Research Article

Understanding the Pattern of Adolescents' Nutritional Behaviour and Lifestyle

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DOI: https://doi.org/10.24321/2349.2880.202301

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A B S T R A C T

Introduction: Junk food is increasingly becoming a part of the regular diet for most adolescents in India. Rich in fat and salt content, such food is known to cause nutritional, affective, behavioural, cognitive alterations. The present cross-sectional study thus aimed to understand the patterns of junk food consumption in school-going adolescents in India.

Method: A semi-structured, self-administered, pre-tested questionnaire, created by AACCI, was administered in a public co-ed school in central Delhi. The survey consisted of questions on knowledge and choice of junk food and healthy habits. The sample consisted of 140 participants, who were 10th and 11th graders.

Results: The foremost reason for choosing junk food was its taste in 78.8% of boys and in 72.3% of girls. There was no significant difference in the frequency of junk food consumption between girls and boys, however, their choices of food differed. Girls reported consuming more sweets (p = 0.034), while boys consumed more high-salt foods (p = 0.031) per week. Of the total boys (54%) and girls (46%), only 35% had a normal BMI.

Conclusion: The consumption of junk food by school-going adolescents was high. The study highlights the need for nutritional education and regulatory mechanisms to help students monitor their junk food consumption and the importance of promoting healthy food alternatives, health care habits in this population.

Keywords: Junk Food, Eating Habits, Nutritional Behaviour, Adolescents, School Children, Exercise

Introduction

Defined as food or drinks which have low nutritional value but are high in calorie content, junk food, also known as fast food, has become a part of our regular diet in today's world. This is particularly true for students, adolescents, young adults. Junk food forms a major percentage of consumed food in this population. The Indian Academy for Pediatrics proposed the term 'JUNCS' food, standing for Junk foods, Ultra-processed foods, nutritionally inappropriate foods, Caffeinated/ coloured/ carbonated foods/ beverages, Sugar-

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sweetened beverages, covering a variety of foods that are deemed unhealthy.[1]

Our dietary choices are not only related to our biological health, but also contribute to our cognitive, functional, emotional abilities. Junk food consumption is directly related to an increased risk of obesity, type 2 diabetes, hypertension, cardiovascular diseases.[2] It also causes nutritional deficiencies. Cognitively, junk food is known to affect memory and attentional resources. This was well documented in a 2017 controlled study by Attuquayefio et al.[3] which showed that the intake of food rich in fats and sugar content in the experimental group (mean age of 20 years) for 4 days significantly increased the participant's blood glucose levels, they had poorer scores on a list-learning task as compared to the control group. Junk food can transiently improve our mood by causing a release of dopamine, which is one of the main causes of junk food addiction.[4] However, routine consumption has been known to cause increased mental health concerns like sleep fluctuations, anxiety, sad mood, distress, impulsivity.[5]

With the Indian market becoming liberal in its food regulatory policies over time, there has been a massive influx of a variety of food and beverages, which given their constituent ingredients come under the umbrella of junk food and are easily accessible to children. A Delhi-based organisation tested the nutritional content of 33 popular Indian junk foods, including chips, namkeen, instant noodles, instant soup, burgers, fries, fried chicken, pizza, sandwiches, wraps. Their results showed dangerously high levels of salt in some very commonly consumed food brands.[6] In addition, the Food Safety and Standards Authority of India (FSSAI) recently introduced a proposal in September 2022, to include a star rating system for food items based on their ingredients. This has stirred a fierce debate among experts, as many suspect that such a system may falsely exaggerate the benefits of unhealthy food items, thus misleading consumers.[7]

Despite the government's policies on regulating junk food consumption among school students and awareness campaigns[8], a majority of children and adolescents continue to fancy and devour junk food, downplaying the potential immediate and long-term risks to their physical and mental health. Author Fuhrman in his 2018 article[9] uses the term "Fast Food Genocide" to highlight the severity of harm that children and adults continue to inflict on themselves as they ingest each morsel of one of these food items.

