

Availability of Nutrients for Adolescent Girls

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Introduction

The period adolescence, accompanied by its profound changes in growth rate, body composition and marked physiologic and endocrine changes, is a time of life when the individual is at particular nutritional risk. There are three substages of adolescent⁽¹⁾. These are as follows :

- (a) Early adolescence (10/11-13/14),
- (b) Mid adolescence (14/15-16/17) and
- (c) Late adolescence (17/18-20 years).

Nutrition in total life and infancy is reflected in the health and mortality in early life. This is linked with the subsequent development, survival and health in adulthood. Numerous studies showed that maternal nutrition are positively correlated with the infant birth weight⁽²⁾. Poor nutritional status of adolescent girl is associated with dietary discrimination. This discrimination may even be evident early in life. The unfortunate state of affairs depicted above is not only due to the scarcity of food, but also due to the acarcity of food, but also due to the lack of knowledge on 'what to eat' and 'how to eat' in order to maintain an optimum state of health.

Adolescence is not only a period of dynamic growth but they have also inadequate and improper dietary habits⁽³⁾, which causes added stress to

teenage pregnancy make it a high risk group for nutritional deficiency disorder. High maternal mortality, prematurity, abortion and neonatal deaths are related to pregnancy among the 16-17 years age group⁽⁴⁾. Failure to meet the nutritional requirements during adolescence for girls will have a bearing on maternal nutrition and on the offspring. In our country mothers of tomorrow are nutritionally deprived first in parents house then in their husbands house, as women eats after male, who consume of nutritious part of the family food. The food she get is nutritionally unsound and imbalance making her vulnerable to disease and death⁽⁵⁾.

The assessment of their nutritional status is a relevant prerequisite to ensure not only healthy adolescence but also healthy motherhood accompanied with education in perinatal mortality rate. The present study is an attempt to findout the nutrients availability to adolescent girls of Bangladesh. Anthropometry and food consumption survery were used to collect information. The standard RDA used here was UCMR's.

Materials and Methods

The study is cross-sectional and divided into two components, namely dietary and anthropometric survery.

Selection of sample

Sideswari women college, Dhaka Central girls high school and Bangla Bazar high school in Dhaka city were selected purposively. A sample was drawn allowing standard error 5 percent using $p=0.5$ and with 95 percent confidence limit. Thus the sample was estimated to 152 by using the sampling methods of PPS (probability proportion to sample size).

Survey components : The consumption pattern was measured by 24 hours dietary recall methods. Original weight, dressed weight, boiled weight, cooked weight, fried weight and weight of edible part of the same food item were also noted. Weighing scale, Standard cup, bati, pot and spoon were items were used for dietary survey. Weight of different states of food items were converted in gram, weight of edible part of food items were estimated by using conversion factors⁽⁶⁾. Nutrients value of food items were calculated by using standard conversion factors(6,7,8). Reliability and Validity test was done by taking 7 days dietary recall of 10 percent of adolescent girls. The results adjusted according to the quality test and presented in the result section. The anthropometric measurements were height and weight. A suitable programme was developed to analysis the data. After necessary coding and editing, the collected data was analyzed by using Computer with the helps of SPSS and Harvard graphics. The output was then presented mostly in tabular form on the basis of frequency distribution.

FIG 1 present the age distribution of the study adolescent girls. The average age of the study subject predicted to 15.05 ± 1.13 . Lowest to highest limit of age found to be 13-17 years.

Table 1 Compares the average weight and height of 152 adolescent girls with standard value. Average weight and height of 13-14 yrs adolescent girls were found to be 44 kg and 152 cm which were 96% and 97% of standard values.

Average weight and height of 15-17 yrs adolescent girls were found to be 46 kg and 154 cm which were 84% and 94% the desirable value respectively.

Table 2 shows the average intake of calorie, protein, fat and CHO of adolescent girls by age groups. Average intake of calorie, protein, fat and CHO were 1663 Kcal, 60g, 24g and 299g against the RDA 2200 Kcal, 46 gm, 50 gm and 350 gm by 13-14 yrs adolescent girls respectively.

Average intake of calorie, protein, fat and CHO were 1721 Kcal, 63 gm, 26 gm, and 310 gm against the RDA 2100 Kcal, 46 gm, 50 gm and 350 gm by 15-17 yrs adolescent girls respectively.

Table 3 shows the average intake of fat soluble vitamins, water soluble vitamins and minerals of adolescent girls by age groups of 13-14 yrs girls. Average intake of vit. C, Vit B₁ and Vit. B₂ were 64 mg, 1.4 mg and 1.0 mg against the RDA 50 mg, 1.1 mg and 1.3 mg respectively. Average intake of Vit. A, iron, Mg, and Zinc were 598 mg, 841 mg, 21 mg, 165 mg and 7.2 mg against the RDA 1200 mg, 1200 mg, 18 mg, 300 mg, and 15 mg

respectively. Average intake of vit A was 5260 IU against the RDA 5443 IU of 13-14 yrs girls. Average intake of vit C, vit B₁ and vit B₂ were 66 mg, 1.5 mg and 1.1 mg against the RDA 60 mg, 1.1 mg and 1.3 mg respectively. Average intake of Calcium, P, Iron, Mg, and Zinc were 619 mg, 870 mg, 22 mg, 170 mg, and 7.4 mg against the RDA 1200 mg, 1200 mg, 18 mg, 300 mg and 15 mg respectively.

