

ORIGINAL ARTICLE

Food Intake Pattern of Adolescent Girls of Different Socio-economic Groups in Selected Schools of Dhaka CityReshma Mazumder Shampa¹, Md Shahadat Hossain Khan², Moinuddin Ahmed³, Asma Rubyat⁴**Abstract:**

A cross-sectional study was done on 92 girls of two High Schools in the urban Dhaka with the objective to explore the pattern of food and nutrient intake of adolescent girls in relation to their socio-economic condition. Food intake was recorded by dietary diary for seven days. A total of 92 respondents were motivated to maintain the diary. The methods of seven days intake has purposely chosen to avoid the negative factors associated with 24 hours recall method. Socio-economic class of the respondents was determined by the locations of their schools. The study revealed that a good percentage (48%) of girls took eggs 2-4 times in a week. On the other hand, a larger portion of girls (52%) did not take milk in a week. Majority (77.30%) of the girls took meat 1-4 servings per week and 61% of the girls took fish more than seven servings in a week. Nearly 55% of the girls took green leafy vegetable 0-4 servings in a week. Rice is the main breakfast menu among 44% of the respondents. The study also found that calorie consumption was similar among the girls of two schools but protein intake was less among the girls of Mollartake School. Respondents from Rajuk School were used to take fast food and cold drinks more than those of Mollartake School.

Introduction:

Adolescents belonging to age group 10-19 years constitute almost one fifth of the world's total population¹. In Bangladesh, out of the total female population of 54.5 million, almost 14 million are between 10-19 years of age². Adolescence is a period of life when an

adequate intake of energy and other nutrients in the diet would seem of great importance in order to build up the full potential of an individual³. A girl in a family is often a sufferer of unfair treatment in allocation of food as well as in her other basic needs and amenities such as education and health care facilities⁴. Poor nutritional status of adolescent girls is associated with dietary discrimination. This discrimination may even be evident early in life⁵. In a study conducted by Ahmed et al found that food intake pattern of the girls of Dhaka city tended to be inadequate in respect of both for macronutrients and micronutrients⁶. Proper nutrition at this stage will promote both mental and physical development. Dietary deficiency of calories for this group of the society indicates a loss of stamina, diminished learning capabilities and

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output of work⁷. Dietary habits that are acquired during adolescence have vast impact on the future health status of a woman. Furthermore, practice of a healthy dietary habit of an adolescent girl of today would persuade her to choose and maintain a right diet for her own family in future.

Materials and method:

This study used a cross-sectional design and was conducted in two schools of Dhaka city. One school named Mollartake Udayan High School and College at Dakshin Khan, a semi-urban area outside the Dhaka City Corporation area. The other school was Rajuk Model School and College. The study sites were selected purposively. The purposive selection of the locations of schools helped in dividing the population into two groups - middle class and upper middle class. Samples were selected purposively from the students of class IX to XI and of age group 13-18 years. They were motivated for the study according to their availabilities and willingness to participate. Dietary diary was used as data collection instrument. Dietary diaries having seven diet sheets were distributed among the respondents for maintaining seven days food intake records. They were requested to write down the amount of foods and tick the time of food taken against each food items that were given on diet sheet just after eating. During the seven days procedure they were repeatedly supervised in filling up the forms. Motivation played a major part during the whole process. Serving cups and spoons were distributed among the respondents to get nearest possible approximation of serving size of food consumed. The serving weights of different food items were then calculated. Equivalent raw food weight was also calculated using a

conversion table for Bangladeshi food formulated at the Institute of Nutrition and Food Science⁸. Weight of each food item was estimated in grams and recorded in the master sheet. Total amount of protein, fat and carbohydrate were obtained from each dietary diary. The amount of protein, fat and carbohydrate in each food items were estimated from food composition table⁹. The amount of calorie intake from protein, fat, carbohydrate and total calorie intake were assessed. Finally, average intake of seven days was calculated from each dietary diary. Data analysis was done by the software SPSS Win and tested with appropriate test of significance.

Results:

Food intake pattern:

The mean intake of egg, milk, meat, and fish were 4.97, 5.37, 2.31 and 3.36 times per week. The type of fish intake was obtained from the dietary diary and showed that mean intake of small and large fish were 2.06 and 2.13 times per week. The mean intake of green leafy vegetables, fruits, fast food, cold drinks was 4.32, 4.64, 3.54 and 4.76 servings per week (Table-I).

Table-I: Food intake pattern.

