



Dietary Practices, Junk Food Consumption and Overweight Among Adolescents in Schools of Urban Slums, Bengaluru

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ABSTRACT

Introduction: Non-communicable diseases (NCDs) are among the rising trend and are often caused by modifiable risk factors. Adolescents are frequent victims due to junk food consumption and unhealthy diet leading to overweight and obesity. A nutritionally adequate and balanced diet is essential for optimal growth and development.

Objectives: A cross-sectional study to assess the knowledge, attitude and dietary practices among the adolescents of urban slums. Also, to find the association of Body Mass Index (BMI) with frequency of junk foods consumption.

Materials and methods: 230 adolescents aged 13-15 years in Bengaluru Urban slums were assessed using multi-stage random sampling technique and data was collected. Bowl-method was employed to quantify the measurements of foods consumed. Standard precautions were taken to measure height and weight. Chi-square test was used to find association between BMI and frequency of junk food consumption.

Results: Mean age of the students was 14.02 (SD 0.96) and majority were in 8th standard (42.2%). 116 (50.4%) of them were boys. Mean BMI of the adolescents was 20.7kg/m² (SD 3.6) where, 68 (29.6%) of them were underweight, 62 (27%) were overweight and 4 (1.7%) were obese. Only 39% had good knowledge, 71% had favourable attitude and good practice in 31% of adolescents. There was significant association with frequency of junk food consumption and BMI variation.

Conclusion: Adolescents had poor knowledge and practice. Overweight was more prevalent among boys and Underweight in girls. There was significant association with frequency of junk food consumption and BMI variation.

Keywords: Knowledge, Attitude, Practice, Junk foods.

INTRODUCTION

Non-communicable diseases (NCDs) are among the rising trend and are often caused by modifiable risk factors. 4.1 million annual deaths of NCDs have been attributed to excess salt/sodium intake.¹ Childhood obesity is most serious public health challenges of the 21st century.² Overweight and obesity are defined as "abnormal or excessive fat accumulation that presents a risk to health".³ The

problem is global and is steadily affecting many low- and middle-income countries, particularly in urban settings. The prevalence has increased at an alarming rate. Globally, in 2016 the number of overweight children under the age of five, is estimated to be over 41 million. Almost half of all overweight children under 5 lived in Asia.⁴ Studies have shown that obese adolescents are more likely to develop hypertension later in life as compared to their leaner counterparts. To reduce the prevalence of NCDs

bold action is needed to halt the rise in childhood obesity thus reducing mortality.⁵

India is home to 253 million adolescents – children aged 10 to 19 years – the most adolescents of any country. Sadly, a large proportion of India's adolescents are anaemic: 56 per cent of girls and 30 per cent of boys.⁶ Nutritional deficiencies and poor eating habits established during adolescence can have long-term consequences, including delayed sexual maturation, loss of final adult height, osteoporosis, hyperlipidaemia, and obesity.⁷ Junk foods, on the other hand are the foods or beverages that have low nutrient density, provide calories primarily through fats or added sugars and have minimal amounts of vitamins and minerals. Adolescents are frequent victims due to junk food consumption and unhealthy diet leading to overweight and obesity. Addressing the nutrition needs of adolescents could be an important step towards breaking the vicious cycle of intergenerational malnutrition, chronic diseases and poverty.⁸

The economic transition, changing lifestyles of people both in rural and urban areas are at a rapid pace today and the urban slums are most vulnerable due to migration of the population. Thus, causing the shift from traditional to 'modern' foods, changing cooking practices, increased intake of processed and ready-to-eat foods, intensive marketing of junk foods and 'health' beverages have affected people's perception of foods as well as their dietary behaviour. Irrational preference for energy-dense foods and those with high sugar and salt content pose a serious health risk to the people, especially adolescents. The increasing number of overweight and obese children in the community and the resulting burden of chronic non-communicable diseases necessitate systematic nutrition educational interventions on a massive scale. There is a need for adoption of healthy dietary guidelines along with strong emphasis on regular physical exercise.⁹

