Original Research Article

A CROSS SECTIONAL STUDY TO ASSESS EFFECT OF JUNK FOOD CONSUMPTION ON OBESITY AMONG ADOLESCENT SCHOOL CHILDREN IN INDORE DISTRICT

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ABSTRACT

Background: The increasing prevalence and worsening health effects of junk food consumption have made it a major global public health concern. Even though its detrimental effects on health are common across all age groups, they are particularly high among teenagers in both developed and developing countries.[1] **Objective:** The study aims to evaluate the relationship between junk food consumption and obesity in adolescents aged 10 to 19 years, while also assessing their knowledge of the harmful effects of junk food on health.
Materials and Methods: 180 students participated in a cross-sectional study. Each student was given pretested semi structured questionnaire on junk food consumption after giving informed consent. Study was conducted in selected government and private school of Indore district among school going adolescent of age group (10-19 years) for duration of six months from July - December 2022. Data analysis was performed using SPSS version 25.0 (Trial version).
Results: The study sample consisted of 180 participants aged 10-19 years with mean height and weight of 1.54±0.15 and 53.88±11.18 respectively. Based on BMI 24.44% were overweight/Pre obese and 6.66% adolescents were obese. 59.44% students eat junk food and majority of them prefer salty snacks (66.21%), unhealthy food consumption in various BMI groups were noted and there were significant differences found i.e. salty snacks, sweetened beverages and fast-food consumption were found significant (p<0.05). 33.33% obese and 74.40% non-obese participants had adequate knowledge of harmful health effects of junk food consumption (p<0.05).
Conclusion: There has been a noticeable increase in adolescent obesity; therefore, schools, families and communities must address the dietary determinants of obesity. Health education in schools should encompass teaching students about healthy food habits. Parents should teach their children the importance of eating a balanced diet and to avoid junk food.
Keywords: Adolescent, Consumption, Junk food, Obesity, BMI.

INTRODUCTION

Junk food, also known as fast food, and has become increasingly popular in India. Globally, junk foods are popular stuff, and its consumption is increasing constantly. The increasing prevalence and worsening health effects of junk food consumption have made it major global public health concern.[1] Traditional foods have been nearly replaced by food items that can be found in a state of ready to eat, in canned form, and preserved for a longtime.[2] Advertisements on television, magazines, craze for trendy foods, convenience, mood, body image are

the factors that influence the food choices of adolescents.[3]

Nearly, 340 million children including adolescents were overweight or obese in the year 2016 which is increased over 390 million children and adolescents aged 5–19 years were overweight in 2022, including 160 million who were living with obesity.[4]

The prevalence of overweight and obesity among children and adolescents aged 5-19 years has risen dramatically from just 4% in 1975 to just over 18% in 2016 to 20% in 2022. The rise has occurred similarly among both boys and girls: in 2022 19% of girls and 21% of boys were overweight.[4,5,6]

While just 2% of children and adolescents aged 5–19 were obese in 1990 (31 million young people), by 2022, 8% of children and adolescents were living with obesity (160 million young people).[4]

Adolescent obesity is identified as an important risk factor for the development of various preventable non communicable diseases (NCD's) later in adulthood. Increased appetite and craving for salty, sweet and fried food, which, when consumed excessively, has a detrimental effect on the health of teenagers.[7] Healthy diet is essential in combating non-communicable disease like obesity.[8]

Recent data shows that obesity related non-communicable diseases are increasing in many developing countries with cross-sectional and secular trends of childhood obesity globally and more prevalent to developing countries.[9]

Rationale

Junk food consumption is the leading cause of obesity nowadays. Adolescent obesity is identified as an important risk factor for the development of various preventable non communicable diseases (NCD's).

Therefore, the current study tries to find out the effect of junk food consumption on obesity and awareness about its ill effects on health among adolescents.

Objectives

- **Primary objective:** To evaluate the relationship of junk food consumption and obesity among school going adolescent of age group (10-19 years).
- **Secondary objectives:** To assess the knowledge of harmful effects of junk food on health among adolescents.