Types of food	Mean	Median	± SD
Eggs	4.97	5.00	± 2.18
Milk	5.37	4.00	± 4.11
Meat	2.31	2.00	± 1.69
Fish (total)	3.36	3.00	± 1.36
Small fish	2.06	2.00	± 1.02
Large fish	2.13	1.00	± 1.71
Sweet pumpkin	1.96	2.00	± 2.04
Green leafy vegetables	4.32	4.00	± 2.26
Fruits	4.64	4.00	± 2.00
Fast food	3.54	4.00	± 2.22
Cold drinks	4.76	4.00	± 3.67

A good percentage (48%) of girls took eggs 2-4 times per week (Fig.-1); about 52% of the girls did not take milk in a week (Fig.-2). Nearly 77.30% of the girls took meat 1-4 servings in a week (Fig.-3). About 37% of the girls took fish 1-3 servings per week and 61% of the respondents took fish more than seven servings in a week (Fig.-4).

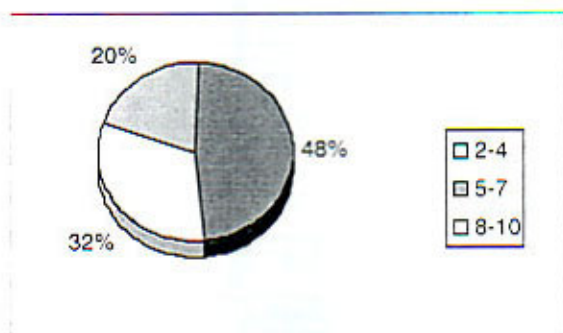


Fig.-1: Consumption frequencies of eggs by the respondents.

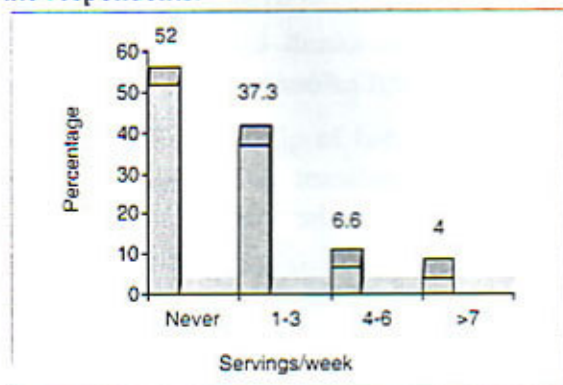


Fig.-2: Milk intake pattern of the respondents.

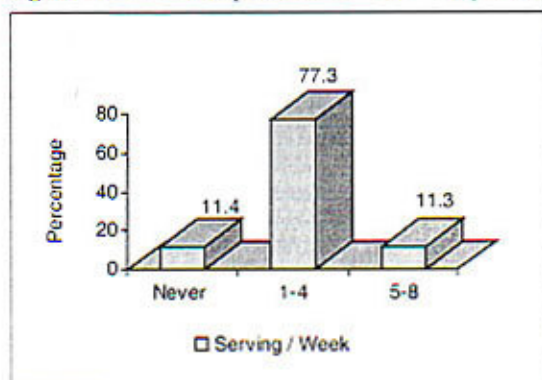


Fig.-3: Meat intake pattern of the respondents.

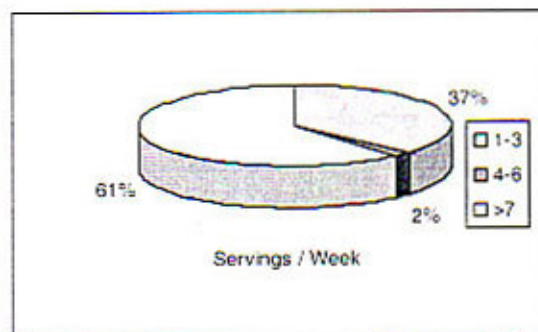


Fig.-4: Consumption of fish.

About 55% of the respondents took green leafy vegetables 0-4 servings per week (Fig.-5).

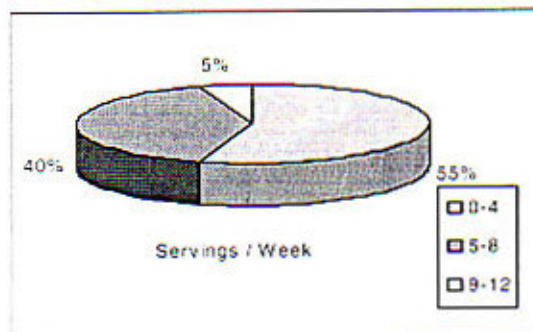


Fig.-5: Green leafy vegetable consumption by the respondents.

Breakfast menu of the respondents:

Seven days dietary diary recorded the various types of breakfast menu of the respondents. Of them 44% of the respondents took rice as their breakfast menu (Table-II).