A nutritionally adequate and balanced diet is essential for optimal growth and development. Appropriate diet and physical activity during childhood is essential for optimum body composition, BMI and to reduce the risk of diet-related chronic diseases in later life. According to National Institute of Nutrition, the adolescent boys and girls of age 13-15 years require 2750kCals and 2330kCal per day respectively. Additional intake requirements include fat, calcium, iron, zinc, vitamins, and fibre. Hence, for a balanced diet adolescent need 330-420gms of cereals, 60-75gms of pulses, 400-450gms of vegetables, 100gms of fruits and 500ml of milk.⁹ The clinical assessment of nutritional status begins with obtaining a good diet history of the patient and this could be offered by the body mass index.⁷

The current study was designed among the adolescents of urban slums to assess the knowledge, attitude and dietary practices. Also, the study aimed to find the association of overweight with the frequency of junk foods consumption by computing BMI of the adolescents in urban slums of Bengaluru.

MATERIAL AND METHODS

A cross-sectional study was conducted during the months of July to September 2017. Permission to conduct the study was obtained from Institutional Ethics Committee of Bangalore Medical College and Research Institute (BMCRI) and Block Education Officer (BEO) of South Zone, Bengaluru. The urban slums present under the urban field practice area of BMCRI were chosen for the study. The urban field practice area is divided into 3 sectors and has 2 government and 6 private higher primary and secondary schools. 4 out of 8 schools were selected randomly among the 3 sectors of urban slums. The mid adolescents aged 13-15 years attending school in urban slums of South zone of Bengaluru were chosen as study participants. Those students who were present on the day of data collection were included in the study. The adolescents who were not willing to participate were excluded. According to a study conducted by Devi. AA et al in 2016, prevalence of knowledge on nutrition was 43.7%.¹⁰ Considering relative precision of 15% and 95% confidence limits, sample size was calculated to be 230. Multi-stage random sampling was used as sampling technique.

A pre-tested and semi-structured questionnaire formed by the guidelines of National Institute of nutrition (NIN)⁹ and Global school-based student health Survey (GSHS)¹¹ was used to collect the data. The study tool consists of demographic details, Socio-economic status based on Modified Kuppaswamy's Classification,¹² knowledge on balanced diet, Recommended Dietary Allowances (RDA) of foods like cereals, pulses, vegetables and fruits, milk and eggs to be consumed by an adolescent and on junk foods. The scoring was done for each of the components and >80%, 80%-50%, <50% was considered as good, average and poor knowledge. The attitude of food habits like having regular breakfast, three meals a day and snacks in between meals were assessed using a three-point Likert scale. The dietary practices were taken by asking the quantity of consumption of foods in the number of bowls using a bowl which measured 100gms. Also, the frequency of consumption of candies, chocolates, nuts and dry fruits, junk foods like foods made of white flour, fried and salty foods and carbonated drinks and visits to junk food outlets were included.

After taking assent from the Head of the Institution, the data was collected through interview technique.

Height in centimeters was measured with the help of measuring tape which was fixed to the wall. Weight in kilograms was measured with minimal clothing and no shoes with a scale carried from Urban health Centre after calibration. Body mass index was computed with the help of height and weight recorded. Standard procedures were used to measure height and weight by trained ASHA workers and health inspector students.

Criterion of BMI for Underweight, Overweight and Obesity: Overweight is defined as Body Mass Index (BMI) at or above the 85th percentile or >+1SD and below the 95th percentile (>25kg/m² to <30kg/m²) and obesity as BMI at or above the 95th percentile (>30kg/m²) for adolescents of the same age and sex. Underweight is defined as <-2SD (<18.5kg/m²).¹³

Statistical analysis: Data was collected using Google forms and transferred to MS Excel and analysed using SPSS version 20.0 software. Qualitative variables were expressed in frequency and percentages. The quantitative data were summarized through mean with standard deviation. Chi-square test was used to find the association between BMI and frequency of consumption of junk foods.

