Nutritional Scenario of Adolescent Boys in Dhaka University Campus

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Abstract

A cross sectional study was carried out among the adolescent boys (11-15 years) in two selective schools (University Laboratory School and Udoyan School) in Dhaka University campus to investigate the nutritional and health status as well as socio-economic condition. Nutritional status was determined anthropometrically and biochemically (hemoglobin estimation). According to the body mass index, two-third of the boys (75.7%) were normal, 15.4% were over-weight and only 8.9% were found to be thinner. The percent prevalence of anemia was 7.1% based on WHO criteria and the mean hemoglobin level was 14.35 g/dl (±1.38). Energy intake of the boys aged 11-12 years met 79.31% of RDA and those of 13-15 years met 76.09% of RDA. Protein intake of all the boys was more than RDA. Dietary intake of vitamin A was more than 90% of RDA. and that for thiamin and niacin was more than RDA. Iron intake was 60.4% and 66.45% of RDA for the two groups of boys. Vitamin C intake was inadequate (46.76% and 36.06% RDA) for the respective group of boys. Nutritional status (anthropometric) is directly associated with expenditure on food. Percentage of thinness decreased as expenditure on food increased. Monthly expenditure on food had significant relation with hemoglobin level of the adolescents. Most of the participants (67.5%) did not suffer from any disease. Rest of the boys suffered from fever (23.6%), diarrhea (10.9%), common cold (29.1%), respiratory infection (9.1%), measles (3.6%), typhoid (5.5%) and others (18.2%).

Key words: Adolescent boys, Nutritional status, Dhaka University Campus School.

Introduction:

Adolescence is the period from childhood to adulthood. It is the period of life between 10-19 years of age and is characterized by dramatic change in physical, biochemical and emotional development. Growth spurt during adolescence varies in intensity and duration for individual due to several factors such as heredity, environment, socio-economic status, illness and nutritional status in childhood[1]. The health status and needs of adolescents have until recently been largely neglected. With improvements of under five mortality, world attention is now shifted to the health of school aged children

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as well as adolescents. In developing countries these children are malnourished, anaemic and have infectious and parasitic disease burdens that hamper growth and development. The major work[2,3] in the field of adolescent nutrition in developing countries was carried out in eleven countries under the co-ordination of the International Center for Research on Woman (ICRW). Stunting was highly prevalent in nine of the ICRW studies. Thinness was highly prevalent in only three of the countries studied. Adolescents in developing countries join the work force, get married and become pregnant early[4]. In addition to growth retardation, iron deficiency anaemia is also a well-recognized problem for adolescent worldwide.

Adolescents are prone to develop iron deficiency anaemia because of menarche and rapid growth. It has been estimated from a review of 39 studies[5] that 27% of adolescents are anaemic in developing countries and 6% are anaemic in developed countries. More recent work[6] identifies anaemia as the greatest nutritional problem for adolescent in four out of a unique opportunity for the schools to promote and improve the health of the students by instructing them the principles of healthful living by appraising their health status.

Methodology

Study design: A cross sectional study was conducted on the adolescent boys of schools within Dhaka University campus. Selected schools were University Laboratory School and Udoyon School.

Study population: Students were briefed about the study. Boys (11-15 years) who were interested were selected for this purpose. Each of the selected students was handed a letter seeking permission of the guardian to include their children in the study. One hundred and sixty nine adolescent boys were selected randomly.

The questionnaire: In order to obtain relevant socio-economic data, personal characteristics and general health information, a standard questionnaire was developed. Dietary intake was recorded by "24 hour" recall method. The questionnaire was pretested before finalization. The data and specimen was collected during school hours in school premises. Part of the questionnaire (part one) was filled up by the parents for socio-economic information. Rest of the data (part two) was collected by interviewing the subjects.

Blood collection: Blood was collected through finger prick. Hemoglobin levels were estimated by cyanmethemoglobin method[7,8] using a commercially available kit (Boehringner, Manheim, Germany).