Given this, there is an immediate and urgent need to systematically understand the pattern of consumption among Indian children and adolescents in various parts of the country. This will help in building education and awareness strategies to help them make informed food choices.

Therefore, a pilot study was planned to assess Indian school-going students' nutritional behaviour and dietary choices in a Delhi-based school. The focal population was adolescents because of the increased frequency of junk food consumption among youngsters. Besides, Indian adolescents report lower self-efficacy in making choices about their fitness and diet.[10] The lifestyle habits acquired in this period of growth normally track into adulthood and are likely to set the base for consumption patterns ahead in life. The findings would thus help further empirical evidence about students' intake of junk food in Indian private and public schools, aid in guiding better alimentary and public healthcare policies.

Methodology

The Association of Adolescent and Child Care India (AACCI) conducts awareness programmes in schools for promoting an understanding of the importance of having a healthy lifestyle which includes choice of healthy food and understanding and reading labels on processed and packaged food.

Following a healthy diet can play a huge role in preventing non-communicable diseases like obesity, hypertension, diabetes, more. For this study, a school was approached with the proposal to conduct an awareness programme. Parental consent was obtained, surveys were carried out to understand the food and exercise habits of the students. Results were shared with the school authority, students, parents.

Study Design

This is a cross-sectional study. The students were contacted in their school class, all data from a single site was collected on the same day.

Study Duration

July to August 2016

Sample

Exclusion Inclusion Criteria: There were no exclusion criteria all 140 (15-16 yrs) children studying in 10th and 11th standard in this co-ed medium school were included in the study. The classes were allotted by the principal.

Consent: Written assent of children was taken while filling the forms parental permission was taken through the principal who permitted the study.

Tool

A pre-tested self-report questionnaire containing questions about students' knowledge of food, eating habits, lifestyle factors created by the AACCI team was administered.

Ethical Clearance: This study was approved by the institutional ethics committee of AACCI.

Statistical Analysis

SPSS 21 was used for analysis of the data.

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Results

Sample Characteristics

All students (n = 140) from the 10th and 11th grades in a private school in Delhi were surveyed. The mean age of participants was 16.24 years (SD = ± 0.695). There were 75 (54%) boys and 65 (46%) girls. In terms of dietary preferences of those included, 66% (n = 93) were vegetarians, 34% (n = 47) were non-vegetarians (p = 0.949).

Body Mass Index

From the total sample, 35% had normal BMI (BMI = 18-23), 23.6% were undernourished (BMI ≤ 18.5), 29% were overweight (BMI ≥ 28) and 12% were obese. None had BMI > 40. Gender comparison of BMI was not statistically significant (p = 0.938).

Frequency of Junk Food Intake

There were no statistical differences between boys and girls in the number of meals per day and the frequency of junk food consumption per week.

Frequency and Types of Junk Food Consumed

Students' junk food preferences and frequency of consumption were surveyed. It was found that there was a statistically significant difference between girls and boys in the consumption of three types of junk food: sweets, sugary beverages, high-salt food. Firstly, girls reported having sweets (p = 0.034) and sugary beverages (p = 0.0003) 0-1 times a week. Whereas boys were significantly more likely to consume sugary beverages and high-salt food more than 7 times a week than girls (p = 0.01).

Other patterns of consumption also emerged. A majority of girls (50.8%) reported consuming fried food 2-3 times a week. Whereas boys consumed more junk food across all categories as compared to girls.

Healthy Dietary Habits: Students were asked to report how often they ate fruits and salads per week. Girls (30.8%) consumed salads marginally more than boys (25.3%) 2-3 times a week. Surprisingly, 10 (15%) girls and 12(16%) boys had breakfast only once a week, 16 (24%) girls and 12 (16%) boys had it only 2-3 times in a week.

Exercise: There were significant differences in the frequency of walking and using bicycles among girls and boys. More girls reported walking and using bicycles than boys 2-3 times a week (p = 0.008). However, more boys reported walking and using bicycles more than 7 times a week compared to girls (p = 0.036). Additionally, 21 (32%) girls and 18 (24%) boys reported exercising only 2-3 times a week, some even less.