MATERIALS AND METHODS

Study design: The study was a cross sectional study.

Study setting: The study was conducted in selected four government and private schools of Indore district.

Study period: Data was collected over a period of six months from July to December 2022.

Study subjects: The school going adolescent of age group (10-19 years) were included in the study.

Inclusion Criteria: Students who were agreed to participate in the study were included.

Exclusion Criteria: Students who were below 10 years and above 19 years were excluded.

Sample size: The sample size was calculated using the given formula **n=4pq/d²** with assumptions, that confidence interval was taken at 95%, prevalence (p) of junk food consumption among adolescents were taken from review of literature[1] was 60.30%, (q) was *39.70%*, a margin of error (d) was 7.5. Therefore, the calculated sample came out to be 163.42. After considering 10% non-response rate the final sample size came is 179.72≈180.

Sampling method: All the eligible participants present at the time of data collection and who have given consent are taken in the study.

Contents of the questionnaire– The questionnaire was constructed based on the review of previous studies regarding demographics, dietary habits and knowledge of harmful health effects due to eating junk food. BMI was calculated after taking height and weight measurements using standardised equipment and standard procedure.

Data collection tool- Data regarding demographics, dietary habits and knowledge of harmful health effects due to eating junk food and BMI of adolescents were collected by using pretested semi structured questionnaire by interview technique.

Data Analysis- Data was entered into Microsoft excel spread sheet and analyzed using SPSS version 25.0(Trial version). Appropriate test of significance like chi-square were applied whenever necessary. The p-value of less than 0.05 was considered significant.

Ethical approval- The study was approved by the Institutional Ethics Committee

Operational definition and specific description of variables used in the study-

Adolescent age group: Adolescence age group were considered from 10 to 19 years according to WHO guidelines[10].

Body mass index (BMI): The subjects were divided into various body mass index (BMI) groups using the conventional WHO classification of the World Health Organization (WHO)[11] labelled as: underweight (<18.5 kg/m^2), normal weight (18.5–24.9 kg/m^2), overweight (25–29.9 kg/m^2), and obese (≥ 30 kg/m^2). BMI was calculated using formula

$$\text{BMI= Weight in kg/Height in m}^2$$

Junk Food: Junk food includes instant noodles, biscuits, cookies, chips lays, chocolates, cake, ice cream, chow mien, Mo: Mo, samosa, soft drinks, Coke, Pepsi, Fanta, burgers, pizza, canned foods, fried potatoes, meat products, etc.

Junk Food Consumption: A student consumes at least one item of junk food for 3 days or more within the last 7 days[1].

Frequency of Consumption:

Mostly-It is the time that is more than 15 days in a month and more than 4 days in a week.

Often-It is the time that is 5–15 days in a month and 2–4 days in a week.

Sometimes-It is the time that is <5 days in a month and <2days in a week.

Knowledge: Participants who answered the right option among the given three questions in the questionnaire that were classified as adequate knowledge regarding the harmful effects of junk foods and others who did not answer right among the three were classified as inadequate knowledge.

RESULTS

Table 1 Represents among the study participants 51.7% were male and 48.3% were females. Maximum of them i.e. 85% were 14-16 yrs followed by 9.4% from 17-19 yrs and 5.55% from 10-13yrs of age. The mean height and weight of study participants were 1.54±0.15 and 53.88±11.18 respectively. On the basis of BMI calculations 17.77% were underweight, 51.11% were normal, 24.44% were overweight/Pre obese and 6.66% adolescents were obese. [Table 1]

According to table 2, among the participants, 59.44% consume junk food. Of these, 41.22% eat it oftenly, 36.45% consume it sometimes, and 22.43% mostly indulge in junk food. The majority of participants prefer salty snacks (66.21%), followed by fast food (61%), sweets and chocolates (30.40%), and sweetened beverages (34%).

