is a potential bride as well as future mother. Fathers also had similar thought. For example, according to one father from Jamalpur “Additional care for adolescent girls is necessary as because within next 4 to 5 years she will get married and it is necessary to maintain good health during this period”. *‘Adolescent girls need to eat more foods because after marriage they will get pregnant and will give birth. They have to be prepared from now so that in that time they don’t have to suffer in anaemia and other related health problems’* another father added. One teacher also emphasised on consumption of iron and folic acid rich foods and drinking sufficient water in adolescent period especially during menstruation. According to a shopkeeper, adolescent girls need to consume at least three full meals consist of homemade nutritious food regularly.

### **3.2.4 Role of parents, staff, teachers and shopkeepers in adolescents’ dietary habit**

The present study also asked respondents about their role in improving adolescents’ eating behaviour. All respondents said that from the childhood, mothers are mostly responsible for the dietary behaviour of adolescent girls as mothers are mostly involved with menu planning and food preparation including cooking. Most of the mothers said that they suggest the adolescent girls what to eat or not to eat as per their knowledge and sometimes forced them to act accordingly.

Main role of father in adolescents’ food consumption is to buy food for the household. Most of the fathers give expression that they are doing their best about her daughters’ diet. One shopkeeper retorted that there is very limited scope for them to play role in this regards. Though they take care of their own adolescent girls about proper diet or healthy food consumption. One shopkeeper opined that *“I am a businessman, so my main consideration is business. Those who manufacture these foods in unhealthy way, we can make them aware to produce healthy foods in healthy way. Mothers and fathers can play great role in improving awareness and practice of healthy dietary behaviours. But we can keep more nutritious foods in our shop also”*.

Almost all teachers said that they provided different types of tips regarding eating behavior, nutrition, body weight and overall health to the adolescent girls in different times. Similar opinion was echoed by staffs also. Teachers informed that from class-III to class-X, each year there are some chapters on nutrition, food, menstrual hygiene and overall health of adolescents. Teachers suggested girls to perform physical exercise regularly to maintain perfect body weight rather than skipping the meals. Both staffs and teachers advised them to bring homemade food instead of outside foods and explained the consequences of unhealthy foods consumption. They encouraged adolescent girls to consume diversified foods and iron rich foods to maintain good health in this period. One teacher from Dhaka recommended students to drink a glass of milk every day before going to bed. According to the respondents, *“BRAC in collaboration with school can play important role in improving*

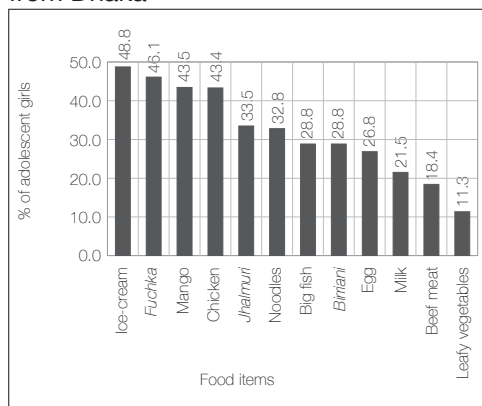
*the situation by sensitizing adolescent girls and also their parents about the eating behavior of girls and their additional requirement in this stage of life".*

### 3.3 FOOD PREFERENCES BY ADOLESCENT GIRLS

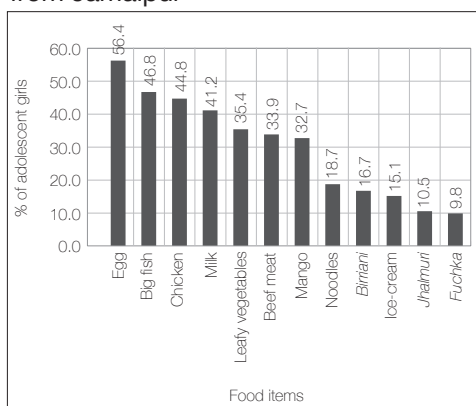
#### 3.3.1 Food preferences

To identify and to provide a better understanding about food preferences among adolescents was one of the study objectives. For this purpose, adolescents were asked to write down the 10 most preferred food items on their diary. Most frequently cited 12 food items are presented in the Figure 3.2, 3.3 and 3.4. Substantial variation

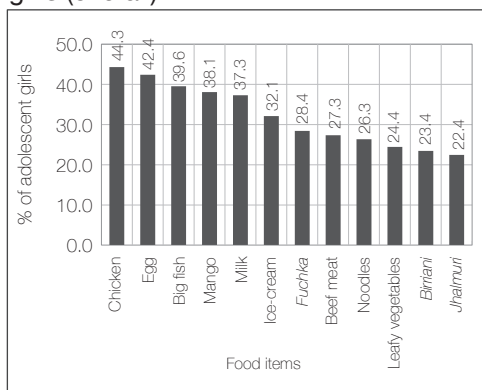
**Fig 3.2**  
Food preferences by adolescent girls from Dhaka



**Fig 3.3**  
Food preferences by adolescent girls from Jamalpur



**Fig 3.4**  
Food preferences by adolescent girls (overall)



was observed on food preferences by areas which may be the clear reflection of availability of the food items. In Dhaka, most commonly preferred food items by adolescent girls were ice-cream (48.78%), *fuchka* (46.1%) and mango (43.5%). In Jamalpur, adolescent girls preferred egg (56%), big fish (46.8%) and chicken (44.8%). Milk (21.5%), beef (18.4%) and leafy vegetables (11.3%) were least preferred by girls from Dhaka while in Jamalpur least preferred food items were ice-cream (15.1%) *jhalmuri* (10.5%) and *fuchka* (9.8%). In Jamalpur, milk (41.2%) was also one of the mostly preferred food

by adolescent girls which was preferred by only 21.5% of girls in Dhaka. Chicken was almost equally popular among girls from both regions. Popularity of *jhalmuri* was significantly lower among girls in Jamalpur compared to Dhaka. Findings also indicated that food preferences do not significantly varied according to age groups (see details in annexes, Table 2A).

In qualitative exploration, adolescent girls were asked about the types of foods they avoid. Most of the adolescents reported that a) some fishes like Pangas, Eel, Magur, Tilapia and dry fish for bad smell, b) Mutton, Duck due to bad smell c) some vegetables such as Bitter Gourd for Bitter taste, Green Papaya for tastelessness, Okra for slippery Texture, Radish for bad smell, Arum and Loti for irritation on throat or allergy were commonly avoided from their daily meals. They also avoided some other allergic foods and fatty/oily foods. Mothers also had similar opinion. Few mothers mentioned about milk and sweet as unpopular foods for causing vomiting tendency. Sometimes mothers forbid to eat sour foods because they perceived that it would dilute their blood. Fathers of adolescent girls mentioned that most of the adolescent girls dislike vegetables and oily/fatty foods. According to a father from Dhaka *“Adolescent girls are very fond of outside foods or foods from shops like chips, singara, puri, jhalmuri, chanachur, biscuits, pickles etc.”*

### 3.3.2 Determinants of food preferences

The most influencing factors regarding food choices or preferences was explored through interviews. All respondents came to the consensus that the most important factor for food choices or preference were 1) the taste and appearance of the foods, 2) availability of money, and 3) availability of foods. Only few respondents mentioned about adolescent girls' concern about body weight as a determinants of food choice. *“Adolescents avoid certain foods if they think that consumption of those foods will increase their body weight”* one father added.

Almost all respondents reported that though adolescent girls are much aware about the nutritional significance of foods, they do not consider it during purchasing or consumption of foods. *“Adolescent girls do not consume food by considering nutritional value at all, they only consider their own taste”* one mother stated. One adolescent girl also said *“Consumption of these foods is only because of taste not for nutrition or health”*. *“They didn't buy food considering nutritional value but for their own taste. They also consider the price of the food as they have limited money”* according to one shopkeeper. Only few girls consider nutritional value of foods during food purchasing as well as consumption of foods. *“They didn't buy food considering nutritional value but for their own taste. They also consider the price of the food as they have limited money”*.

### 3.4 PURCHASE OF READY-TO EAT FOODS BY ADOLESCENT GIRLS

This study found that consumption and purchasing of ready-to-eat foods is common among adolescents in Bangladesh. This section of findings provides information on commonly purchased ready-to-eat food items, frequency of purchasing, expenditure on this purpose and also the sources of money to buy ready-to-eat foods by adolescent girls. Alarming, about 13% of the respondents purchase any ready-to-eat food items for their own consumption in everyday of a week which significantly varied according to age group as well as areas (Table 3.4). Adolescent girls from Dhaka found to have purchased ready-to-eat foods more frequently than girls from Jamalpur. In addition, this study findings indicates that about 84% of the adolescent girls purchase ready-to-eat foods at least once or more times in a week. Shops near to home or school was the most common source of purchasing ready-to-eat foods followed by market, vendor and local restaurant in Dhaka. This was true for Jamalpur also. Average of money spent on ready-to-eat foods was BDT 64.5 (USD 0.82)/week per adolescent girls those who purchase ready-to-eat foods. This expenditure significantly varied according to areas [BDT 81.70 (USD 1.04) in Dhaka vs. BDT 47.20 (USD 0.60) in Jamalpur and between the age groups; BDT 73.40 (USD 0.93) for 10-14 years vs. BDT 52.00 (USD 0.66) for 15-19 years]. Fathers of adolescent girl was cited as main (49.4%) source of money in this purpose followed by mothers (28.6%).