Table-II: Breakfast menu of the respondents

Menu	Frequency	%
Rice	40	44.00
Rotti / Bhaji	10	10.00
Rotti/Halowa/Paish	05	5.44
Porota	08	8.69
Bread / Jelly / Butter	05	5.44
Khichuri	06	6.53
Sweets	05	5.43
Fried rice	06	6.53
Flatted rice	05	5.43
Puffed rice	02	2.17

Nutrient intake pattern of the respondents:

The mean protein, fat and carbohydrate intake were 48.89, 36.89 and 283.77 gm/day respectively. Of the micronutrients, mean intake of iron was 17.10 mg per week. Intake of Vitamin C, Vitamin B₁ and Vitamin B₂ were 38.10, 1.6654 and 0.7055 gm per week respectively (Table-III).

Table-III: Nutrient Intake of the respondents

Nutrient Intake	Mean	Median	± SD
Total Calorie (Kcal)	1629	1578	204
Protein (gm)	48.89	46.95	5.630
Fat (gm)	36.89	36.22	5.15
CHO (gm)	283.77	278.20	51.11
Iron (mg)	17.10	16.48	1.80
Vit-C (gm)	38.10	37.67	8.12
Vit-B ₁ (gm)	1.6654	1.5300	.3039
Vit-B ₂ (gm)	.7055	.6800	.1369
Calcium (gm)	360.348	365.05	65.95
Vit-A (ug)	960	366	1492

Table-IV: Mean intake of calorie, protein and fat as percentage RDA by the median age group of the respondents

Substance	RDA	Intake	%
Calorie (Kcal)	2260	1629	72%
Protein (gm)	47	48	99%
Fat (gm)	50	39	72%

Relationship of schools with nutrient intake pattern:

No significant difference was observed between the mean calorie consumption among the respondents of the two schools ($t=-.886$, $p=NS$), whereas the mean carbohydrate consumption was more among the girls of Mollartake school

than Rajuk school ($t=2.284$, $p<0.05$) (Table-VI). There were significant difference in mean protein intake between the respondents of two schools ($t=2.060$, $p<0.05$) (Table-V).

Table-V: Group 't' test for protein (gm) intake in two schools

Schools	N	Mean	± SD	t-value	df	P-value
Mollartake Udayan School & College	53	47.83	5.38	-2.060	76.51	0.043
Rajuk Utara Model School & College	38	50.29	5.76			

Table-VI: Group 't' for total CHO intake in two schools.

Schools	N	Mean	± SD	t-value	df	P-value
Mollartake Udayan School & College	53	297.4579	56.65	-2.284	66.438	0.026
Rajuk Utara Model School & College	38	272.4191	43.4961			

Relationship of food intake with schools of the respondents:

There was significant difference ($\chi^2=23.68$, $p<0.05$) between the respondents of two schools in intake of rice as breakfast menu. There was significant difference ($\chi^2=6.37$, $p<0.05$) in consumption of meat in a week. Significant difference was also found in frequencies of fish intake among the respondents of two schools ($\chi^2=13.52$, $p<0.5$) (Tables - VII and VIII)

Table-VII: Relationship of rice as menu at breakfast with schools of the respondents.

	Mollartake Udayan School & College		Rajuk Utara Model School & College		Total	
	N	%	N	%	N	%
Rice as breakfast menu	30	60	10	24	40	44
Other than rice	20	40	32	76	52	56
Total	50	100	42	100	92	100

Table-VIII: Relationship of meat intake with schools of the respondents

Meat intake	Mollartake Udayan School & College		Rajuk Uttara Model School & College		Total	
	N	%	N	%	N	%
0 servings/week	30	60	14	34	44	48
>4 servings/week	20	40	28	66	48	52
Total	50	100	42	100	92	100

Nearly 57% of the respondents did not take fast food in a week. Of them 78% were from the Mollartake School and College and 33% were from Rajuk Uttara Model School and College. There was significant difference ($\chi^2=18.63$, $p<0.05$) between fast food consumption with schools of the respondents. Similar difference was found in cold drinks intake among the girls. There was significant difference ($\chi^2=29.03$, $p<0.05$) between frequencies of cold drinks intake with the respondents of two schools (Tables- XI and X)

Table-IX: Relationship of fast food intake in two schools.