40.19% ignore homemade food for junk food. By asking reasons for preference of junk food 47% participants answered that it is easy to find and same found it convenient and fast while 39.18% said that they like junk food, 30% found it affordable and 8.1% answered that their servings are large.

37.22% participants had freedom of purchasing junk food without their parent's permission. 56.11% adolescents found to have adequate knowledge about harmful effects of junk food on health. [Table 2]

Table 3 shows that, 50.0% obese and 30.95% non-obese like junk food, 66.67% obese and 36.90% non-obese said that it is easy to find, 41.66% obese and 38.09% non-obese adolescents found it convenient and fast, 50.0% obese and 22.61% non-obese found junk food affordable and 50.0% obese and 3.57% non- obese found their servings are large. [Table 3]

In the table 4, unhealthy food consumption in various BMI groups were noted and there were significant differences found i.e. salty snacks, sweetened beverages and fast-food consumption were found significant ($p<0.05$). [Table 4]

In table 5, 33.33% obese and 74.40% non-obese participants had adequate knowledge of harmful health effects of junk food consumption. These association was found significant ($p<0.05$). [Table 5]

Table 1: Descriptive analysis of Socio Demographic variables and Body Mass Index (N=180)

Parameter	Frequency	Percentage (%)
Age (Years)		
Early adolescent (10-13yr)	10	5.55
Middle adolescent (14-16yr)	153	85
Late adolescent (17-19yr)	17	9.4
Gender		
Male	93	51.7
Female	87	48.3
Weight (in kg)		
Mean±SD	53.88±11.18	
Height (in meters)		
Mean±SD	1.54±0.15	
Body Mass Index (BMI)		
Underweight (<18.5 kg/m^2)	32	17.77%
Normal (18.5–24.9 kg/m^2)	92	51.11%
Overweight/pre-obese (25–29.9 kg/m^2)	44	24.44%
Obese (≥30 kg/m^2).	12	6.66%
Mean±SD	22.61±4.85	

Table 2: Junk Food Consumption: Frequency, Types, Home Food ignorance, Reasons for Preferences, Purchasing Freedom, and Health Awareness (N=180)

Parameters	Frequency	Percentage
Status of Junk food consumption		
Yes	107	59.44%
No	73	40.56%
Frequency of Junk food consumption (n=107)		
Mostly	24	22.43%
Often	44	41.12%
Some times	39	36.45%
Type of Junk food consumed (n=107)		
Salty snacks	98	66.21%
Sweets/Chocolates	45	30.40%
Sweetened beverages	50	33.78%
Fast food	90	60.81%
***Multiple responses**		
Ignorance of homemade food (n=107)		

Yes	43	40.19%
No	64	59.81%
Reasons of preferences (n=107)		
Like junk food	58	39.18%
Its east to find, it is everywhere	60	47.29%
It is convenient and fast	69	46.62%
Affordable	39	29.72%
Serving is large	12	8.1%
*Multiple responses		
Freedom of purchasing junk food without parent's permission		
Yes	67	37.22%
No	113	62.77%
Knowledge about harmful effects on health		
Adequate	101	56.11%
Inadequate	79	43.88%

Table 3: Reasons of preferences of junk food among obese and non-obese adolescents (N=107)

Reasons	Obese (n=9)	Non obese (n=98)	p-value
Like junk food	6 (66.6%)	52 (53.06%)	0.435
Its east to find, it is everywhere	8 (88.80%)	62 (63.26%)	0.038
It is convenient and fast	5 (55.5%)	64 (65.30%)	0.562
Affordable	6(66.6%)	38 (38.77%)	0.0488
Serving is large	6 (66.6%)	6 (6.1%)	<0.0001