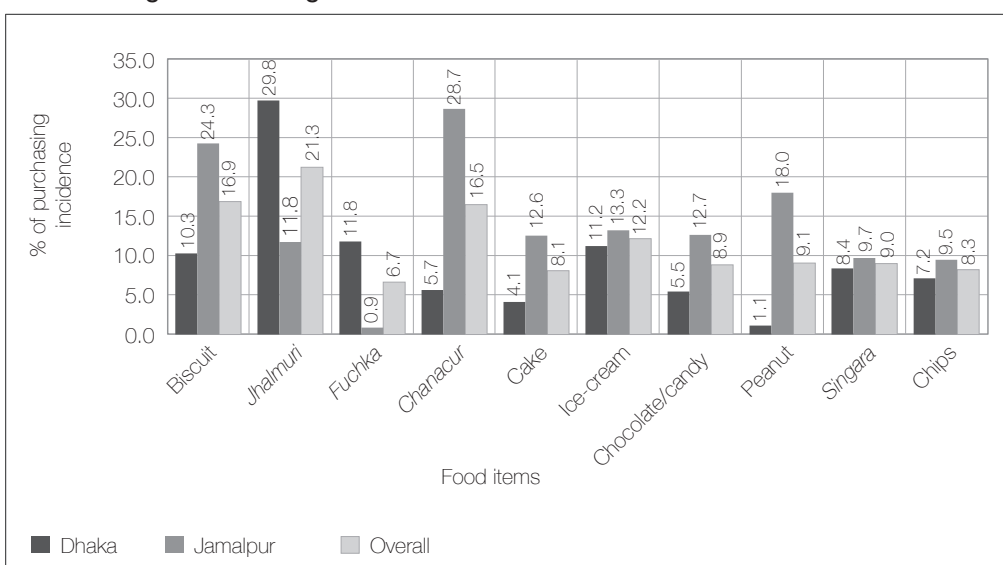
**Table 3.4**  
Information on purchasing foods by adolescents (last seven days)

Characteristics	District		Age group		Overall % (n=900)
	Dhaka (n=451)	Jamalpur (n=449)	10-14 (n=527)	15-19 (n=373)	
Purchase of ready-to-eat foods in a week					
Not a single day/week	14.9	17.4	12.7	20.9	16.1
1-3 days/week	39.7	41.9	37.2	45.8	40.8
4-6 days/week	29.7	30.7	33.4	25.7	30.2
7 days/week	15.7	10.0	16.7	7.5	12.9
Sources of purchasing (% of responses)					
Nearby shop	70.1	82.5	75.8	75.6	75.8
Market	10.4	12.0	11.7	9.8	11.1
Vendor	17.0	4.6	10.9	12.1	11.3
Local restaurant	2.5	1.0	1.5	2.4	1.8
Money (mean) spent on ready-to-eat foods/week – BDT (USD)	81.70 (1.04)	47.20 (0.60)	73.40 (0.93)	52.00 (0.66)	65.00 (0.83)
Source of money (% of responses)					
Father	47.8	51.3	54.7	48.1	49.4
Mother	31.7	25.1	31.0	29.0	28.6
Self	7.8	10.9	6.9	15.7	9.3
Others	12.7	12.8	13.6	13.5	13.5

Figure 3.5 and Figure 3.6 illustrate the detail about the purchasing of ready-to-eat food items in terms of percentage of adolescent girls bought at least once or more in last seven days as well as percentage of purchasing incidence in last seven days. Most commonly purchased food items were biscuit, *jhalmuri*, *chanachur*, *fuchka*, cake, ice-cream, candy/chocolate and peanuts etc. which were mostly carbohydrate based food items. The frequency of purchasing ready-to-eat food items varied significantly based on area, age groups and availability of foods.

**Fig 3.5**

**Percentage of purchasing of ready-to-eat food items in last seven days by adolescent girls according to areas**

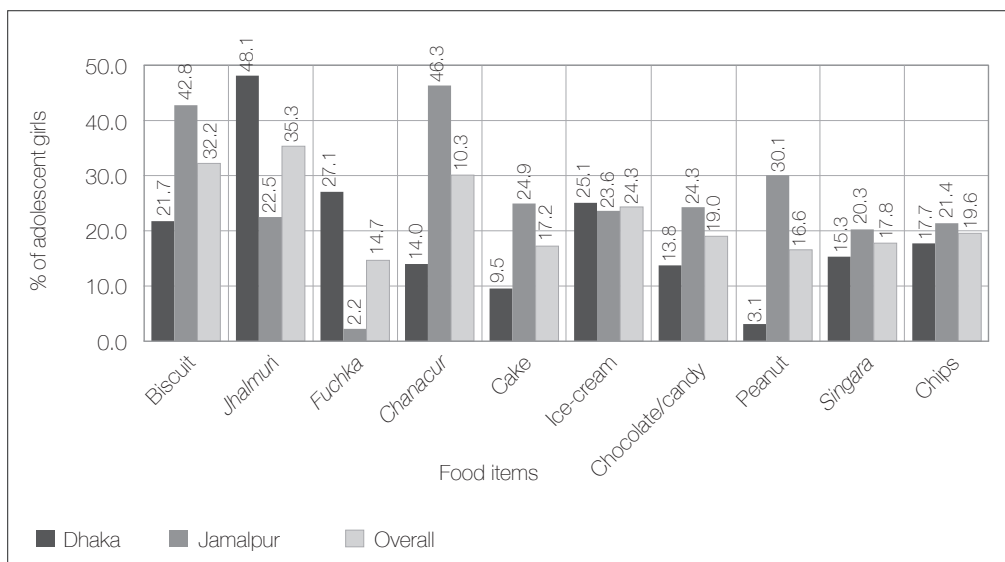


Qualitative findings echoed similarly regarding all aspects of purchasing ready-to-eat foods. During purchasing these foods adolescent girls consider mainly their own choice or taste, affordability and availability of those foods. They do not consider the nutritional value of those particular food items to purchase them. One adolescent opined that *“Consumption of these foods is only because of taste not for nutrition or health. We bought and consume it because if we bring tiffin from home, our bag become heavy and as distance between home and school is long it become tougher to us to bear. So, our parents give 10-20tk for tiffin daily and we buy different foods from shops”*.

According to the adolescent girls, the main source of money for purchasing processed food was father followed by mother and themselves. On average, the expenditure for purchasing ready-to-eat food in the previous 24 hours was around

BDT 10. In general, consumption of ready to eat foods was low in Jamalpur. In slum areas, availability of low quality ready-to-eat foods with relatively low cost was one of the reasons for choosing and consuming of those foods.

**Fig 3.6**  
**Percentage of adolescent girls those who has purchased ready-to-eat food items at least once or more during last seven days according to areas**



Sixteen participants out of 52 bought soda/soft drinks/juice in the previous week of the interview. The most commonly cited brand name was 7 up and other brands were Mirinda, Mojo, Fanta, Fruto, Pran mango juice and Tiger. Most of them bought once in last week except four participants (out of 16). Few of the participants reported that they did not buy soda regularly, but rather they purchase it only in special occasions such as Eid, wedding ceremony, *puja* etc. Some of the girls believed that drinking soda could cause difficulty to conceive. Among 52 adolescent girls, 14 had bought chips in the previous week of the interview. Most commonly cited brand name was Bombay potato chips and most of them bought once in last week except four participants (out of 14). Parents reported that though girls were aware about the negative health consequences of consuming these foods, they still bought and consume these ready to eat foods from shops.

### 3.5 FOOD CONSUMPTION AND DIETARY DIVERSITY

Food consumption behaviour along with food availability and food accessibility is an important indicator of food intake at individual level. To improve nutritional status, to maintain perfect body weight and to reduce risk of non-communicable diseases, there is a need for consuming diversified diets. Dietary diversity can be defined as the number of individual food items or food groups consumed over a given period of time. It is measured by counting the number of food groups rather than food items consumed commonly. Though FAO suggested 24 hour recall period, there are various other valid time frames for recall, such as the previous three or seven days, and in the case of some foods, the previous month to assess individual's habitual diet (FAO 2011; WFP 2009; Swindale and Bilinsky 2006).

In this study, information on food consumption was collected by documenting day to day food intake by the study participants by keeping diary for a period of seven days. Dietary data collection by using food diary is one of the established method which help to remove recall bias by the participant (Cantwell et al 2006). Food consumption of the participant adolescent girls were documented in food item level, thus data allowed advance analysis from different points of view. The nine food groups proposed by FAO for women dietary diversity analysis was used in this report to assess adolescent girls' food consumption and dietary diversity.

A total of five meals per day (breakfast, mid-morning snacks, lunch, afternoon snacks and dinner) was considered during dietary data collection. Detail information on food items and meals reported in annexes (Table 16A, 17A, 18A, 19A and 20A). Findings from both food diary and qualitative section revealed that most of the girls from Jamalpur consumed rice with mashed potato or other vegetables/vorta, fried egg, fried vegetables/vaji and leafy vegetables during breakfast regularly. On the other hand, in Dhaka, adolescent girls commonly eat ban/bread, tea, porota/ruti with fried vegetables and sometimes they also eat rice with egg or vegetables fry and sometimes only *singara*, *samosa* etc. For lunch most of them take rice with vegetables and lentil, fish, egg and also meat especially chicken. Food consumption pattern during dinner was almost same as lunch in both areas.

