Original Research Article

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Assessment of dietary pattern of school going adolescents in a metro city: a cross sectional study

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ABSTRACT

Background: Childhood is considered as one of the most vulnerable age group in a developing country like India due to poverty and a particular socio-cultural pattern. Epidemiological evidences suggest a strong link between maternal and early childhood undernutrition and increased adult risk of various chronic diseases. The present study aims at assessment of assessment of dietary pattern of school going adolescents.

Methods: The present cross-sectional study was conducted among 440 school going children of class 9th,10th,11th,12th in a Government School at Kolkata, over a period of 6 months. The study participants were interviewed and their responses regarding their dietary patterns, habits, and knowledge about healthy dietary practices were noted down using pre-validated case record proforma. Their anthropometric records were also noted. Statistical analysis used: All the data was entered using Microsoft Excel software and analyzed using appropriate statistical tests with the help of SPSS statistical software.

Results: Majority of children (50%) belonged to age group of 15-16yrs. The present study finds 48% prevalence of overnutrition and 12% undernutrition in school children.

Conclusions: Developing countries like India shows the double burden of nutritional disorders, undernutrition as well as overnutrition due to limited availability of resources on one hand and western food habits, junk/fast food habits on the other hand respectively.

Keywords: School health, Diet in childhood, Malnutrition, Obesity, Healthy diet, Junk foods

INTRODUCTION

Children are often considered as a wealth of a country since they are the future leaders and decision-makers of any country. However, there is considerable ambiguity in the definition of young people and terms like young, adolescents, adults, young adults which are often used interchangeably. World Health Organization (WHO) defines 'adolescence' as age spanning 10 to 19 yrs, Adolescence is further divided into early adolescence (11-14 yrs), middle adolescence (15-17 yrs), and late adolescence (18-21 yrs). Childhood is considered as one

of the most vulnerable age group, since, in a developing country like India due to poverty and a particular sociocultural pattern a substantial number of school children from paediatric age to adolescents suffer from various diseases which can be early diagnosed, treated and prevented. Childhood age is a crucial period for physical, mental and social development.^{2,3} Schools are sacred because they provide an environment for learning skills, and for development of intelligence that can be utilized by students to achieve their goals in life. It is also observed that "to learn effectively children need good health." Health is a key factor in school entry, as well as continued participation and attainment in school.^{4,5} Poor health and poor nutritional status will affect work capacity as well as cognitive functions. Special attention should be given to meet the needs of this group. A child spends most of the time in school between the ages of 6 to 15 years. School is an ideal place for learning and growing up for the child. School health screening is an important aspect of any community health programme. It aims at early detection and treatment of certain disease conditions and preventive measures need to be taken in order to prevent them.² The physical growth of children is reflected by different anthropometric measurements especially weight and height. Anthropometry is used to characterize growth patterns and body composition. Growth patterns are indicators of nutritional status of children and are important in developing intervention programmes.^{2,6} Stunting and wasting are widespread among school-age children in developing countries. High levels of stunting among children suggest that there will also be a long-term deficit in mental and physical development that leaves children unable to take maximum advantage of learning opportunities in schools. Epidemiological evidences suggest a strong link between maternal and early childhood undernutrition and increased adult risk of various chronic diseases.^{7,8} It is also a reflection of inadequate investment and progress in a range of issues related to the human capital development and has a significant influence on the future economic development of a Country. 8,9

The present study aimed at assessment of dietary pattern of school going adolescent children.

METHODS

A cross-sectional study conducted among 440 school going children of class 9^{th} , 10^{th} , 11^{th} and 12^{th} in a Government School at Kolkata, over a period of 6 months. Necessary permissions were taken from appropriate authorities.

All the students studying from 9th to 12th Standard (secondary and higher secondary school education), who consented to participate in the study were selected. Only those participants were selected who answered all the questions from the case record proforma.

Students receiving primary school education, students who did not answer all the questions or who did not consent to participate in the study were excluded from the present study.

Pre-structured and pre-validated case record performa based on nutritional aspect of Indian adolescent health questionnaire (IAHQ) was used for data collection. Data was entered using Microsoft Excel 2013 and the data was presented in the form of charts, tables and analyzed using appropriate statistical tests in order to draw conclusions using SPSS version 17.

RESULTS

The present study was conducted among 440 school going children in a Government school of Kolkata. Out of these, the majority of children (50%) belonged to age group of 15-16 yrs and were in 9th & 10th standards, followed by children below 14 years of age (Table 1). Majority of the study participants were males (55%). In the present study, we assessed the dietary patterns of the school children in order to know their complete nutritional status and observed that majority of students were having a mixed pattern of dietary habits (75%) (Table 2). History of consumption of different food groups including fancy food items was taken based on recall history (last one week was considered). Only 34% of students responded that they daily consume various kinds of fruits, while 33% students responded that they consume fruits often in a week, whereas 32.7% students said that they do not consume or occasionally consumed any kind of fruits in last week. The present study also reported that only 38% students took green leafy vegetables in diet daily and majority of the participants were consuming protective foods like green leafy vegetables infrequently (Table 2).