Unhealthy habits: Most girls and boys watched television more than 4 times per week.

Table 1.Gender and Body Mass Index (BMI) (N = 140) (Girls = 65, Boys = 75)

BMI	< 18.5	18.5 - 23	23.1 - 27.5	27.65 - 40	> 40	p Value
	Undernourished n (%)	Normal n (%)	Overweight n (%)	Obese n (%)	Morbid obesity n (%)	
Girls (N = 65)	15 (23.1)	23 (35.4)	18 (27.7)	9 (13.8)	0 (0.0)	0.938
Boys (N = 75)	18 (24.0)	26 (34.7)	23 (30.7)	8 (10.7)	0 (0.0)	
Total (N = 140)	33 (23.6)	49 (35)	41 (29.3)	17 (12.1)	0 (0.0)	

\# Indicates fisher exact test at 5% level (used when we have less than 5 entries in any cell)

Table 2.Frequency of Meals and Junk Food (N =140) (Girls = 65, Boys = 75)

No. of Meals/ Day	Once		Twice		Thrice		Four times		≥ 5 times	
	Girls n (%)	Boys n (%)	Girls n (%)	Boys n (%)	Girls n (%)	Boys n (%)	Girls n (%)	Boys n (%)	Girls n (%)	Boys n (%)
	0 (0.0)	1 (1.3)	11 (16.9)	11 (14.7)	40 (61.5)	38 (50.7)	12 (18.5)	20 (26.7)	2 (3.1)	5 (6.7)
	p = 0.999#		p = 0.714		p = 0.196		p = 0.249		p = 0.567#	
Junk food/ week	20 (30.7)	29 (38.7)	22 (33.8)	21 (28.0)	10 (15.4)	11 (14.7)	5 (7.7)	6 (8.0)	8 (12.3)	8 (10.7)
	p = 0.328		p = 0.454		p = 0.905		p = 0.946		p = 0.76	

\# Indicates fisher exact test at 5% level (used when we have less than 5 entries in any cell)
* Denotes significant p values (< 0.05)

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Table 3.Frequency and Types of Junk Food (N = 140) (Girls = 65, Boys = 75)

No. of Times/Week	> 7 Times/Week		4-6 Times/Week		2-3 Times/Week		0-1 Time/Week	
Types of junk food	Girls n (%)	Boys n (%)	Girls n (%)	Boys n (%)	Girls n (%)	Boys n (%)	Girls n (%)	Boys n (%)
Packaged food	1 (1.5)	3 (4.0)	4 (6.2)	7 (9.3)	22 (33.8)	33 (44.0)	38 (58.5)	32 (42.7)
p values	p = 0.731#		p = 0.70#		p = 0.22		p = 0.06	
Fried food high fat	1 (1.5)	2 (2.7)	4 (6.2)	12 (16.0)	33 (50.8)	31 (41.3)	27 (41.5)	30 (40.0)
p values	p ≥ 0.999#		p = 0.114#		p = 0.264		p = 0.853	
Baked products	1 (1.5)	4 (5.3)	7 (10.8)	6 (8.0)	17 (26.2)	26 (34.7)	40 (61.5)	39 (52.0)
p values	p ≥ 0.999#		p = 0.573		p = 0.277		p = 0.257	
Sugary drinks	7 (10.8)	21 (28.0)	23 (35.4)	27 (36.0)	18 (27.7)	24 (32.0)	17 (26.2)	3 (4.0)
p values	p = 0.01**		p = 0.939		p = 0.579		p = 0.0003***	
Sweets-high sugar	3 (4.6)	5 (6.7)	11 (16.9)	13 (17.3)	16 (24.6)	30 (40.0)	35 (53.8)	27 (36.0)
p values	p = 0.883#		p = 0.948		p = 0.053		p = 0.034*	
High salt foods	1 (1.5)	9 (12.0)	11 (16.9)	14 (18.7)	31 (47.7)	34 (45.3)	22 (33.8)	18 (24.0)
p values	p = 0.031#*		p = 0.788		p = 0.780		p = 0.198	