*Multiple responses

Table 4: Association of type of junk food items with obesity

Food items	Underweight	Normal	Pre obese	Obese	p-value
	Mean±sd	Mean±sd	Mean±sd	Mean±sd	
Salty snacks	3.49±2.41	3.75±2.79	4.53±3.84	6.89±5.87	0.011
Sweets/Chocolates	4.5±3.19	4.21±3.15	4.87±3.56	5.81±4.13	0.381
Sweetened beverages	2.79±2.51	5.01±2.97	5.89±3.89	8.69±5.31	<0.0001
Fast food	1.29±1.03	1.98±1.76	3.05±2.16	2.87±1.92	0.0001

Table 5: Association of knowledge of harmful health effects of junk food consumption with obese and non-obese adolescents (N=180)

Knowledge	Obese	Non- obese	Total	P value
Inadequate	8(66.67%)	43 (25.60%)	51 (28.33%)	
Adequate	4 (33.33%)	125 (74.40%)	129 (71.66%)	0.0023
Total	**12(100%)**	**168 (100%)**	**180 (100%)**	

DISCUSSION

Junk food consumption is on the rise among adolescents, leading to higher rates of obesity in this age group. This, in turn, increases their risk of developing lifestyle-related diseases later in life. Therefore, the current study tries to find out the effect of junk food consumption on obesity and awareness about its ill effects on health among adolescents.

In the present study, on the basis of BMI calculations 17.77% were underweight, 51.11% were normal, 24.44% were overweight/Pre obese and 6.66% adolescents were obese. In a study done by Kaur, P et. Al,[12] 57.3% adolescents of healthy weight followed by 23% overweight, 9.6% obese and 10% underweight and by Kapil et al,[13] who showed prevalence of obesity and overweight as 8.3% and 23.1% among boys and 1.4% and 24.7% among girls in Delhi respectively.[13]

59.44% adolescents consume junk food in present study, almost similar was found in study done by Bohara et. Al,[1] (60.3%). Whereas in study done by Kumar et al,[14] and Nisar et al,[15] prevalence of junk food consumption was found 68.3% and 97%

among adolescents of Karachi and Allahabad respectively.

In the present study, the majority of participants prefer salty snacks (66.21%), followed by fast food (61%), sweets and chocolates (30.40%), and sweetened beverages (34%). In a study done by Kaur, P et. Al,[12] carbonated soft drinks were the most preferred junk food item among 97.6% adolescents, one another study done by Ahmed et al,[16] revealed that 95.4% adolescents consumed junk food regularly in which carbonated soft drinks were taken by 86.9% of adolescents.

The reason of junk food consumption among majority, 47% was because it is easy to find and same found it convenient and fast while 39.18% said that they like junk food, 30% found it affordable and 8.1% answered that their servings are large in the present study. In the study done by Tariq et. Al,[17] the reasons were 68.58% like it, 23.0% found it easy and everywhere, 16.81% found it convenient and fast, 10.17% found it affordable and 7.9% found their servings are larger.[18] In another study done by Kaur, P et. Al,[12] the reason of junk food consumption among majority, (62.5%) was because they like the taste of junk food and by Meyers and

Wallace et. Al,[18] identified main factor for junk food consumption was taste and convenience.

56.11% adolescents found to have adequate knowledge about harmful effects of junk food on health. Much less was found in study done by Bohara et. Al,[1] (33.5%)

The present study indicated significant relationship of junk food consumption pattern with overweight and obesity. This was supported by findings of study done by Kaur, P et. Al,[12] Amin et. Al,[19] and Goyat Jp et at,[20] that shows overweight and obesity was significantly associated with frequent consumption of junk food.

CONCLUSION

The results from the study concludes that consumption of junk food among adolescents was found to be increasing their BMI and thus obesity. Family and peer roles were also found to be more influencing for junk food consumption. Regardless of adequate knowledge on harmful consequences of junk foods, school-going adolescents are consuming junk food due to its easy availability and ready to-use packaging. Therefore, schools, families and communities must address the dietary determinants of obesity. Health education in schools should encompass teaching students about healthy food habits. Parents also should teach their children the importance of eating balanced diet and to avoid junk food.

Conflicts of Interest: The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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