



Increasing Proclivity for Junk Food among Overweight Adolescent Girls in District Kurukshetra, India

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Abstract

Obesity in adolescents is gradually becoming a major public health problem in many developing countries, including India. Being overweight as an adolescent is associated with being overweight as an adult. Change in dietary habit of consuming more high energy junk food and shifting to sedentary lifestyle is likely to be one of the important precursors of overweight and obesity among adolescents. Keeping this in view, the present study was conducted on overweight adolescent girls aged 16-18 years selected purposively from two different schools in district Kurukshetra, Haryana state. Maximum (63%) subjects had monthly family income in the range of Rs. 25,000-50,000. More than two-third (66.25%) adolescent girls skipped at least one meal a day and the most frequently missed meal was breakfast (41.25%). The most common (60.37%) effect of skipping meal among adolescent girls was consumption of junk food. Potato chips, chocolate and carbonated drinks respectively, were the most (100%, 92.50%, 91.25%) preferred junk food item. The data further revealed highly significant ($P \leq 0.05$) and positive correlation between fried foods vs weight and BMI ($r=0.524, 0.334$), respectively. Chinese foods were also significant ($P \leq 0.05$) and positively correlated to weight and BMI ($r=0.342, 0.224$), respectively. The adolescent girls were consuming excess of energy, protein and fat but inadequate micronutrients like iron and beta-carotene. The results of the present investigation suggested that it is necessary to promote healthy eating habits among adolescents and educate them about ill effects of junk food so as to prevent overweight/obesity and obesity related complications.

Keywords: Adolescent girls, junk food, overweight.

Introduction

Adolescence is characterized by an exceptionally rapid rate of growth and is often variable in individuals due to its dependence on genetic hormonal and nutritional factors¹. The proportion of adolescents who are overweight or obese is high and rapidly increasing². Being overweight as an adolescent is associated with being overweight as an adult. Numerous health risks have been associated with adolescent overweight, including hypertension, respiratory disease, several orthopedic disorders, diabetes mellitus and elevated serum lipid concentrations³. Diet is likely to be one of the important precursors of overweight and obesity. Metamorphosis of food habits has led to the replacement of nutritious food by things that are tasty, convenient, in vogue-junk food. Food high in salt, sugar, fat or calories and low nutrient content is called junk food. Junk foods provide suboptimal nutrition with excessive fat, sugar, or sodium per kcal⁴.

The practice of high consumption of junk foods like maggi noodles, burgers, *pao-bhaji*, sandwiches, hot dogs, patties, pastries, popcorn, potato chips, carbonated drinks, biscuits, muffins, toast, *kulcha- channa, samosa*, chocolates etc. have become common feature of adolescent's diet⁵. Adolescent's eating behaviors are strongly influenced by their social environments, which include family, peer networks, schools, advertising, religion and knowledge⁶. Ill effects of regular intake

of junk foods are mainly lack of energy, poor concentration and obesity leading to inferiority complex, depression, heart diseases, high cholesterol, stunted growth, premature ageing, and tooth decay⁷. According to a study on adolescents, with excessive consumption of processed foods and high fat diets obesity is on the rise⁸.

Dietary quality declines from childhood to adolescence⁹, with dietary habits likely to promote fatness being actively adopted. For example, the consumption of fruit, vegetables, and milk decreases from childhood to adolescence^{9,10}, while soft-drink consumption increases⁹⁻¹¹. Due to increasing allurements of adolescents towards junk food and increasing prevalence of overweight/obesity among adolescents, the present study was conducted to examine and understand the eating behaviour of school going overweight adolescent girls in district Kurukshetra, Haryana.

Material and Methods

Selection of subjects: A sample of 80 overweight adolescent girls aged between 16-18 years were selected by purposive sampling method from two private schools attended by middle and high income group students in district Kurukshetra, Haryana.

Data Collection: The age of adolescent girls was ascertained by questioning them and later confirmed from school registers. In

case of any discrepancy between the two, the date in the school register was taken as accurate. Age in completed years was taken for analysis. A pre-tested and pre-designed performa was used to collect the information on socio-demographic characteristics like age, family type, monthly family income; dietary history and consumption of junk food.