RESULTS

A total of 230 students were interviewed and collected the data. Mean age of the students was 14.02 (SD 0.96). Most of the students were studying in 8th standard (42.2%). In the study group 114 (49.6%) were girls and 116 (50.4%) were boys. Socio-demographic characteristics of students are shown in Table 1.

Out of 230 participants, 131 (57.0%) consumed mixed diet and 168 students (73.0%) had rice as their staple food. In the study group, Mean BMI of the adolescents was 20.7kg/m² (SD 3.6) where 68 (29.6%) of them were underweight, 62 (27%) were overweight and 4 (1.7%) were obese. Among 116 girls 48 (41.3%) were underweight and 28 (24.1%) were overweight and none were obese. Among 114 boys 34 (29.8%) were overweight and 4 (3.5%) were obese. Distribution of number of adolescents according to BMI is shown in Figure 1.

Only 38 adolescents (16.5%) had adequate knowledge on balanced diet and its composition. About 95 (41.3%) of the adolescents had good knowledge on RDA and 72 (31.3%) of them had good dietary practices. The knowledge and practices of daily requirement of various foods is shown in Table 2 and Table 3 respectively. A quarter of them, 58 (25.2%) knew about junk foods and its unhealthy effects. There was found to be having significant association between educational status of the parents with healthy dietary practices. (P value

<0.001). Also, there was significant association between socio-economic status and dietary practices.

174 students (75.6%) agreed to have three meals a day and snacks, majority of them (203, 88.2%) agreed to have breakfast regularly. About half of the adolescents, 118 (51.3%) were neutral on junk foods. The habit of often skipping breakfast was reported by 119 (51.7%) adolescents before attending school. Majority of them, 72 (31.3%) skipped once in 3-4 days and the most common reason reported by the 69 (30.0%) students was due to dislike of the taste of food.

The frequency of foods made of white floor consumed by adolescents was more commonly observed in more than 15 days in 134 (58.2%) adolescents. The frequency of consumption of fried foods in more than 15 days was seen in 121 (52.6%). Carbonated drinks were also consumed once in more than 15 days by 131 (56.9%) adolescents.

Table 1: Sociodemographic profile of adolescents.

Sociodemographic Profile	Adolescent (%)
Age (yrs.)	
13	52 (22.6)
14	105 (45.6)
15	72 (31.3)
Sex	
Boys	114 (49.6)
Girls	116 (50.4)
Type of family	
Nuclear family	130 (56.5)
Joint family	63 (27.4)
Three generation family	37 (16.1)
Socio-economic Status	
Class I	17 (7.4)
Class II	77 (33.5)
Class III	124 (53.9)
Class IV	12 (5.2)
Education status of Mother	
Non - formal education	172 (74.7)
Formal education	58 (25.2)
Education status of Father	
Non - formal education	102 (44.4)
Formal education	128 (55.6)
Type of diet	
Veg	99 (43)
Mixed	131 (57)
Staple food	
Rice	168 (73.0)
Wheat	56 (24.3)
Ragi	6 (2.6)

Table 2: Distribution of adolescents according to BMI

	Boys (%)	Girls (%)	Total (%)
Underweight	20 (8.7)	48 (20.9)	68 (29.6)
Normal	56 (24.3)	40 (17.4)	96 (41.7)
Overweight	34 (14.8)	28 (12.2)	62 (27.0)
Obese	4 (1.7)	0 (0.0)	4 (1.7)