Milk consumption at dinner was mentioned by most of girls from Jamalpur. Consumption of different seasonal fruits was also high among the girls from Jamalpur compared to girls who lives in Dhaka. Among the ready to eat foods from shops they usually consume biscuit, *chanachur*, *singara*, *samosa*, pickle, seasonal fruits (e. g. banana, mango, guava, pulm, and olive), muri and chocolate etc. Consumption of snacks (during mid-morning and afternoon) and consumption of junk foods was comparatively higher among girls from Dhaka compared to girls living in Jamalpur.



**Table 3.5**  
**Percentage of girls consuming foods from  $\geq 4$  food groups in seven days period**

Categories	District		Age group		Overall (%)
	Dhaka (%) (n=451)	Jamalpur (%) (n=449)	10-14 years (%) (n=527)	15-19 years (%) (n=373)	
Frequency of consuming foods from $\geq 4$ groups					
Every day in a week	25.1	45.2	34.2	36.5	35.1
4-6 days in a week	56.1	48.6	52.9	51.5	52.3
1-3 days in a week	18.2	6.2	12.7	11.5	12.2
Never in a week	0.7	0.0	0.2	0.5	0.3
Consumption of foods from $\geq 4$ food groups on last 24 hour	72.7	87.8	80.0	80.7	80.2
Consuming foods from $\geq 4$ groups per day (day-type wise)					
Normal day	71.8	84.4	77.2	79.1	78.0
Festival day	95.7	90.9	94.7	87.5	92.1
Weekend day	74.0	87.4	82.0	78.9	80.8

In this report, nine food groups (1. starchy staples, 2. dark green leafy vegetables or DGLV, 3. vitamin A rich fruits and vegetables, 4. other fruits & vegetables, 5. organ meat, 6. meat and fish, 7. egg, 8. legumes, nuts & seeds and 9. milk & milk products) proposed by WHO for calculating women dietary diversity (WDD) was used to assess dietary diversity among adolescent girls (FAO 2010). Table 6 displays the percentage of adolescent girls consuming food items from at least four or more food groups in a day for seven days period. The findings revealed that consumption of foods from four or more food groups daily in the study week was significantly higher ( $p < 0.00$ ) among the girls from Dhaka compared to Jamalpur (25.1% vs. 45.2%) and do not varied significantly according to age groups which clearly indicated that girls from Jamalpur consume more diversified foods compared to girls from Dhaka.

Unfortunately, still 12.2% of the adolescent girls consume foods from  $\geq 4$  food groups only 1-3 days in a week. Girls in both districts usually consumed more diversified food during festive days compared to normal day and weekend in both areas. Considering a week, mean dietary diversity score (DDS) was 4.5 which means they consume minimum dietary diversified foods which significantly ( $p < 0.001$ ) varied according to areas (Dhaka 4.3 vs. Jamalpur 4.8) though didn't differ by age groups (Table 3.6). When DDS was calculated based on last 24 hours, it was almost similar to the DDS calculated based on last seven days consumption.

**Table 3.6**  
**Mean dietary diversity score (DDS) among adolescent girls**  
**by areas and age groups**

Categories	District		Age group (years)		Overall (n=900)
	Dhaka (n=451)	Jamalpur (n=449)	10-14 (n=527)	15-19 (n=373)	
Mean DDS on last 7 days	4.3	4.8	4.5	4.5	4.5
Mean DDS on last 24 hour	4.2	4.9	4.6	4.5	4.6

The percentage of girls consuming foods from nine food groups are presented in Table 3.7 whereas, Table 3.8 displays the consumption of protein rich foods by areas and age groups. About 19%, 21.9%, 11.3% and 30.8% of adolescent girls never eat dark green leafy vegetables (DGLVs), other vitamin A rich fruits and vegetables, egg and milk/milk products in a week, respectively. Of different animal protein source consumed by the girls, the weekly intake of meat, milk and milk products and egg were lower compared to that of fish. Only 4% adolescent girls consumed organ meats at least once in a week.

Consumption of vegetables and fruits were significantly lower among the adolescent girls in both areas. About 46% girls never consumed vitamin A rich yellow-orange vegetables in a week and 20.8% girls never consumed fruits in a week.

**Table 3.7**  
**Percentage of girls consuming foods from nine food groups during**  
**seven days period**

Categories	District		Age group		Overall (n=900)
	Dhaka (n=451)	Jamalpur (n=449)	10-14 years (n=527)	15-19 years (n=373)	
Consumption of starchy staple					
Every day in a week	98.9	100.0	99.1	100.0	99.4
4-6 days in a week	0.4	0.0	0.4	0.0	0.2
1-3 days in a week	0.7	0.0	0.6	0.0	0.3
Never in a week	0.0	0.0	0.0	0.0	0.0
Consumption of DGLVs					
Every day in a week	0.7	4.7	2.5	3.0	2.7
4-6 days in a week	14.0	38.1	22.6	30.8	26.0
1-3 days in a week	56.8	47.9	53.3	50.9	52.3
Never in a week	28.6	9.4	21.6	15.3	19.0

[ Table 3.7 contd... ]

Exploration of eating behaviours among adolescent girls from two selected districts of Bangladesh

[ ...Table 3.7 contd ]

Categories	District		Age group		Overall (%) (n=900)
	Dhaka (%) (n=451)	Jamalpur (%) (n=449)	10-14 years (%) (n=527)	15-19 years (%) (n=373)	
Consumption of vitamin A rich fruits and vegetables					
Every day in a week	2.2	2.7	3.0	1.6	2.4
4-6 days in a week	25.1	23.6	26.0	22.0	24.3
1-3 days in a week	53.0	49.7	51.4	51.2	51.3
Never in a week	19.7	24.1	19.5	25.2	21.9
Consumption of fruits and vegetables					
Every day in a week	17.52	44.77	29.41	33.51	31.11
4-6 days in a week	54.77	45.66	51.23	48.79	50.22
1-3 days in a week	25.94	8.69	17.84	16.62	17.33
Never in a week	1.77	8.69	1.52	1.07	1.33
Consumption of organ meat					
Every day in a week	0.00	0.00	0.00	0.00	0.00
4-6 days in a week	0.00	0.22	0.19	0.00	0.11
1-3 days in a week	3.77	3.12	3.61	3.22	3.44
Never in a week	96.23	96.66	96.20	96.78	96.44
Consumption of meat/fish					
Every day in a week	31.49	59.02	45.54	44.77	45.22
4-6 days in a week	58.76	39.64	49.15	49.33	49.22
1-3 days in a week	9.76	1.11	5.31	5.63	5.44
Never in a week	0.00	0.22	0.00	0.27	0.11
Consumption of egg					
Every day in a week	3.33	2.45	2.66	3.22	2.89
4-6 days in a week	34.15	34.08	36.81	30.29	34.11
1-3 days in a week	50.55	50.55	49.15	55.23	51.67
Never in a week	11.97	11.97	11.39	11.26	11.33
Consumption of legumes/nuts					
Every day in a week	8.43	10.69	8.54	10.99	9.56
4-6 days in a week	50.11	48.11	48.20	50.40	49.11
1-3 days in a week	38.14	37.64	39.47	35.66	37.89
Never in a week	3.33	3.56	3.80	2.95	3.44

[ ...Table 3.7 contd ]

Categories	District		Age group		Overall (%) (n=900)
	Dhaka (%) (n=451)	Jamalpur (%) (n=449)	10-14 years (%) (n=527)	15-19 years (%) (n=373)	
Consumption of milk/milk products					
Every day in a week	0.9	4.5	1.5	4.3	2.7
4-6 days in a week	14.2	16.9	17.1	13.4	15.6
1-3 days in a week	52.6	49.4	52.0	49.6	51.0
Never in a week	32.4	29.2	29.4	32.7	30.8
<b>Other than nine food groups</b>					
Consumption of yellow-orange vegetables					
Every day in a week	0.9	4.5	1.5	4.3	2.7
4-6 days in a week	14.2	16.9	17.1	13.4	15.6
1-3 days in a week	52.6	49.4	52.0	49.6	51.0
Never in a week	32.4	29.2	29.4	32.7	30.8
Consumption of fruits (any)					
Every day in a week	2.44	6.01	4.17	4.29	4.22
4-6 days in a week	23.28	26.95	25.81	24.13	25.11
1-3 days in a week	52.99	46.77	50.85	48.53	49.89
Never in a week	21.29	20.27	19.17	23.06	20.78

**Table 3.8**  
**Percentage of girls consuming different protein rich foods from specific food groups during seven days period**

Categories	District		Age group		Overall (%) (n=900)
	Dhaka (%) (n=451)	Jamalpur (%) (n=449)	10-14 years (%) (n=527)	15-19 years (%) (n=373)	
Consumption of protein-rich food (both plant and animal source)					
Every day in a week	85.8	94.0	89.2	90.9	89.9
4-6 days in a week	13.3	6.0	10.1	9.1	9.7
1-3 days in a week	0.9	0.0	0.8	0.0	0.4
Consumption of animal protein-rich food (meat, fish, egg, milk and milk products)					
Every day in a week	65.2	83.3	74.2	74.3	74.2
4-6 days in a week	32.4	16.3	24.3	24.4	24.3
1-3 days in a week	2.4	0.5	1.5	1.3	1.4
Never in a week	0.0	0.0	0.0	0.0	0.0
Consumption of meat (any)					
Every day in a week	0.4	0.0	0.4	0.0	0.2
4-6 days in a week	17.5	14.7	18.8	12.3	16.1
1-3 days in a week	69.4	63.7	65.3	68.4	66.6
Never in a week	12.6	21.6	15.6	19.3	17.1
Consumption of fish (any)					
Every day in a week	11.8	39.6	24.3	27.6	25.7
4-6 days in a week	63.0	56.1	59.8	59.3	59.6
1-3 days in a week	24.6	4.0	15.6	12.6	14.3
Never in a week	0.7	0.2	0.4	0.5	0.4

About 57% adolescent girls consumed soft drinks/commercially produced juices at least once in a week which was comparatively higher in Dhaka (63%) than Jamalpur (51%). The mean amount of drinking water was 9.53 glasses per day which is almost equal for all areas and age groups (Table 3.9).