Dietary Intake: Dietary intake of the overweight adolescent subjects was adjudged by 24-hour recall method for three consecutive days using standardized containers. Those days were avoided which include fasting, festivals or wedding or any other occasion. The different food items consumed were converted into their raw equivalents; categorized into their respective food groups and average daily intake of energy, protein, fat, calcium, iron, beta- carotene and vitamin C were calculated from the values per 100 g of edible portion using MSU nutriguide¹². The nutritive value of some of the foods like maggi noodles, potato chips, biscuits etc. were taken from the information provided on the packaging of product. The calculated nutrient intake was compared with the recommended dietary allowances (RDA) for the respective age group (16-18 years)¹³.

Anthropometric measurements: Height and weight were measured by using the methods of ICMR¹⁴. Weight was measured using an electronic balance (ATCO) with 100g of accuracy. The weight was recorded in kilograms, to the nearest 100 grams. The body mass index (BMI) was calculated as the weight in kilogram/height in meter² and it was classified according to the classification given by American National Institutes of Health and National Heart, Lung and Blood Institute¹⁵. Adolescent girls having body mass index (BMI) below 18.5 kg/m² were labeled underweight and between 18.50-24.99 kg/m² were considered normal. Whereas, study subjects having BMI between 25-29.99 kg/m² were classified as overweight.

Statistical Analysis: Data was compiled, analyzed and presented in proportions and percentages. Pearson correlation was employed to determine bivariate relationship. Statistical analysis were undertaken using the Statistical Package for Social Sciences (SPSS) version 16.0.

Results and Discussion

General Profile: The general information of overweight adolescent girls is shown in table 1. Out of 80 adolescent girls, most of the respondents were in the age group of 18 years (42.50%), followed by 17 years (37.50%) years and rest (20%) were 16 year old. The subjects were predominantly *hindu* (76.25%) and 23.75 per cent of the subjects had faith in *sikhism*. Among all the subjects, maximum (41.25%) were studying in xii standard and minimum (20%) in x standard. Among adolescent subjects, 75, 10 and 15 per cent had nuclear, joint and extended family pattern, respectively. It was observed that majority of fathers (75%) were engaged in business and mothers

(85%) were housewives. Maximum (63%) subjects had monthly family income in the range of Rs. 25,000-50,000 and minimum (12.50%) had monthly family income above Rs. 75,000. The data in Table 1 revealed that 50, 36.25 and 13.75 per cent of the subjects received monthly pocket money in the range of Rs. 100-800, Rs. 801-1000 and more than Rs.1000, respectively. It was seen that majority (56.25%) of the respondents spent upto 20 per cent of their pocket money on junk food. The mean height and weight of the subjects was 157.26 ± 4.00 cm and 64.98 ± 8.50 kg, respectively. Body Mass Index (BMI) was used for assessing nutritional status. The mean BMI of adolescent girls was 26.88 ± 1.70 kg/m² (table 2).

Table-1
General profile of the overweight adolescent girls

Variables	Number of subjects (N= 80)
Age (in years)	
16	16 (20)
17	34 (42.50)
18	30 (37.50)
Religion	
Hindu	61 (76.25)
Sikh	19 (23.75)
Educational Qualification	
10	16 (20)
10 +1	31 (38.75)
10+2	33 (41.25)
Father's occupation	
Service	20 (25)
Business	60 (75)
Mother's occupation	
Housewife	68 (85)
Service	9 (11.25)
Self employed	3 (3.75)
Family type	
Nuclear	60(75.00)
Extended nuclear	12 (15.00)
Joint	8 (10.00)
Family Income (Rs./Month)	
25,000-50,000	50 (62.50)
50,001-75,000	20 (25.00)
>75000	10 (12.50)
Pocket Money	
100-800	40 (50)
801-1000	29 (36.25)
>1000	11 (13.75)
Percentage of pocket money spent on junk food	
0-20%	45 (56.25)
21-40%	25 (31.25)
>40%	10 (12.50)

Figures in parenthesis indicate percentages

Table-2

Mean anthropometric values in overweight adolescent girls

Variables	Number of subjects(N=80)
Height (cm)	157.26 ± 4.00
Weight (kg)	64.98 ± 8.50
BMI (kg/m²)	26.88 ± 1.70

Figures in parenthesis indicate percentages.