Table 3: Knowledge of adolescents on balanced diet

	Occasionally (%)	1 cup (%)	2 cups (%)	3 cups (%)	4 cups (%)	5 cups (%)
Rice and other cereals	7 (3.0)	42 (18.2)	87 (37.8)	70 (30.4)	19 (8.2)	5 (2.1)
Dhal and other pulses	18 (7.8)	113 (49.1)	74 (32.2)	22 (9.5)	3 (1.3)	-
Vegetables	65 (28.3)	82 (35.7)	71 (30.9)	12 (5.2)	-	-
Fruits	13 (5.6)	117 (50.8)	55 (23.9)	28 (12.1)	17 (7.3)	-
Milk	11 (4.8)	130 (56.5)	78 (33.9)	11 (4.8)	-	-

Table 4: Practice of adolescents on balanced diet

	Occasionally (%)	1 cup (%)	2 cups (%)	3 cups (%)	4 cups (%)	5 cups (%)
Rice and other cereals	16 (6.9)	119 (51.7)	62 (26.9)	25 (10.8)	8 (3.5)	-
Dhal and other pulses	23 (10.0)	103 (44.7)	81 (35.2)	17 (7.3)	6 (2.6)	-
Vegetables	89 (38.6)	100 (43.4)	32 (13.9)	9 (3.9)	-	-
Fruits	122 (53.0)	76 (33.0)	22 (9.7)	10 (4.3)	-	-
Milk	36 (15.7)	124 (53.9)	45 (19.6)	25 (10.9)	-	-

Table 5: showing association between frequency of consumption of junk foods and distribution of BMI.

	Underweight (%)	Normal (%)	Overweight (%)	Obese (%)	Total (%)	P Value*
Foods made of white flour						
>15 days	45 (33.5)	74 (55.2)	17 (12.7)	0 (0.0)	136 (59.1)	<0.001
8-15 days	21 (50.0)	10 (20.5)	9 (20.5)	02 (5.2)	42 (18.3)	
<7 days	02 (6.1%)	12 (36.3%)	36 (51.5%)	02 (6.1)	52 (22.6)	
Fried and salty foods						
>15 days	37 (30.5)	59 (48.8)	25 (20.7)	00 (0)	121 (52.6)	0.004
8-15 days	11 (30.5)	18 (50.0)	07 (19.5)	00 (0)	36 (15.7)	
<7 days	20 (27.5)	19 (26.0)	30 (41.0)	04 (5.5)	73 (31.7)	
Carbonated drinks						
>15 days	56 (32.4%)	72 (41.6)	43 (24.8)	02 (1.2)	173 (75.2)	0.008
8-15 days	04 (19.0)	14 (66.7)	03 (14.3)	00 (0.0)	21 (9.1)	
<7 days	08 (22.2)	10 (27.8)	16 (44.4)	02 (5.6)	36 (15.7)	

*chi-square test

There was significant association between frequencies of consumption of foods made of white flour, fried and salty foods and carbonated drinks with underweight, overweight and obesity with P value <0.05 according to chi-square test. The distribution of frequencies of consumption of junk foods and variations in BMI is shown in Table 4.

DISCUSSION

The knowledge of balanced diet and RDA has greater impact on the child’s development. Adequate knowledge in the early life will continue to shape attitudes and dietary practices throughout adulthood.

In this study information was collected regarding quantity of consumption of foods and the reported practices were taken into consideration which can lead to bias. To minimise the bias, bowl method was used for approximation. In general, it is difficult to quantify foods consumed by any person. Though the frequency of junk food consumption was categorised to fit all intervals of consumption patterns, there can be biased reporting of practices. Efforts were taken to reduce bias by showing images and providing lists of foods during collection of data.

The concept of balanced diet and RDA were taken from the Annexure-4 prescribed by NIN for the adolescents aged 13-15 years. The categorisation of adolescents specific to 13-15 was also based on the bands of categories given by NIN. Therefore, the scoring of the answers was also based on the Annexure-4 of NIN.

Association of frequency of junk food consumption with the anthropometric measurements is not ideal since mere consumption of junk foods will not alter the BMI. Also, the students were unaware of the differentiation of junk foods with healthy foods. Careful measures were taken to reduce the bias of poor knowledge on junk foods.