**Table 3.9**  
Consumption of water and drinks during seven days period

Characteristics	District		Age group		Overall (%) (n=900)
	Dhaka (%) (n=451)	Jamalpur (%) (n=449)	10-14 years (%) (n=527)	15-19 years (%) (n=373)	
Weekly consumption of soft drinks/juice (%)					
Never	37.0	49.0	42.1	44.2	43.0
1-3 days in a week	50.1	40.5	45.5	45.0	45.3
4-7 days in a week	12.9	10.5	12.3	10.7	11.7
Mean drinking of water per day (glass)	9.2	9.9	9.4	9.7	9.5

### 3.6 MEAL SKIPPING AND ITS DETERMINANTS

#### 3.6.1 Meal skipping pattern

Meal skipping, in particular breakfast skipping is an important phenomena of dietary habit of adolescents which is associated with many socio-psychological factors (Story *et al.* 2002). As seen in Figure 3.7, any meal (among three main meals that is breakfast or lunch or dinner) skipping among adolescent girls varied between the adolescent girls of two districts. Findings depicted that meal skipping was more common in Dhaka compared to Jamalpur. About 22.4% of adolescent girls from Dhaka skipped meal at least three or more times in a week whereas, this figure was only 5.1% among the girls from Jamalpur. Approximately half of the girls in Dhaka and 28.9% of girls in Jamalpur skipped any one of their meals (either breakfast or lunch or dinner) at least once in a week.

**Fig 3.7**  
Percentage of adolescent girls who skipped any meal (breakfast/lunch/dinner) at least once or more in a week by areas and age groups

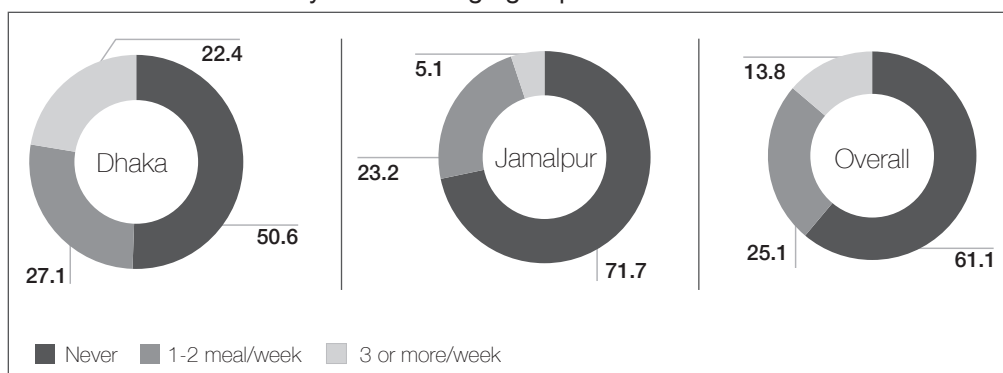
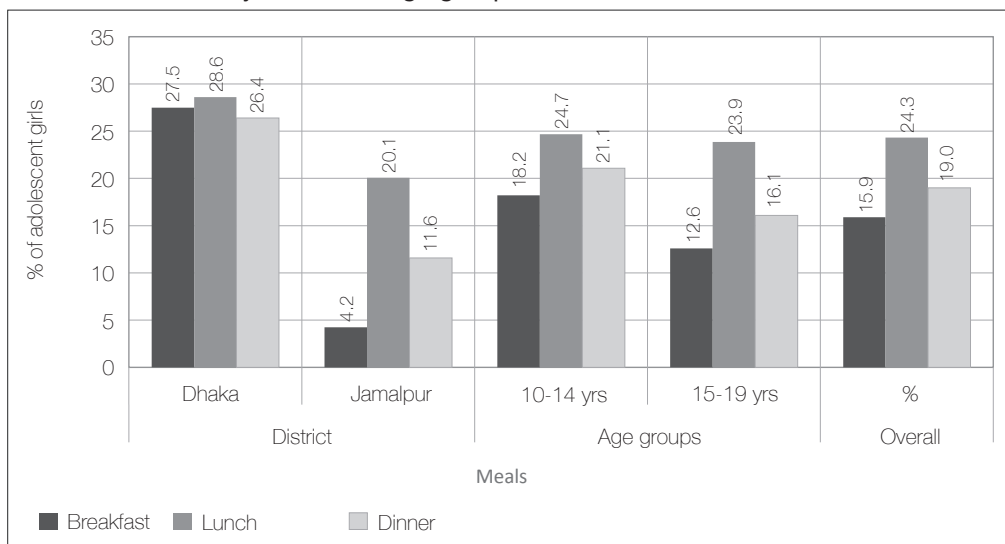


Figure 3.8 shows meal skipping pattern of adolescent girls by type of meals. About 27.5% of adolescent girls from Dhaka skipped breakfast at least once or more in a week which is significantly lower among the girls from Jamalpur (4.2%). Findings also showed that 28.6% adolescent girls in Dhaka and 20.1% adolescent girls in Jamalpur missed their lunch at least once or more per week. The percentage of girls skipped their dinner was 26.4 and 11.6 in Dhaka and Jamalpur, respectively.

**Fig 3.8**  
**Percentage of adolescent girls who skipped breakfast, lunch and dinner at least once or more in a week by areas and age groups**



Findings from qualitative assessment confirmed that meal skipping was very low in Jamalpur compared to Dhaka. In Jamalpur, most commonly skipped meal was lunch whereas in Dhaka breakfast was the most skipped meal. More than half of the mothers reported that their adolescent girls skip meals.

### 3.6.2 Determinants of meal skipping

The determinants of meal skipping were explored during IDIs and FGDs sessions. Almost all respondents identified timing of school as the main reason for skipping breakfasts and lunches among adolescent girls in both areas. According to them, school hour started in early morning so adolescent girls could not manage to have homemade or any breakfast and were unable to take lunch to eat during break time. Moreover, sometimes adolescent girls do not bring tiffin from home as it made their school bag heavy. In addition, sometimes adolescent girls couldn't wake up early in the morning and thus couldn't manage time for taking breakfast.

Many respondents also reported that they did not feel good to eat in such early morning as they feel less appetite and vomiting tendency in that time. One of the respondent stated *“My adolescent sister skips breakfast frequently because she said she don't feel hungry in the morning”*. Some adolescent girls also spend additional time after school hour for private tuition and remain hungry.

In Dhaka, lack of gas for cooking in morning, traffic jam and lack of time of mother to prepare foods for breakfast as well as for tiffin were also common mentioned as reason for skipping breakfast. As most of the mothers are engaged in different works so they cannot make foods in the morning instead they give BDT 10-20 to their daughter for tiffin. Thus, girls also miss the main foods for lunch. One respondent from Dhaka area stated *“Most of the mothers in Dhaka are working mother so sometimes it is not possible for mothers to prepare foods for breakfast or for tiffin. That's why adolescent girls and children come to the shop buy some ready to eat foods such as cake, biscuits, bread/ban, singara etc.”* Sometimes they took late lunch after coming back home from school and sometimes they bought ready to eat foods to eat at tiffin period.

Controlling as important cause for body weight, fight/turmoil with siblings or mothers were identified meal skipping in Jamalpur and also in Dhaka. Adolescent girls skipped meals when become angry or have a fight with someone or have any turmoil with others. Moreover, they also skipped meals when they found that they are getting fatty day by day. Occasionally they skipped meal when they found that the curry was not goes with their choices. Few mothers also reported that adolescent girls sometimes skipped dinner only because of laziness.

### 3.7 DIETARY HABIT DURING MENSTRUATION

Dietary practices during menstruation is an important part of adolescent girls overall dietary habit both from its physiological as well as psychological aspects. Table 3.10 displays that overall 12% girls avoided foods which were mostly animal protein during menstruation. The percentage of adolescent girls refrained animal protein during menstruation was a bit higher in Dhaka (13.8%) than that in Jamalpur (10.7%). Food refraining during menstruation was more common among adolescent girls aged 15-19 years old (15.0%) compared to those aged 10-14 years old (10.3%). Only a few of adolescent girls (3.4%) reported that they added food items such as vegetables, sour foods, milk etc. during this period. Among the adolescent girls who refrained foods during period, 56.4% refrained fish, 23.6% egg, 20.9% rice, 15.5% meat (15.5%) and 17.3% sour foods. Changes in dietary practices to some extent varied by districts and age groups. The most commonly cited causes of food avoidance were: foods were not tasty (49.1%), foods had bad smell (30.0%), lack of appetite (11.8%), suggested by elderly peoples (11.8%) and nausea (10.9%).