Dietary Habits: Most of the adolescent girls were vegetarian (66.25%) and pattern of meals consumption per day indicated that more than half of the respondents (51.25%) were consuming four or more meals per day. Skipping of meals was common in more than half of the subjects (66.25%). Commonly skipped meal was breakfast, lunch and dinner in 41.25, 17.50 and 7.50 per cent of the subjects, respectively. High rates of meal skipping behaviour among adolescents, particularly breakfast skipping (79%), followed by lunch (67%) and dinner (52%) have been reported earlier¹⁶. Niemeier et al.¹⁷ found positive correlation between increased fast food consumption, skipped breakfasts and increased body mass index. Ensuing analysis of the data indicated that 94.32 per cent of the subjects were skipping meals more than once a week. There were only 5.66 per cent of the subjects who were daily skipping the meal. The factors responsible for skipping the meals were lack of time (54.71%), companionship (22.5%) and to some extent meal not tasty (13.20%). Majority (68.75%) of the subjects consumed in between meals. Eating in between meals is one of the causes of unwanted obesity¹⁸. Consumption of junk foods was observed among majority (60.37%) of the subjects as a replacement for meal skipping. Majority (60%) of the subjects consumed home prepared snacks and junk food, while remaining (40%) subjects procured snacks and junk food from different sources. About 47 per cent of adolescent girls consumed junk food twice a week. Further, 30 and 21.25 per cent consumed junk foods thrice and once a week, respectively. Ravi and Truman¹⁹ reported a high consumption of junk foods and carbonated beverages among overweight adolescents (table-3).

Junk food and Snack consumption pattern: Consumption of various junk foods and snacks among adolescent girls is given in table 4. Potato chips were the most (100%) preferred junk food item and *kachori*, a deep fried Indian snack came out to be the least (8.75%) preferred item. Chocolate was the most (92.50%) liked sweet item among adolescent girls. Table 4 depicted that 60, 50, 13.75 and 10 per cent of subjects consumed south Indian foods like *idli*, *dosa*, *wada* and *uttapam*, respectively. The most liked Italian food was pizza (40%), followed by pasta (25%) and macroni (20%). Noodles were the most (65%) preferred Chinese food item by the subjects. These results are consistent with other studies which suggest that junk food (bakery items, pizza, burger, cheese, butter, oily items) chocolate intake tends to be more common among overweight and obese adolescents than among normal-weight adolescents²⁰.²¹. Maximum (91.25%) subjects were consuming carbonated drinks, 80 per cent were taking tea, 53.75 per cent used to consume coffee, while 32.50 and 13.75 per cent subjects liked

juices and any other drink (*shikanjee*, lemon water etc.), respectively. Moreno et al.²² reported showed that drinking carbonated drinks increase obesity and overweight.

Table-3

Dietary habits of the overweight adolescent girls

Variables	Number of respondents (N=80)
Food Habits	
Vegetarian	53 (66.25)
Non-vegetarian	10 (12.50)
Ovatarian	17 (21.25)
Frequency of consumption	
2 times/day	09 (11.25)
3 times /day	30 (37.50)
4 times or more/ day	41 (51.25)
Skipped Meals	
Breakfast	33 (41.25)
Lunch	14 (17.50)
Dinner	6(7.50)
No	27 (33.75)
Frequency of skipping meal (n=53)	
Once a day	3 (5.66)
Once a week	25 (47.16)
Twice a week	18 (33.96)
> Twice a week	7 (13.20)
Purpose of skipping meals (n=53)	
Companionship	7 (13.20)
Not tasty	29 (54.71)
To save time	
Effect of Skipping meals (n=53)	
Consume more food	10 (18.86)
Consume junk food	32 (60.37)
Any other food	11 (20.75)
Frequency of consuming junk food	
Daily	2 (2.50)
Weekly	17 (21.25)
Twice a week	37 (46.25)
Thrice a week	24 (30.00)
Sources of purchasing junk food	
Home prepared	48 (60)
Any other	32 (40)
Eating between meals	
Yes	55(68.75)
No	25(31.25)

Figures in parenthesis indicate percentages

Correlation coefficient between Junk food and Anthropometric measurements: The data in the table 5 revealed that correlation coefficient were significant ($P \leq 0.05$) and positive between fried foods and weight and BMI ($r = 0.524$, 0.334), respectively. Significant ($P \leq 0.05$) and positive

correlation was also observed for Chinese foods vs weight and BMI ($r= 0.342, 0.224$), whereas, bakery products and Italian foods showed positive but non- significant correlation with weight and BMI ($r= 0.111, 0.155; 0.158, 0.147$), respectively. The consumption pattern of adolescent girls further revealed a positive but non -significant association between south Indian foods and sweet dishes vs weight and BMI ($r= 0.059, 0.134; 0.129, 0.059$), respectively.