Table 1: Distribution of cases according to their demographic characteristics.

	Frequency	Percentage (%)		
Age group (years)				
<u>≤</u> 14	129	29.3		
15-16	223	50.68		
17-18	75	17.04		
>18	13 2.95			
Gender				
Male	242	55		
Female	198	45		
Standard				
9 th	135	30.7		
10 th	111	25.2		
11 th	106	24.1		
12 th	88	20		
Total	440	100		

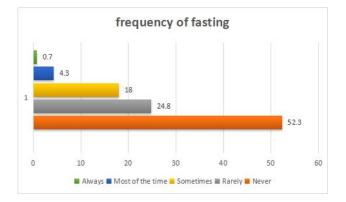


Figure 1: Distribution of cases showing frequency of their fasting (intentional / unintentional).

Table 2: Distribution of cases according to their dietary history: (Recall history from previous week).

Variables	Frequency	Percentage (%)		
Dietary habits				
Vegetarian	106	24.09		
Mixed	334	75.9		
Frequency of consumption of fruits				
Do not consume	58	13.18		
Occasionally per week	86	19.54		
Often in a week	145	32.95		
Daily	151	34.31		
Frequency of consumption of green leafy vegetables				
Never	7	1.5		
Occasionally	78	17.72		
Often in a week	184	41.8		
Daily	169	38.4		
Frequency of consu	nption of deep	fried food items		
Never	13	3		
Rarely	49	11.1		
Sometimes	159	36.1		
Most of the time	151	34.3		
Always	68	15.5		
Frequency of eating non vegetarian diet				
Not taken	106	43.9		
Occasionally	92	20.9		
Very Often	90	20.5		
Daily	65	14.7		

Table 3: Distribution of cases according to their knowledge about healthy dietary practices.

Variables	Frequency	Percentage (%)
Have you been taug school	ght benefit of	healthy eating in
Yes	315	71.6
No	50	11.4
Not sure	75	17
Have you been taug	ht benefits of	healthy eating at
home		
Yes	387	88
No	27	6.1
Not sure	26	5.9

In our study, 14% participants consumed non-vegetarian diet more than twice a week whereas majority of the students consumed it very infrequently (Table 2). History of fasting, revealed that majority of students did not fast (52%), whereas 25% students responded with a positive history of fasting (intentionally or unintentionally). 71% students did not consume carbonated soft drinks, 10% consumed it once in a week (Figure 1). 48% students consumed fast food/junk food once or twice in a week, whereas 32% students did not consume junk food at all (Figure 2). Apart from dietary history recorded from students, we also tried to elicit their knowledge regarding

healthy eating practices those were taught at home and at school. 71% students responded that advantages of healthy eating have been taught to them at home and 88% students said that it was taught to them in school (Table

Table 4: Distribution of study participants according to their BMI.

Height in meter	Frequency	Percentage (%)		
<u><</u> 1.5	53	12		
>1.5	320	73		
Don't know	67	15		
Weight in kg				
<u><</u> 40	43	9.8		
40-50	128	29.1		
51-60	126	28.7		
>60	97	22		
Don't know	46	10.4		
BMI				
Underweight	53	12		
Normal	176	40		
Overweight	120	27.3		
Pre-obese	61	13.9		
Obesity	30	6.8		

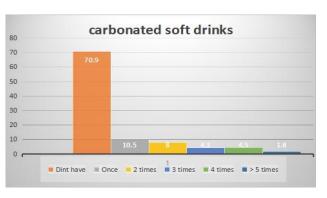


Figure 2: Distribution of cases showing consumption of carbonated soft drink per week (recall history of last week).



Figure 3: Distribution of cases showing consumption of Junk/fast food per week (recall history of last week).

Table 5: Comparison between dietary history and BMI levels of study subjects.