Anthropometric measurement: Height and weight of the subjects were measured by standard scale (Detecto-Medic, Detecto scales INC, USA). The Body Mass Index (BMI) was calculated from the body weight of the subjects using the formula:

$$BMI = (Weight\ of\ the\ subject\ in\ Kg \div Height\ of\ the\ subject\ in\ meter^2)$$

Results

The study was carried out in two schools within Dhaka University Campus. Majority of the students (59.8%) were from University Laboratory School and 40.2% of the boys were student of Udoyon School. Characteristics of the boys as shown in Table 1

Table 1. Characteristics of the study population

Parameters	Percentage
School	
Udoyan	40.2
University Laboratory School	59.8
Age	
11-12 years	31
13-15 years	69
Classes	
Class VII	29
Class VIII	46
Class IX	25

Table 2. Percent distribution of the study participants by their Father's occupation

Professions	Number	Percentage
Teacher / Officer / Doctor / Engineer	75	44.4
Employee / Service	46	27.2
Business	45	26.6
Not applicable	3	1.8

Table 3. Percent distribution of the study participants by their Mother's occupation

Professions	Number (n=)	Percentage
Teacher / Officer / Doctor / Engineer	31	18.3
Employee / Service	8	4.7
Business	3	1.8
House wife	127	75.1

Table 4. Percent distribution of the study participants by the Family Monthly Expenditure on food.

Expenditure (Taka)	Number	Percentage
<5000	36	21.3
5000-7499	82	48.5
7500-9999	32	18.9
>10000	19	11.2

Table 5. Percent distribution of the study population by nutritional status.(BMI)

Nutritional status	Number	Percentage
Thinness	15	8.9
Normal	128	75.7
Over weight	26	15.4

Table 6. Hemoglobin level of the study participants by their age groups.

Age groups	Hemoglobin (gm/dl)				
	Mean	±SD	Median	Minimum	Maximum
11-12 years	14.45	1.31	14039	10.49	17.16
13-15 years	14.31	1.41	14.36	11.19	18.08

Table 7. Percent distribution of the study participants according to their type of diseases.

Type of diseases	Number	Percentage
Fever	13	23.6
Cold fever	16	29.1
Diarhoea	6	10.9
Respiratory infectious diseases	5	9.1
Measles	2	3.6
Typhoid	3	5.5
Others	16	18.2

Table 8. Comparison of daily food intake between age group (11-12) & (13-15) years with meeting of RDA%

Nutrients	Age 11–12 years				Age 13–15 years			
	Mean	±SD	RDA	Meetin g% of RDA	Mean	±SD	RDA	Meetin g% of RDA
Calorie (Kcal)	1561.8	258.37	1969	79.31	1635.98	313.94	2150	76.09
Protein (gm)	42.12	12.70	41.5	101.49	45.36	14.18	44.2	102.62
Fat(gm)	325.74	430.01	650	50.11	322.87	14.65	22	99.64
Ca(mg)	11.80	4.25	24	49.17	11.94	5.68	29	41.17
VitA(ngm)	539.38	738.90	600	89.90	827.68	2325.24	600	137.95
Thiamin(mg)	1.04	.21	1.00	103.48	1.07	0.26	1.073	99.72
Riboflaving(mg)	0.63	0.62	1.20	52.5	0.65	0.66	1.29	50.39
Niacin(mg)	14.71	2.02	13.3	110.60	15.92	2.46	14.17	112.35
Vit–C(mg)	23.38	19.75	50	46.76	18.03	15.01	50	36.06

indicate that 31% of the boys belong to the age group 11-12 years and 69% were in the age group 13-15 years. Regarding the classes attending in school most of the students (46%) were in class VIII. On the other hand, the boys in class VII and class IX were 29% and 25% respectively. A significant number (44.4%) of the participant's father were high officials (Teacher/Officer/ Doctor/Engineer). Similar proportion of the fathers were other service holder (27.2%) and businessman (26.6%). Table 3. represents the occupation of the mothers of the participants. Two-third (75.1%) of the mothers were house wife, whereas 18.3% were high officials and 4.7% were other service holder. Only 3 mothers