**Table 3.10**  
**Percentage of adolescent girls by dietary habit during menstruation according to areas and age groups**

Characteristics	District		Age group		Overall (%) (n=900)
	Dhaka (%) (n=451)	Jamalpur (%) (n=449)	10-14 years (%) (n=527)	15-19 years (%) (n=373)	
Refrained foods during menstruation	13.8	10.7	10.3	15.0	12.2
Added foods during menstruation	4.4	2.5	2.9	4.3	3.4
Types of foods refrained	n= 62	n= 48	n= 54	n= 56	n= 110
Fish	61.3	50.0	66.7	46.4	56.4
Rice	21.0	20.8	18.5	23.2	20.9
Meat	22.6	6.3	22.2	8.9	15.5
Sour foods	21.0	12.5	14.8	19.6	17.3
Egg	17.7	31.3	27.8	19.6	23.6
Causes of refraining	n = 62	n = 48	n = 54	n = 56	n = 110
Not tasty	50.0	47.9	50.0	48.2	49.1
Lack of appetite	14.5	8.3	13.0	10.7	11.8
Feeling bad smell	29.0	31.3	44.4	16.1	30.0
Nausea	11.3	10.4	7.4	14.3	10.9
Elders suggestion	11.3	12.5	13.0	10.7	11.8

Nearly half (24 out of 52) of the adolescent girls who participated in qualitative assessment reported that they made some changes in food intake during menstruation period. Almost all of them said they consumed less amount of food (even of the staple/rice) as they felt less hungry. During this time, the food items that were not consumed were fish, meat, egg, milk, sweets etc. This also confirmed the findings from the quantitative assessment results. The main reasons for refraining those food items were a) unpleasant smell that triggered vomiting, b) forbidden by mothers and elders because those were food '*shorir k dushito kore*', which means these foods poison the body) perception of those foods would cause heavier bleeding as suggested by elders or family members or relatives. Sweets were avoided because they triggered nausea.

This study also identified foods that adolescent girls advised to consume additionally during menstruation. Some of the participants mentioned about increasing intake of sour foods like tamarind, *boroi/kul*, lemon, pickle/*chutney*; dry foods like *chanachur*, puffed rice/*muri* and also cold foods like cold drinks. Increasing consumption

of sour foods such as tamarind, *boroi/kul* and pickle/*chutney* was perceived to improving appetite and comfort feeling. Increasing consumption of dry foods such as like *chanachur*, puffed rice/*muri* and *chira* was perceived to boosting the taste of foods and reducing the frequency of using toilet. Consumption of cold foods made them feeling good. On the other hand, few respondents avoided tamarind during menstruation believing that it could cause heavy bleeding. She said that “*My mother suggest me not to eat sour foods during this time as it may cause heavy bleeding*”.

Only one of respondent mentioned about taking iron tablet as suggested by her mother. This was with understanding that iron tablet would help to recover the blood losses during menstruation. Some of adolescent girls said that they drank more water as they felt thirstier. On the other hand, a few adolescent girls reported that during menstruation they drank less water to avoid frequent urination as it was uncomfortable to use toilet frequently. Overall, adolescent girls were lack of knowledge about menstruation related issues. They did not feel comfortable to talk about this with family members, but rather talked with friends of the same ages.

Most of the mother reported that during menstruation her daughter consumed less amount of food (even rice also) due to less appetite. According to mothers, specific food items that were consumed less during menstruation were fish, meat, egg. Adolescent girls sometimes also skipped meal during their period. Fathers had almost no knowledge or role about food consumption and cares for adolescent girls during menstruation. According to them, mothers should take care of this issue as they (fathers) were not comfortable with their girls regarding talking about menstruation.

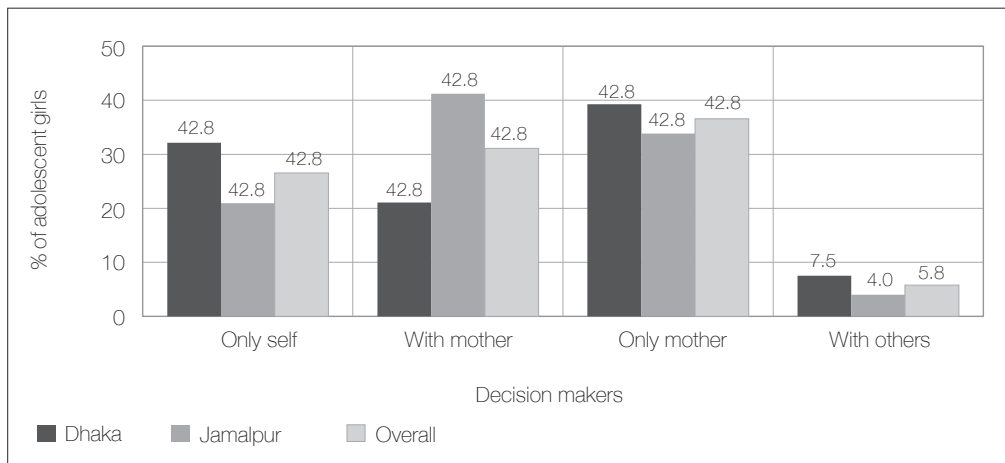
### 3.8 DECISION-MAKING AND INVOLVEMENT IN HOUSEHOLD FOOD MANAGEMENT

Decision about adolescent girls' food consumption and involvement of adolescent girls with households' food purchasing, diet planning and food preparation captured through this research.

#### 3.8.1 Decision-making about adolescent's food consumption

Figure 3.9 indicates that mothers of adolescent girls were the main decision maker regarding adolescent's food consumption. About 39% adolescent girls of Dhaka and 33.9% girls of Jamalpur reported that their mothers alone decided what they should consume. On the other hand, 31% girls said that they and their mothers together make decision about their food consumption where the proportion in Jamalpur is higher than that in Dhaka (41.2% vs. 21.1%). Only 26.6% of the adolescent girls decided independently what they should and shouldn't eat with higher proportion among adolescent girls in Dhaka (32.2%) than those in Jamalpur (20.9%).

**Fig 3.9**  
Decision maker on adolescent's food by areas



**Fig 3.10**  
Decision maker regarding adolescent's food by age groups

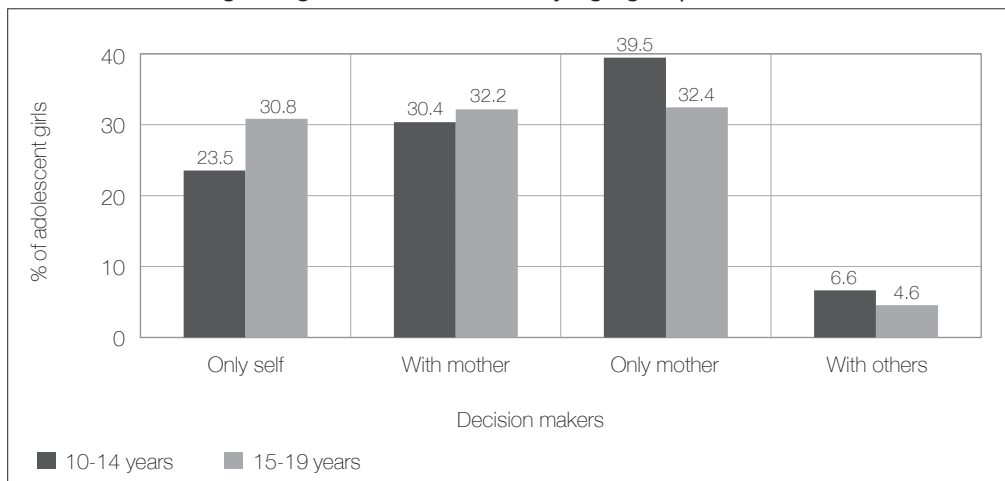


Figure 3.10 displays the distribution of adolescent girls according to their decision maker regarding food consumption by age groups. As usual, mothers have more influence on girls' food consumption on the younger adolescent girls compared to the older ones. In qualitative assessment, most of the mothers mentioned that they considered their girls' choices during food preparation or cooking to ensure that the girls eat properly and did not skip their meal. On the other hand, most of

the adolescent girls reported that they themselves mainly took decision about their own food choices during qualitative exploration. Few girls also mentioned that their mothers had a role in this regards.

Fathers of adolescent girls reported that they considered their daughters' choices during purchasing of affordable foods. *“My daughter is my heart and I always give priority to her choices. I try to buy according to her preferences such as fruits, vegetables, fish, egg and chicken. Sometime she asked for food from outside like jhalmuri, fuchka, chatpati, etc. and I bought it knowing that these foods are not healthy as because I can't ignore her demand. Sometimes I gave money to her to buy these foods by her own”.*

### 3.8.2 Involvement of adolescent girls in household food management

Table 3.11 shows the information on to what extend adolescent girls were involved in food purchasing, diet planning and food preparation at the household level. Regarding food purchasing, overall 22.3% of the respondent girls were involved extensively (considering sum of half, mostly and totally) which was more common among the girls from Dhaka compared to Jamalpur (25.9% vs. 18.7%, respectively) and among older adolescent girls than younger adolescent girls (26.6% vs. 19.6%, respectively). Adolescent girls were more engaged in household's diet planning (44.1%) than in food purchasing (22.3%). There was no significant variation among girls from the two areas. Overall 42.4% of the participants were reported to be involved in household's food preparation and it was not significantly different between the areas but age groups.