The consumption of egg and other non-vegetarian foods were not taken into account. The consumption of obesogenic foods or some traditional practice were also excluded. The details of physical activity of students were not included in the study. Intake of alcohol was not considered assuming non-consumption by adolescents. The details of familial obesity and other co-morbidities were also excluded. These factors can be considered as limitations of the study.

Adequate care was taken to measure height and

weight of students using standard protocols by trained students. Obesity was measured with BMI only. Waist circumference was not taken into consideration as it is a surrogate and less important indicator of obesity. The cut-off for BMI was taken from CDC prescribed according to Asian population.

As per this study, the knowledge of students increased as they were of higher standards. The knowledge on junk foods also significantly increased as they grew older. There was significant association between education status of the parents and dietary practices. The socio-economic status had greater impact on the variety as well as frequency of junk foods consumption. Joshi et al,¹⁴ evaluated the role of sociodemographic characteristics on nutritional status of children and concluded that 'literacy' and 'socio-economic status' of the parent are key factors contributing to 'malnutrition' in children and that prevalence can be reduced by increasing awareness.

In a study conducted by Sarkar M et al,¹⁵ evaluated the association between nutritional status with eating habits of adolescent rural school girls and concluded that there was significant association found between different age groups, consumption of roots & tubers, cereals, puffed rice, green non leafy vegetables, fatty foods, eating at fast food centre, skipping of meals, going hungry, physical activity, number of classes on healthy eating.

Hegde AM et al,¹⁶ conducted a survey to assess the knowledge, attitudes and the eating practice of nutritious and junk food among rural school children and concluded there was better knowledge and attitude among the older children on nutrition. However, there was an increased preference for junk foods among both the younger and older children alike, the taste and visual appeal being the major reasons.

Our study showed that prevalence of Obesity and overweight among adolescents 1.7% and 27% respectively. Sumit Kar et al,¹⁷ in a study estimated the prevalence and sociodemographic correlates of childhood obesity and elevated blood pressure (BP) among adolescent schoolchildren in urban areas of Gangtok, Sikkim, India. Prevalence of obesity, overweight, and hypertension was 2.04%, 14.5% and 5.62%, respectively. The average fast food intake and limited outdoor activities were significantly associated with obesity. The burden of overweight/obesity as well as hypertension was found to be high.

In our study, there was found to be significant association between junk food consumption and overweight and obesity. Vani HC et al,¹⁸ evaluated the correlation between frequency of fast food

consumption and overweight and concluded that consumption of puff, aerated drinks and ice cream significantly correlated with increased waist circumference and BMI.

CONCLUSION

In our study, only 39% of the children had good knowledge regarding the nutrition and balanced diet. Though 71% children were having good attitude towards healthy eating habits, but good practice was found in less than half of the adolescents (31%). The socio-economic status and literacy of parents was found to be significantly associated with good dietary practices. About 33% of the adolescents were overweight and found to have significant association with frequency of junk food consumption. Undernourishment (30%) was more prevalent among the adolescents especially in girls.

RECOMMENDATIONS

As overweight and obesity are major causes of rising NCDs, dietary diversification and food fortification for ensuring adequate nutrition at household level makes an important step. School-based nutrition interventions such as, intensive health education dedicated to nutrition to be a part of curriculum to enrich the knowledge and addressing behaviour modification to bring about dietary change in adolescents. Also, to create awareness in early age regarding physical activity and lifestyle modifications. This can be achieved using a social marketing approach, behaviour change through communication and mobilizing families and communities. In addition, control of micronutrient deficiencies; regular nutrition assessment and counselling of adolescents plays a major role in improving nutritional status of the adolescents. Thus, as recommended by WHO, leadership for comprehensive, integrated, multisectoral action to end childhood obesity should be implemented in schools as well as in the community.

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