Variables		Underweight	Normal	Over- weight	P value
Diet preference	Veg	13	45	46	0.67
	Mixed	40	131	165	— 0.67
How often you fast	Never	23	91	116	
	Occasionally	26	75	87	0.5
	Very often	4	10	8	
Frequency of eat	ing following foods	s in last week			
	Not had	4	11	16	
Fruits	Occasionally	32	131	153	0.55
FIUITS	Very often	11	21	27	0.55
	Everyday	6	13	15	
	Not had	1	3	8	
Green leafy	Occasionally	34	96	115	0.41
vegetables	Very often	9	49	62	0.41
	Everyday	9	28	26	
	Never	4	3	6	
Fried food items	Occasionally	31	76	101	< 0.05
	Very often	18	97	104	
	Not had	24	86	83	
Non vegetarian	Occasionally	24	63	95	0.43
diet	Very often	3	21	25	
	Everyday	2	6	8	
	Not had	38	122	152	_
Soft drink	Occasionally	13	39	29	0.03
SOIL GIIIK	Very often	1	14	24	0.03
	Everyday	1	1	6	
	Not had	26	112	131	_
Fast food	Occasionally	21	46	54	<0.05
rast 1000	Very Often	3	14	13	<0.03
	Everyday	3	4	13	
Education regard	ding healthy dietar	y habits			
	Yes (home)	37	118	160	
At school	No	7	21	22	0.35
	Not sure	9	37	29	
At home	Yes (school)	47	151	189	
	No	3	13	11	0.8
	Not sure	3	12	11	

The present study finds 48% prevalence of various spectrum encompassing overnutrition and 12% prevalence of undernutrition (Table 4), We found statistical association between consumption of fancy, non-essential food items such as fried food items, junk foods, carbonated soft drinks and overnutrition (Table 5).

DISCUSSION

The present study was carried out amongst 440 government school students of 9th to 12th standard in Kolkata. Majority of students were males among the age group of 15-16 years. While assessing nutrition of any individual, knowing their diet pattern is crucial since diet is the source of all the macro as well as micronutrients, which are required for normal physical and mental

development of a child in order to achieve their desired potential. Typical Indian diet is said to be a balanced diet as it includes the required constituents in recommended quantities. Hence we enquired about all the essential and non-essential components of a diet. This present study observes that majority of students had mixed pattern of diet, however, the frequency of consumption of actual non-vegetarian diet was limited to once or twice a week in most of the participants. Non vegetarian foodstuff is considered as a good source of macronutrients like proteins and micronutrients like iron, B-complex vitamins etc. Fruits and vegetables are considered as sources of vitamins, minerals and antioxidants which are called as protective foods. In our study participants, only 34% and 38% students daily consumed fruits and green leafy vegetables respectively, while most of the students

consumed this protective group of foods very infrequently. Kotecha et al conducted a similar study among school students of 6 to 12th, standard and observed they observed that 75% of their participants consumed green leafy vegetables in last 24 hours while 63% consumed fruits.¹¹ Rathi et al in their study also reported that 40% study participants consumed green leafy vegetables regularly. 12 However, Ahmed et al, in their study conducted in school children of Pakistan observed that only 2-10% of study participants consumed green leafy vegetables on a regular basis, while 8-14% students consumed non-vegetarian diet and 22% consumed eggs. 13 Kotecha et al in their study observed that 13% of their study participants consumed non-vegetarian diet in last 24 hours.¹¹ Rathi et al in their study observed the percentage of adolescents who consumed meat regularly was 22%.12

Intake of nonessential foods in excess quantities often leads to overnutrition. Among our study participants, we found that majority of students consumed fried food items, junk foods, and carbonated soft drinks very often and only 11% students responded that they consumed it rarely. Kotecha et al in their study observed that 30-40% participants consumed various types of fast food items in their diet.¹¹ When we compared our findings with body mass indices of students, we found that consumption of junk/fast food was found to be associated with higher BMI (overnutrition). Deep fried food items and carbonated drinks are sources of energy-dense foods, which are responsible for the development of obesity among children. Most of the study participants responded that importance of consuming healthy diet has been taught to them both at home and at school, however, the contents of the health education could not be assessed. The present study finds 27.3% students overweight, 13.9% students pre-obese and 6.8% students obese. Salameh et al conducted a similar study in a moderately developed country, Lebanon et al observed that 9% individuals in their study were underweight, 16.5% were overweight, 4.1% were obese, while 67% participants were having normal body mass index.¹⁴

In the present study, it can be concluded that unhealthy dietary habits show a higher predilection towards obesity. Developing countries like India shows the double burden of nutritional disorders, undernutrition as well as overnutrition due to limited availability of resources on one hand and western food habits, junk/fast food habits on the other hand respectively. The current study showed significant association of faulty dietary habits towards the development of obesity, which in turn makes an individual susceptible for a number of noncommunicable diseases such as diabetes mellitus, hypertension, cardiovascular disorders, hormonal disturbances etc in future. This warrants incorporation of behaviour change communication sessions which need to be conducted periodically at the levels of schools to inculcate healthy food practices among youths.

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Ethical approval: The study was approved by the

Institutional Ethics Committee

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