**Table 3.11**  
Involvement of adolescent girls regarding food purchasing, diet planning and food preparation

Characteristics	District		Age group		Overall (%) (n=900)
	Dhaka (%) (n=451)	Jamalpur (%) (n=449)	10-14 years (%) (n=527)	15-19 years (%) (n=373)	
Engagement with household's food purchasing					
Never	30.8	51.9	43.5	38.3	41.3
Somewhat	42.6	29.4	36.6	35.1	36.0
Half	12.0	7.8	9.7	10.2	9.9
Mostly	12.6	8.9	9.3	12.9	10.8
Totally	1.3	2.0	0.4	3.5	1.7
Not mentioned	0.7	0.0	0.6	0.0	0.3
Engagement with household's diet planning					

[ Table 3.11 contd... ]

[ ...Table 3.11 contd ]

Characteristics	District		Age group		Overall (%) (n=900)
	Dhaka (%) (n=451)	Jamalpur (%) (n=449)	10-14 years (%) (n=527)	15-19 years (%) (n=373)	
Never	20.0	23.6	25.4	16.6	21.8
Somewhat	36.8	30.7	35.7	31.1	33.8
Half	20.0	22.5	20.7	22.0	21.2
Mostly	19.5	20.0	15.8	25.5	19.8
Totally	3.1	3.1	1.9	4.8	3.1
Not mentioned	0.7	0.0	0.6	0.0	0.3
Engagement with household's food preparation					
Never	16.0	22.7	22.8	14.5	19.3
Somewhat	42.4	33.4	41.0	33.5	37.9
Half	17.5	21.8	18.0	22.0	19.7
Mostly	17.7	18.9	15.0	23.1	18.3
Totally	5.8	3.1	2.7	7.0	4.4
Not mentioned	0.7	0.0	0.6	0.0	0.3

The qualitative findings indicated that irrespective of regions, fathers were mainly responsible for purchasing foods for households whereas mothers were responsible for planning and processing of foods at the household level. Adolescent girls reported that occasionally they also contributed in food preparation and processing. Some adolescent girls said that they regularly contributed in cooking as their mothers were service holder or maid or tailor etc. Adolescent girls from Jamalpur were more engaged in food processing than the girls living in Dhaka.

### 3.9 ADOLESCENTS' PERCEPTIONS ON USING THE DIETARY DIARY

In addition to the study objectives, the present study explored the experiences and perceptions of using the food diary by adolescent girls. For this purpose, information was collected through FGDs with the adolescent girls (n=90) immediately after completion of 7 days food diary by them.

#### Diary completion

Most of the girls (82% or 74 out of 90) completed the diary by themselves after receiving the instructions from research assistants. Those who completed the diary with the help of other person, mostly sought assistance from their friends, classmates and other members of adolescent club. Only one adolescent mentioned about her mother in this regards.

### How was the diary exercise?

Keeping the diary for seven-days and documenting all the information was exciting and useful to most of the respondents as this was a new experience to them. Only few respondents reported it as average or slightly bad experience. When the adolescent girls were elaborating their positive and good feelings about the exercise, one mentioned: *“Documenting whole day food consumption and other activities was a new experience to us and we had enjoyed it a lot. Especially when we see the completed diary with our own information, it was really exciting”*.

According to another respondent: *“I found this exercise excellent, funny and also useful because, firstly, we can see how much time we have spent for which works in the whole day. Secondly, we can find out which foods we have eaten or not in a day. Thirdly, it was like a memory test to us to see how far we can remember at the end of the day about whole day activities and lastly by exercising this we become more conscious about the body weight and our own health also”*.

Among the adolescents who expressed bad and negative feelings about this exercise, they commonly perceived it as an additional activity to them. In the word of one of adolescents who had negative feelings: *“It was a little bit difficult for me to manage additional time after whole day works, school and study. When I have to fill-up the diary after finishing all activities, at that time I feel very tired and it seems an extra pressure to me.”* Another girl stated: *“At the first few days I found it very exciting but after some days I become bored to write all those information repeatedly. Also it was very painful for me to write down when my mood is off”*.

### Challenges during exercise

Documentation of time spending in different daily activities was the most commonly perceived challenge for most of them as they did not have any previous idea regarding this issue. Managing additional time to complete the whole exercise was also reported as another challenge. They found it difficult to accurately report the time spent on the whole day activities though it was become easier after one or two days of exercise.

### The best thing about keeping the dietary diary

The most commonly cited best thing of this exercise was to listing the names of their favorite foods and thus make it known to other people. Other identified enjoyable parts were information on teasing (making fun of body weight), time distribution for whole day activities, mood and turmoil etc. They found it amusing because nobody asked them about these topics before and now they were happy to inform others about their feelings regarding these issues.

### **The worst thing about keeping the dietary diary**

Although most of the respondents found the exercise were exciting, a few of them had a concern about keeping the diary. The major issues were 1) it requires extra time, 2) difficult to fill in the menstruation part and 3) distribution of time among different activities precisely. One of the adolescent girls mentioned: *"Suppose I write in my food diary that currently I am menstruating, then someone find the diary and read it. This will be a shame for me. Usually I share this matter with my classmate or friends and also sometimes with mother only"*.

### **Awareness and understanding on diet after exercising dietary diary**

Almost all the respondents came to a consensus that after using dietary diary they had better understanding that their current dietary habit were not marked the level of what they thought before. They realised the need to improve it. One of the respondents said: *"We know many things about health and nutritious food and we thought we are also practicing this but doing this exercise we came to know that how much we actually are doing is less than we initially thought"*. For example, they found that a) they did not eat meals timely and regularly, even sometimes they skipped meal(s); b) they consumed less nutritious food and more street foods like *futchka*, noodles and *chotpoti* while they supposed to eat sufficient nutritious foods regularly, avoid unhealthy foods, and drink milk and other protein source foods. Regarding drinking water one girl mentioned that: *"After keeping this diary, I noticed that I used to drink less water per day that I thought. Now I become aware of drinking sufficient water and am trying to drink more water a day"*.

Only one respondent said differently: *"There is no change in my food habit because I do not know what we are currently eating is sufficient for us or not. We just recorded what we eat. Only when we have sufficient knowledge about the appropriate dietary practices, then we can decide our practice is right or need some improvement/change"*.

### **Comments and suggestions by adolescent girls to improve the diary**

Though most of the respondent found this exercise enjoyable as well as useful, almost all of them came up with some ideas for further improvement of this diary. They commonly demanded additional suggestive information on the diary about (1) appropriate dietary practices and care during menstruation period, (2) proper eating habit and sufficiency of physical activities to keep body weight perfect, (3) future planning, (4) early marriage and (5) teasing and how they can handle this.

According to one of the respondents: *"We want to know more detail about information on menstruation related issues such as what we should or should not eat during menstruation, what are the consequences of eating less nutritious food during this period, what are the complications and possible solution during this time."*

*We cannot talk about menstruation freely with anyone except some of my close friends but they do not know much about it either. So we need more information about it”.*

Moreover they suggested to ease the time distribution part if possible. The findings indicated that there was a huge knowledge gap about the dietary practices and care during the menstruation period and adolescents were very much interested to know the details. On average, it took 10-15 minutes per day to complete required daily information and all of the adolescent girls worked on diary after completing all other daily activities or before going to sleep.



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## DISCUSSION AND RECOMMENDATIONS

### 4.1 DISCUSSION

Healthy eating practices and behaviours that are consistent with improving, maintaining and enhancing health is an important marker of adolescent nutrition. Meal patterns and food intake are important to track the nutrient intakes and diet quality at individual level (Raine 2005). The aim of the present study was to explore the eating behaviour and related factors among adolescent girls in two districts in Bangladesh. This study portrayed detailed information on the knowledge and perception about healthy diet and care during adolescent period among adolescent girls; food preferences and their determinant factors; habits of purchase of ready-to eat foods by adolescent girls; food consumption and dietary diversity; meal skipping and its determinants; dietary habit during menstruation; and decision-making and involvement in household food management etc. In addition, adolescents' perceptions on using the dietary diary was also revealed through this research.

Adolescent girls have comprehensive knowledge about the healthy and unhealthy foods as well as negative consequences of consumption of these foods. But still their food preferences, purchasing and dietary intake did not fit with their sufficient knowledge. This gap between knowledge and actual practice was also documented in other studies (Kotecha *et al.* 2013). Parents and other respondents had good knowledge about the extra nutritional care of the girls during adolescences too. Interestingly, most of the adolescent girls perceived their body weight as perfect in both Dhaka and Jamalpur district.

It is confirmed by the present study that food preferences by adolescent girls were very much context specific. It was clear that adolescent girls from Jamalpur preferred more nutritious food items compared to girls from Dhaka. Taste of food perceived by adolescent girls followed by appearance, cost and availability of the foods are most important determinant of food consumption according to the present study. Several studies also identified availability of foods as one of the most influential factors in

their food choices (Story *et al.* 2002). As mothers and fathers are responsible for making foods available to adolescents at household level, they can have a profound impact on preferences and, hence, consumption which was also echoed in the present study. Decision-making regarding food is a complex process and varies according to the setting, based on cultural and contextual factors (Daivadanam *et al.* 2015). In our study, mothers are the main decision maker about adolescent girls' food consumption followed by girls themselves.