Fast Food intake	Mollartake Udayan School and College		Rajuk Uttara Model School and College		Total	
	N	%	N	%	N	%
Never / week	39	78	14	33	53	57
> 2 / week	11	22	24	67	39	43
Total	50	100	42	100	92	100

Table-X: Relationship of cold drinks intake in the respondents of two schools

Cold drinks intake	Mollartake Udayan School and College		Rajuk Uttara Model School and College		Total	
	N	%	N	%	N	%
0-4 times/ week	40	80	10	24	50	54
> 5 per week	10	20	32	76	42	42
Total	50	100	42	100	92	100

Discussion:

This study was designed with the objective of identifying the food and nutrient intake pattern of the adolescent school girls in different socio-economic groups. The important part of the study dealt with the maintaining of self reported dietary diary by the respondents for seven days. The girls were motivated with regard to obtaining approximately actual picture of their dietary pattern in a week. The mean energy intake of the girls was found to be 1629 kcal/day which was less than the daily energy requirement for this age group in this country¹⁰. A Study by Zereen et al revealed that the mean energy intake of the adolescent girls was 1465 kcal/day², which was less than the mean energy intake revealed by the present study. The study also found that protein intake was higher than the Recommended Dietary Allowance (RDA) value, while carbohydrate and fat intake were below the RDA values. Iron and calcium which are very essential elements for this age group were found to be taken in lesser amount than the normal RDA value. This would naturally affect the health of the girls in the future during maintaining reproductive performance. Data on dietary pattern showed that a good percentage of girls took rice as breakfast menu. The national nutrition survey conducted in 1981-82 showed that the average food intake was 765 g raw food/capita of which 60% was rice, 30% vegetable and 6% animal fat. In terms of energy, over 80% of the total energy intake came from rice. This means that rice is the major source of energy as well as nutrients. However, some essential nutrients such as Vitamin A, Vitamin C, Iron, Calcium and Zinc are not found in rice at all, or are found only in small quantities^{11,12}.

Several studies showed significant association of socio-economic factors with the nutritional

status and dietary intake in different population groups.^{11,13} Present study also explored relationship of the schools of the respondents with food intake pattern. Majority of the respondents of Mollartake School were from middle class families and majority of Rajuk School were from upper and upper middle class families. The respondents from Mollartake School took usually rice as their breakfast menu than the respondents of Rajuk School. This was, may be, due to the traditional eating habit in their family or may be due to economic limitation. The consumption of meat and fish by the respondents from Mollartake School was significantly less than that of Rajuk School. Regarding the intake of fast food and cold drinks, there was significant difference between the respondents of two schools. Girls from Rajuk School took more fast food and cold drinks than from Mollartake School. As fast foods are comparatively expensive, frequent consumption of these foods by the students of Rajuk School reflects their better economic condition. The study included a small sample size, so it was not representative of urban adolescent school girls of the entire nation. In future, broad based research is required in a large scale including both male and female urban adolescents to know more detailed information about the food intake pattern of the adolescents of different socio-economic groups.

References:

1. Ali SMK, Nahar N, Islam K, *et al.* Availability of nutrients for adolescent girls. *Bang J Nutr* 1994; 7: 13-17.
2. Zareen M, Ahmed F, Khan MR, *et al.* Dietary pattern, nutrient intake and growth of adolescent schools girls in urban Bangladesh. *Public Health Nutr J* 1998; 1: 83-91.
3. Report of a WHO Expert Committee. Nutrition in Adolescence. WHO technical report series, No. 377. Geneva: WHO, 1967.
4. Sarwar H. Economic implication of malnutrition in Bangladesh. *J Nutr* 1992; 5: 15-20.
5. Selina M. Nutrition status of girls aged 17-24 years resident of college hostel (Dissertation). Dhaka, Bangladesh: University of Dhaka, 1995. pp-24-26.
6. Ahmed F, Shaheen N, Barna S, *et al.* Studies on the dietary pattern of urban school children in Dhaka. *Bang J Nutri* 1990; 3: 91-97.
7. Ahmed K, Hasan N. Nutritional survey of rural Bangladesh. *Bang J Nutri* 1992; 4: 32-35.
8. Ali SMK, Pramanik MMA. Conversion factors and dietary calculations. Institute of Nutrition and Food Science 1991. University of Dhaka, Bangladesh. pp- 22-24.
9. Ahmed K. On nutrition policy. *Bang J Nutri* 1992; 5: 21-26.
10. Sultana N. Nutritional status of adolescent school girls in a rural area (Dissertation). Dhaka, Bangladesh: University of Dhaka, 1985. pp- 40-48.
11. Roxton CH, Kirk TK, Betton NR, *et al.* Relationship between social class, nutrient intake and dietary pattern in Edinburgh school children. *Int J Food Science Nutr* 1997; 48: 4.
12. Nagi M, Schawh L, Shamma S. A study on the nutritional status of adolescent girls. *American J Diet Association* 1995; 47: 201-9.
13. Henry FJ, Brined A, Fauveau V, *et al.* Risk factors for clinical marasmus: A case control study of Bangladeshi children. *Int J Epidemiol* 1993; 22: 65-73.