Table-4
Consumption pattern of Snacks and Junk Food among overweight adolescent girls

Food Items	Number of respondents (n=80)
South Indian*	
Idli	48 (60.00)
Dosa	40 (50.00)
Wada	11 (13.75)
Uttapam	8 (10.00)
Bakery items*	
Biscuit	62 (77.50)
Bread	52 (65.00)
Cake	14 (17.00)
Pastry	24 (30.00)
Patties	10 (12.50)
Italian food	
Pizza	32 (40.00)
Pasta	20 (25.00)
Macroni	16 (20.00)
Chinese*	
Maggie	43 (53.75)
Manchurian	32 (40.00)
Noodles	52 (65.00)
Spring roll	28 (35.00)
Sweet dish*	
Chocolate	74 (92.50)
Halwa	20 (25.00)
Ice cream	57 (71.25)
Mithai	26 (32.50)
Fried Food*	
Bread Pakora	60 (75.00)
Burger	52 (65.00)
Chaat	42 (52.50)
Kachori	7 (8.75)
Kulcha-channa	64 (80.00)
Potato chips	80 (100.00)
Samosa	37 (46.25)
Tikki	27 (33.75)
Beverages*	
Tea	64 (80)
Coffee	43 (53.75)
Carbonated drinks	73 (91.25)
Juices	26 (32.50)
Any other	11 (13.75)

Figures in parenthesis indicate percentages, *Table with multiple responses.

Table-5
Correlation coefficient between Junk food and anthropometric measurements

Food items	Anthropometric Parameters	
	Weight	BMI
South Indian foods	0.059 ^{NS}	0.134 ^{NS}
Bakery products	0.111 ^{NS}	0.155 ^{NS}
Italian food	0.158 ^{NS}	0.147 ^{NS}
Chinese food	0.342*	0.224*
Sweet dishes	0.129 ^{NS}	0.059 ^{NS}
Fried food	0.524*	0.334*

NS: Non- significant, * Significant at $P \leq 0.05$

Nutrient Intake: The data in table 6 revealed that the mean daily energy intake of adolescent girls was 110.67 per cent of the Recommended Dietary Allowances (RDA) and that of protein was 121.30 per cent. Fat intake was almost double of recommended dietary allowances. However, the iron and beta - carotene intake among adolescent girls was nearly half and about two third of the RDA, respectively. Calcium intake among adolescent girls was 110.36 per cent of the RDA. The average daily intake for vitamin C was 104.25 per cent of the RDA by the subjects.

Table-6
Mean nutrient intake of overweight adolescent girls (N= 80)

Nutrient	RDA Mean + SD % adequacy		
Energy (Kcal)	1957	2166 ± 155	110.67
Protein (g)	59.85	72.60 ± 8.50	121.30
Fat (g)	20.9	41.50 ± 7.2	198.56
Calcium (mg)	500	551.80 ± 40.1	110.36
Iron (mg)	30	16.2 ± 4.08	54
β-carotene (µg)	2400	1544 ± 138	64.33
Vitamin C (mg)	40	41.70 ± 6.80	104.25

Recommended Dietary Allowances; SD- Standard Deviation, The RDA for energy, protein and fat was reduced by 5% due to overweight

Conclusion

The present investigation was conducted on school going overweight adolescent girls (16-18 years) from district Kurukshetra, Haryana state, India. Meal skipping, more intake of junk foods, carbonated drinks were some of the unhealthy eating habits depicted among adolescent girls. The data also revealed that girls were consuming excess of energy, protein and fat but inadequate micronutrients like iron and beta-carotene, which may be one of the cause of girls being overweight. Therefore, it is necessary to promote healthy eating habits among adolescents and educate them about ill effects of junk food so as to prevent overweight/obesity and obesity related complications.

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