Our study showed that dietary diversity was higher among rural adolescent girls compared to adolescent girls from urban. Animal source of protein consumption particularly egg, milk/milk products and meat was inadequate among adolescent girls in reference to recommended level in national dietary guideline (Nahar *et al.* 2013). Vegetables and fruits consumption were also found to be very low than the recommended frequency for these foods. Another study about the dietary pattern, nutrient intake, and growth of adolescent girls in urban Bangladesh revealed relatively high proportion of girls did not consume eggs (26%), milk (35%), or dark-green leafy vegetables (20%), which concurs with our findings (Ahmed *et al.* 1998). On the other hand, percentage of adolescent girls consumed soft drinks or commercially produced juices at least once a week was found to be high at 57%. Consumption of junk food was more common in urban areas. Low consumption of fruits, vegetables and animal proteins among adolescents also documented in a number of studies in other context. Our study findings specified that frequency of purchasing ready-to-eat foods were more frequently in urban areas than rural areas which indicated the availability of the foods.

The present study depicted meal skipping pattern among adolescent girls in details. It was found that among adolescent girls, the prevalence of girls who skipped breakfast at least once per week was significantly higher in Dhaka slum (27.5%) areas compared to Jamalpur areas (4.2%). About 49.5% girls from Dhaka and 28.3% from Jamalpur skipped any meal at least one or more times per week. Another study in India found that about 40% girls and 30% boys were missing a meal once or twice a week (Kotecha *et al.* 2013). Like skipping meals, the determinants of meal skipping also very much context specific. In our study timing of school was identified as the main reason for diet skipping specially breakfast in both areas. Other most commonly cited reasons for meal skipping were late wake up in the morning, controlling body weight, fight/turmoil with siblings or mothers and less appetite and vomiting tendency in early morning etc. for both region. Additionally, lack of gas for cooking in morning, traffic jam and lack of time of mother to prepare foods for breakfast as well as for tiffin in Dhaka were also common mentioned as reason for skipping breakfast. Regarding context, reasons for diet skipping vary widely. Such as, fasting or did not have time, ill health, lack of appetite, or disliking the food served were mentioned as reason for diet skipping in another study (Kotecha *et al.* 2013).

## 4.2 RECOMMENDATION AND POLICY IMPLICATIONS

The present study suggested some programmatic and policy recommendations based on the findings as follows:

### **Nutrition counselling**

It was evident that many occasion knowledge about healthy diet was not translated into practice with regard to food choices and preference. Thus, proper nutrition counselling for adolescents as well as their parents is advocated on following issues to translate those knowledge into behaviour, which in turn would result in improved practices in course of time:

- ▶ Healthy diet pattern and lifestyle throughout the life cycle
- ▶ The importance of healthy dietary behaviour in adolescence
- ▶ Dietary gauging and appropriate food intake during menstruation

### **Context specific intervention**

Since dietary behaviour widely varies based on the context, any adolescent nutrition interventions should take into account the context. For example, we found that fresh food items such as fruits and vegetables were highly consumed by the girls of rural areas compared to those from urban slums as they were highly available in rural setting. Therefore, while designing any behaviour change intervention targeting girls of rural areas emphasis should be given on providing knowledge on consuming fresh nutritious food items which are ample in those areas.

### **Advocacy to regulate availability and marketing of unhealthy foods**

Present study identified that girls tend to eat only those ready to eat food items which were available at nearby shops. Thus, it is integral to have regulatory on the availability and marketing of unhealthy ready-to-eat foods through advocacy to policy makers and established coordination with relevant ministries and authorities.

### **Establish evidence-based data on adolescent nutrition**

Information of dietary intake pattern as well as lifestyle of the adolescent girls is extremely scarce in Bangladesh. Therefore, to initiate any large scale interventions to address the malnutrition problem of this vulnerable group, more rigorous and nationally representative research on adolescent nutrition focusing on nutritional status (including micronutrient status), dietary intake, identification of barriers to convert the nutrition knowledge to practice, lifestyle and psychological or emotional issues is of utmost important.

Promoting healthier eating patterns among adolescents requires a multi-faceted approach targeting adolescents, parents, families, schools, and communities. Moreover, eating pattern and factors influencing eating behaviours of adolescents need to be better understood to plan or to develop effective nutrition interventions for improving healthy eating behaviours.

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## ANNEXES

**Table 1A.**

Educational attainment by age group

Characteristics	10-14 years (%) (n=527)	15-19 years (%) (n=373)	Overall % (n=900)
Educational attainment of adolescent girls (%)			
Grade V	35.1	5.4	22.8
Grade VI-IX	64.9	67.6	66.0
SSC and higher	0.0	27.1	11.2

**Table 2A.**

Food preferences by adolescent girls

Sl No.	Food items	District		Age group		Overall (%) (N=900)
		Dhaka (%) (N=451)	Jamalpur (%) (N=449)	10-14 years (%) (N=527)	15-19 years (%) (N=373)	
1	Chicken	43.4	44.8	47.1	40.5	44.3
2	Egg	26.8	56.4	40.4	45.3	42.4
3	Mango	43.5	32.7	40.4	38.3	38.1
4	Big fish	28.8	46.8	37.0	39.4	39.6
5	Milk	21.5	41.2	33.0	30.8	37.3
6	Ice-cream	48.8	15.1	31.3	33.5	32.1
7	<i>Fuchka</i>	46.1	9.8	26.0	31.9	28.4
8	Beef meat	18.4	33.9	25.4	30.0	27.3
9	Noodles	32.8	18.7	25.6	27.4	26.3
10	Leafy vegetables	11.3	35.4	19.9	30.8	24.4
11	<i>Biriani</i>	28.8	16.7	24.3	22.3	23.4
12	<i>Jhalmuri</i>	33.5	10.5	23.3	21.2	22.4

**Table 3A.**

Percentage of purchasing incidence of ready-to-eat food items in last seven days by adolescent girls by areas and age groups

Food items	District		Age group (years)		Overall % (n=900)
	Dhaka (n=451)	Jamalpur (n=440)	10 -14 (n=527)	15 -19 (n=373)	
Bun/bread	6.6	6.3	6.7	6.0	6.5
Biscuit	10.3	24.3	16.6	17.6	16.9
<i>Jhalmuri</i>	29.8	11.8	24.2	15.5	21.3
<i>Chotpoti</i>	6.6	0.8	3.7	4.3	3.9
Pickles	9.5	6.8	8.6	7.5	8.2
Mango	5.2	0.3	3.1	2.5	2.9
<i>Fuchka</i>	11.8	0.9	7.1	5.9	6.7
<i>Chanachur</i>	5.7	28.7	16.0	17.5	16.5
<i>Singara</i>	8.4	9.7	9.4	8.3	9.0
<i>Puri</i>	8.7	2.4	6.7	3.9	5.8
Cake	4.1	12.6	8.3	7.8	8.1
Ice-cream	11.2	13.3	12.2	12.1	12.2
<i>Samucha</i>	7.2	0.4	4.0	3.9	4.0
Chips	7.2	9.5	8.7	7.5	8.3
Chocolate/candy	5.5	12.7	9.3	8.0	8.9
Peanuts	1.1	18.0	8.0	11.2	9.1

**Table 4A.**

Percentage of adolescent girls those who has purchased ready-to-eat food items at least once or more during last seven days by areas and age groups

Food items	District		Age group (years)		Overall % (n=900)
	Dhaka (n=451)	Jamalpur (n=449)	10-14 (n=527)	15-19 (n=373)	
Bun/bread	15.1	14.5	16.9	11.8	14.8
Biscuit	21.7	42.8	35.3	27.9	32.2
<i>Jhalmuri</i>	48.1	22.5	43.3	24.1	35.3
<i>Chotpoti</i>	18.2	2.0	10.6	9.4	10.1
Pickles	18.9	15.1	19.9	12.9	17.0
Mango	12.9	0.9	8.2	5.1	6.9
<i>Fuchka</i>	27.1	2.2	17.5	10.7	14.7
<i>Chanachur</i>	14.0	46.3	31.9	27.6	30.1
<i>Singara</i>	15.3	20.3	20.5	13.9	17.8
<i>Puri</i>	20.4	5.4	16.3	8.0	12.9
Cake	9.5	24.9	18.4	15.6	17.2
Ice-cream	25.1	23.6	27.3	20.1	24.3
<i>Samucha</i>	14.4	1.1	8.4	7.0	7.8
Chips	17.7	21.4	23.3	14.2	19.6
Chocolate/candy	13.8	24.3	22.2	14.5	19.0
Peanuts	3.1	30.1	16.1	17.2	16.6

**Table 5A.**

Percentage of consumption incidence of foods during breakfast in last seven days by adolescent girls by areas and age groups