were involved in business. Table 4. depicts that monthly expenditure on food for about half (48.5%) of the families studied were between Tk. 5000/-7499/. On the other hand 21.3% families spent less than Tk.5000/- and 18.9% spent Tk.7500/-9999/ per month. Monthly expenditure on food Tk. 10,000/- was only for 9 families (11.2%). Nutritional status of the adolescent boys (Table 5.) indicates that two-third (75.7%) of the boys were nutritionally sound anthropometrically having normal BMI according to age. Prevalence of over weight (15.4%) was more than the prevalence of thinness (8.9%). Median value of hemoglobin (Table 6.) for the boys of 11-12 years and 13-15 years was 14.39 g/dl and 14.36g/dl respectively. Only 7.1% boys were anemic (hemoglobin level below cut off point). Morbidity rate was 32% (Table 7). The boys suffered from fever (23.6%), cold and fever (29.1%), diarrhea (10.9%), respiratory infectious disease (9.1%), measles (3.6%) and typhoid (5.5%) and others (18.2%). Table 8. represents the mean dietary intake of two groups of adolescent boys aged 11-12 years and 13-15 years respectively. The mean energy intake for the two groups were 1561.8 Kcal and 1635.98 Kcal which met 79.31% and 76.09% of the recommended allowance. The mean protein intake was 42.12g and 45.3g which was more than the requirement (RDA). Intake of fat which may be considered as the reflection of economic condition was satisfactory (93% and 99.66% of RDA). Regarding micronutrients, dietary intake of thiamin and niacin was more than RDA and that for vitamin A was more than 90% of RDA for the two groups of boys. On the other hand intake of iron, copper, riboflavin and vitamin C was comparatively low which fulfilled about 40-50% of recommended allowance.

Discussion

In Bangladesh about one fourth of total population are adolescents. It is well documented that the growth velocity during adolescent is slower in undernourished population. Protein energy malnutrition as well as iron deficiency may be a limiting factor for growth during adolescence. In the present study majority of the boys came from educated families with relatively higher social position and better economic conditions; and it did not include boys from urban poor. In the present study nutritional status of most Nutritional status of adolescent boys of the present study are better than that of the boys in the previous national survey. Better socio-economic status may be the main reason for better growth achievement of the participants. A significant number (44.4%) of the participant's father were high official (Teacher/Doctor/Officer/Engineer), 27.2% were employee of Government or non-Government offices and 26.6% were businessman. Educational level of the participant's mothers were comparatively high. Only 16.65% were below SSC and 46.2% passed HSC, 21.95% were graduate. Whereas 15.4% received master degree or above.

The overall prevalence of anemia in the present study was 7.1%, based on WHO criteria. None of the participants was severely anemic (hemoglobin level <7.0 gdl). Findings of a study conducted by Hyder et.al(9) reveals that prevalence of anemia in a rural community of Bangladesh was 69%. The national nutrition survey in 1995-96 reports that the overall prevalence of anemia in adolescent boys were 64.1% in the country. It has been observed from a research study that the prevalence of anemia among

the adolescent boys in Dhaka City was 8.5% (1998 unpublished). The better economic and social background of the study population may be the responsible factor for the low prevalence of anemia. In the present study anemia was more prevalent among the malnourished (Thin and Overweight) children than those of the well nourished group having normal BMI. Another study (unpublished, 1998) of adolescent boys reveals that boys with normal BMI are less likely to have anemia compared with malnourished one. Inadequate dietary intake and/or low dietary bioavailability of iron are considered to be the most important factor contributing to the iron deficiency anemia. Haem iron in the diet increases absorption. The absorption of non-haem iron is influenced by the individual iron status: more iron is absorbed by iron deficient subjects[10]. Moreover, the absorption of non-haem iron is enhanced by dietary factors such as ascorbic acid, meat, fish. In the present study dietary intake of vitamin C was below 50% of RDA.

This study also indicates that the prevalence of overweight (15.4%) is higher than the prevalence of thinness (8.9%) which may be considered as a risk factor for sound health in future. Overweight or obesity coexist with hypertension, heart disease and stroke. Health risks and complication associated with excess weight are responsible for premature death. In addition to the health hazard, it is not uncommon for overweight children to suffer psychological stress and social discrimination.

This study highlight the characteristic of the adolescent boys attending schools. The information obtained from this study may be used to design a randomized school program for the prevention of health defects and the promotion of healthful living.

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