Table 1 : Average weight (kg) and height (cm) of the adolescent girls by age groups

Age group in year		Wight in mg.	Height in cm.
13-11 yrs (n=55)	Obseved	44	157
	Standard ⁹	46	157
	% of standard	96	97
15-17 (n=97)	Observed	46	154
	Standard ⁹	55	163
	% of Standard	84	94

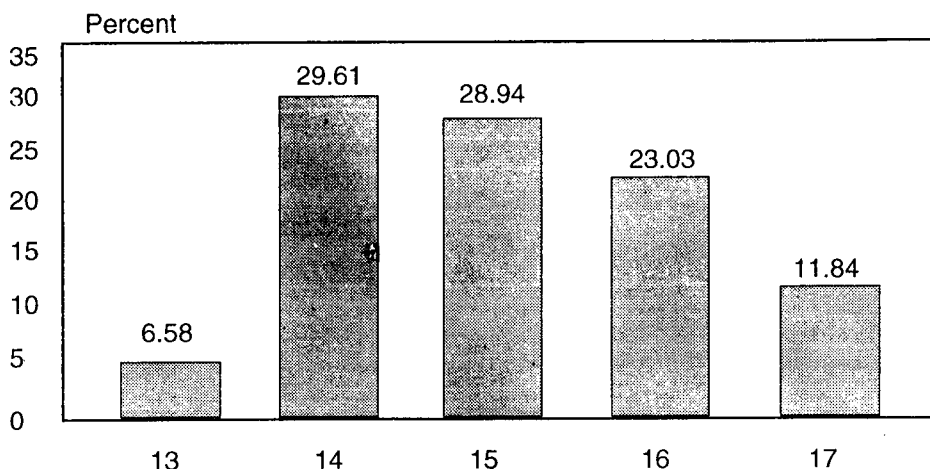
Table 2 : Average intake of calorie, protein, fat and CHO of adolescent girls by age groups.

Age in year	Intake RDA	Calorie Kcal.	Protein gm.	Fat gm.	CHO gm.
13-14	Intake	1663	60	24	299
	RDA ^{2,9}	2200	46	50	350
	% of RDA	76	130	48	84
15-17	Intake	1721	63	26	310
	RDA ^{2,9}	2100	46	50	250
	% of RDA	82	136	52	89

Table 3 : Intake of fat soluble, water soluble vitamins and minerals of adolescent girls by age groups

Age in year		Vit. A IU	Vit.C mg.	Vit.B1 mg.	Vit.B2. mg.	Cal. mg.	P mg.	Iron mg.	Mg. mg.	Zinc mg.
13-14	Intake	5260	64	1.4	1.0	598	841	21	165	7.1
	RDA	4000	50	1.1	1.3	1200	1200	18	300	15
	% of RDA	131	128	127	77	50	70	116	55	47
15-17	Intake	5443	66	1.5	1.1	619	870	22	170	7.4
	RDA	4000	60	1.1	1.3	1200	1200	18	300	17
	% of RDA	136	110	136	85	52	73	122	57	49

Fig. 1 : Age distribution of the study adolescent girls



Discussion:

One Hundred and fifty two adolescent girls were studied. It was observed that average weight and height were 96% and 97% of the standard weight and height by 13-14 yrs girls respectively in the case of 15-17 yrs girls the average weight and height were 84% and 94% of the standard weight and height respectively.

Average intake of energy of 13-14 yrs and 15-17 yrs adolescent girls were 76% and 82% of the RDA. These were below the recommended allowance. Intake of Protein was 130% by 13-14 yrs girls with similar result was found in the case of 15-17 yrs girls. The calorie consumption were 76 and 82 percent with a glaring deficit in the intake of fat. Only 48% fulfilled of the RDA by 13-14 yrs girls with similar situation was found in the case of 15-17 yrs girls.

The reasons for under weight and less height is clearly due to consumption of less fat and calorie. Since this study was conducted during monsoon when available of fish protein is high so there is good intake of protein. Moreover this girls are mostly from higher socio-economic class.

Average intake Vit.A, Vit.C, Vit. B1 and iron were over and above the RDA. Intake of Vit. B2, Calcium, Phosphorus and Magnesium were 77% 50% 70% and 55% of the RDA respectively. Similar were found in case of 15-17 yrs adolescent girls. Intake of zinc was not adequate. It was only 47% of RDA by 13-14 yrs girls. Almost similar result was found in the case of 15-17 yrs adolescent girls. The reason for less availability of micronutrient may be due to lack of nutrition education and also personal liking and disliking of the food item rich in micronutrients.

It may be concluded that Bangladeshi adolescent girls are lighter and shorter due to consumption of less calorie, fat and certain vitamin and minerals. It may be due to lack of nutrition education.

Summary

A total of 152 adolescent girls were studied. Average weight and height were not satisfactory when compared with

the desirable weight and height respectively. Average intake of protein, vit A, Vit C, Vit B₁ and iron were above the recommended allowances. Average intake of calorie, fat, CHO, vit. B₂, calcium, phosphorus, magnesium and zinc were below the recommended allowances. All these are due to lack of nutrition education.

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