Sl No.	Food items	District		Age group (years)		Overall (%) (N=900)
		Dhaka (%) (N=451)	Jamalpur (%) (N=449)	10-14 (%) (N=527)	15-19 (%) (N=373)	
1	Rice	39.8	84.4	60.3	64.7	62.1
2	Bun/bread	35.1	10.9	24.5	20.9	23.0
3	Potato	38.6	60.5	49.1	50.1	49.5
4	Egg	21.6	17.9	20.6	18.5	19.7
5	Pulse	16.4	19.8	17.8	18.7	18.1
6	<i>Roti/Parata</i>	10.2	0.4	5.9	4.4	5.3
7	Tea	10.2	0.5	5.7	5.3	5.5
8	Brinjal	4.5	31.5	17.3	19.0	18.0
9	Big-fish	9.5	26.2	17.5	18.2	17.8
10	Leafy vegetables	4.7	22.2	10.9	17.0	13.5
11	Dried fish	1.9	11.2	6.2	6.9	6.5
12	Ladies finger	1.8	12.3	5.9	8.7	7.0

**Table 6A.**

Percentage of consumption incidence of foods during mid-morning snacks in last seven days by adolescent girls by areas and age groups

Sl No.	Food items	District		Age group (years)		Overall (%) (N=900)
		Dhaka (%) (N=451)	Jamalpur (%) (N=449)	10-14 (%) (N=527)	15-19 (%) (N=373)	
1	Rice	9.3	11.9	11.5	9.4	10.6
2	Bun/bread	6.8	5.0	6.7	4.8	5.9
3	Potato	6.2	8.7	7.4	7.5	7.4
4	Biscuit	7.6	10.9	9.7	8.6	9.3
5	<i>Jhalmuri</i>	12.1	4.0	10.6	4.6	8.1
6	Singara	6.1	3.2	5.3	3.6	4.6
7	Ice-cream	5.0	4.1	5.3	3.4	4.5
8	Mango	5.0	13.8	8.1	11.3	9.4
9	<i>Chanacur</i>	2.7	10.3	7.1	5.7	6.5

**Table 7A.**

Percentage of consumption incidence of foods during lunch in last seven days by adolescent girls by areas and age groups

Sl No.	Food items	District		Age group		Overall (%) (N=900)
		Dhaka (%) (N=451)	Jamalpur (%) (N=449)	10-14 (%) (N=527)	15-19 (%) (N=373)	
1	Rice	85.5	86.5	85.1	87.2	86.0
2	Potato	44.8	52.5	46.5	51.6	48.7
3	Egg	12.6	13.9	13.6	12.7	13.2
4	Pulse	31.5	23.6	26.8	28.7	27.6
5	Big-fish	28.8	26.3	27.3	27.9	27.5
6	Small-fish	11.4	10.6	9.7	12.8	11.0
7	Chicken	13.5	8.4	12.0	9.6	11.0
8	Leafy vegetables	14.0	18.7	14.8	18.6	16.4
9	Brinjal	7.9	27.4	16.0	20.0	17.7
10	Dried fish	4.11	11.0	6.9	8.4	7.6

**Table 8A.**

Percentage of consumption incidence of foods during afternoon snacks in last seven days by adolescent girls by areas and age groups

Sl No.	Food items	District		Age group (years)		Overall (%) (N=900)
		Dhaka (%) (N=451)	Jamalpur (%) (N=449)	10-14 (%) (N=527)	15-19 (%) (N=373)	
1	Rice	6.6	12.0	11.3	6.4	9.3
2	Tea	7.0	1.4	3.8	4.7	4.2
3	Potato	4.2	7.7	7.1	4.3	6.0
4	Biscuit	9.8	9.7	9.7	9.8	9.7
5	<i>Jhalmuri</i>	9.4	2.3	7.7	3.3	5.9
6	<i>Puri</i>	5.7	0.7	3.9	2.2	3.2
7	Mango	3.2	6.6	5.0	4.8	4.9
8	<i>Chanacur</i>	3.4	7.9	5.9	5.4	5.7

**Table 9A.**

Percentage of consumption incidence of foods during dinner in last seven days by adolescent girls by areas and age groups

Sl No.	Food items	District		Age group (years)		Overall (%) (N=900)
		Dhaka (%) (N=451)	Jamalpur (%) (N=449)	10-14 (%) (N=527)	15-19 (%) (N=373)	
1	Rice	86.1	92.9	87.8	92.0	89.5
2	Potato	40.8	57.9	47.2	52.4	49.4
3	Egg	13.7	13.8	14.4	12.9	13.8
4	Pulse	30.2	21.5	24.5	27.8	25.9
5	Big-fish	25.8	32.9	28.5	30.6	29.4
6	Small-fish	11.4	10.0	10.5	11.0	10.7
7	Chicken	13.8	9.5	12.0	11.2	11.7
8	Leafy vegetables	11.5	17.8	13.8	15.7	14.6
9	Brinjal	8.6	31.0	18.4	21.7	19.8
10	Dried fish	3.2	10.7	6.26	7.9	7.0
11	Milk	6.4	16.8	9.29	14.8	11.6

**Table 10A.**

Percentage of girls consuming different food items in last seven days by areas and age groups

Categories	District		Age group (years)		Overall (%) (N=900)
	Dhaka (%) (N=451)	Jamalpur (%) (N=449)	10-14 (%) (N=527)	15-19 (%) (N=373)	
Frequency of consuming beef/mutton					
Every day in a week	0.0	0.0	0.0	0.0	0.0
4-6 days in a week	1.1	0.5	1.3	0.0	0.8
1-3 days in a week	33.3	34.7	36.1	31.1	34.0
Never in a week	65.6	64.8	62.6	68.9	65.2
Frequency of consuming chicken					
Every day in a week	0.4	0.0	0.4	0.0	0.2
4-6 days in a week	11.5	8.0	11.4	7.5	9.8
1-3 days in a week	68.1	57.9	63.8	61.9	63.0
Never in a week	20.0	34.1	24.5	30.6	27.0
Frequency of consuming milk					
Every day in a week	0.0	4.0	0.6	4.0	2.0
4-6 days in a week	7.3	10.7	8.2	10.2	9.0
1-3 days in a week	33.9	39.2	37.0	35.9	36.6

[ Table 10A. contd... ]

Exploration of eating behaviours among adolescent girls from two selected districts of Bangladesh

[ ...Table 10A. contd ]

Categories	District		Age group (years)		Overall (%) (N=900)
	Dhaka (%) (N=451)	Jamalpur (%) (N=449)	10-14 (%) (N=527)	15-19 (%) (N=373)	
Never in a week	58.8	46.1	54.3	49.9	52.4
Frequency of consuming yoghurt					
Every day in a week	0.0	0.0	0.0	0.0	0.0
4-6 days in a week	0.0	0.5	0.4	0.0	0.2
1-3 days in a week	6.7	8.0	8.5	5.6	7.3
Never in a week	93.4	91.5	91.1	94.4	92.4
Frequency of consuming yellow-Orange vegetables					
Every day in a week	0.4	0.2	0.2	0.5	0.3
4-6 days in a week	14.6	2.0	10.1	5.9	8.3
1-3 days in a week	53.9	37.4	50.1	39.4	45.7
Never in a week	31.0	60.4	39.7	54.2	45.7
Frequency of consuming beans					
Every day in a week	0.0	0.0	0.0	0.0	0.0
4-6 days in a week	0.0	0.7	0.4	0.3	0.3
1-3 days in a week	7.1	15.6	12.0	10.5	11.3
Never in a week	92.9	83.7	87.7	89.3	88.3
Frequency of consuming lentil/seed					
Every day in a week	8.2	7.4	6.6	9.4	7.8
4-6 days in a week	49.0	42.3	45.0	46.7	45.7
1-3 days in a week	39.0	43.7	43.3	38.6	41.3
Never in a week	3.8	6.7	5.1	5.4	5.2
Frequency of consuming nuts					
Every day in a week	0.0	0.5	0.4	0.0	0.2
4-6 days in a week	0.2	5.6	2.7	3.2	2.9
1-3 days in a week	4.7	28.1	14.4	19.0	16.3
Never in a week	95.1	65.9	82.5	77.8	80.6
Frequency of consuming fruits					
Every day in a week	2.4	6.0	4.2	4.3	4.2
4-6 days in a week	23.3	27.0	25.8	24.1	25.1
1-3 days in a week	53.0	46.8	50.9	48.5	49.9
Never in a week	21.3	20.3	19.2	23.1	20.8

**Table 11A.**

Meal frequency of the adolescent girls

Categories	District		Age group (years)		Overall (%) (N=900)
	Dhaka (%) (N=451)	Jamalpur (%) (N=449)	10-14 (%) (N=527)	15-19 (%) (N=373)	
Mean meal per day (number)	4.0	4.1	4.1	3.9	4.0
Skipping any meal/week					
Never	50.6	71.7	58.6	64.6	61.1
1-2 meal/week	27.1	23.2	26.0	23.9	25.1
3 or more/week	22.4	5.1	15.4	11.5	13.8
Skipping breakfast					
Never	72.5	95.8	81.8	87.4	84.1
1-2 meal/week	24.8	4.0	16.5	11.5	14.4
3 or more/week	2.7	0.2	1.71 <sup>^</sup>	1.1	1.4
Skipping lunch in a week					
Never	71.4	80.0	75.3	76.1	75.7
1-2 meal/week	26.8	19.6	23.0	23.6	23.2
3 or more/week	1.8	0.5	1.7	0.3	1.1
Skipping dinner in a week					
Never	73.6	88.4	78.9	83.9	81.0
1-2 meal/week	25.5	11.4	20.1	16.1	18.4
3 or more/week	0.9	0.2	1.0	0.0	0.6