# Indicates fisher exact test at 5% level (used when we have less than 5 entries in any cell)
Significant p values-* < 0.05, ** < 0.01, *** < 0.001

Table 4.Healthy and Unhealthy Habits (N = 140) (Girls = 65, Boys = 75)

No. of Times/Week	> 7		4-6 Times/Week		2-3 Times/Week		0-1 Time/Week	
Food-related Habits	Girls n (%)	Boys n (%)	Girls n (%)	Boys n (%)	Girls n (%)	Boys n (%)	Girls n (%)	Boys n (%)
Salads	11 (16.9)	23 (30.7)	21 (32.3)	23 (30.7)	20 (30.8)	19 (25.3)	13 (20.0)	10 (13.3)
p values	p = 0.058		p = 0.347		p = 0.474		p = 0.289	
Fruits	19 (29.9)	28 (37.3)	28 (43.1)	25 (33.3)	12 (18.5)	17 (22.7)	6 (9.2)	5 (6.7)
p values	p = 0.313		p = 0.236		p = 0.540		p = 0.573	
Breakfast	26 (40.0)	29 (38.7)	13 (20.0)	22 (29.3)	16 (24.6)	12 (16.0)	10 (15.4)	12 (16.0)
p values	p = 0.872		p = 0.203		p = 0.204		p = 0.920	
Exercise-related habits								
Exercise for at least 30 min/day	14 (21.5)	19 (25.3)	10 (15.4)	23 (30.7)	21 (32.3)	18 (24.0)	20 (30.8)	15 (20.0)
p values	p = 0.597		p = 0.033*		p = 0.275		p = 0.142	
Walk or use bicycle	13 (20.0)	25 (33.3)	20 (30.8)	29 (38.7)	23 (35.4)	12 (16.0)	9 (13.8)	9 (12.0)
p values	p = 0.036*		p = 0.328		p = 0.008**		p = 0.744	
Unhealthy habits								
Watch TV	17 (26.2)	18 (24.0)	27 (41.5)	27 (36.0)	17 (26.2)	26 (34.7)	4 (6.2)	4 (5.3)
p values	p = 0.769		p = 0.502		p = 0.277		p ≥ 0.999#	

# Indicates fisher exact test at 5% level (used when we have less than 5 entries in any cell)
Significant p values-* < 0.05, ** < 0.01

Knowledge of Junk Food

Most girls and boys had an understanding of chemicals in food and their safety levels and were aware of their harmful effects. About one-third of girls and boys reported that junk food is addictive in nature.

Factors Influencing Intake of Junk Food

A major reason for choosing junk food was taste in 78.8 % of boys and 72.3% of girls. The influence of advertisements was very low in this sample but was seen more in girls (6.2%) as compared to boys (1.3%).

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Table 5. Knowledge of Junk Food (N = 140) (Girls = 65, Boys = 75)

Knowledge Areas	Yes		No		Don't Know	
	Girls n (%)	Boys n (%)	Girls n (%)	Boys n (%)	Girls n (%)	Boys n (%)
Knowledge about chemicals in food and their safety levels	47 (72.3)	57 (76.0)	7 (10.8)	8 (10.7)	11 (16.9)	10 (13.3)
p values	p = 0.618		p = 0.984		p = 0.553	
Harmful effects of the chemicals	42 (64.6)	49 (65.3)	15 (23.1)	15 (20.0)	8 (12.3)	11 (14.7)
p values	p = 0.929		p = 0.658		p = 0.684	
Is junk food healthy?	5 (8.0)	14 (18.8)	51 (78.5)	51 (68.0)	9 (13.8)	10 (13.3)
p values	p = 0.058		p = 0.165		p = 0.929	
Is junk food addictive? (makes you eat more)	33 (50.8)	28 (37.3)	14 (21.5)	33 (44.0)	18 (27.7)	14 (18.7)
p values	p = 0.109		p = 0.005**		p = 0.205	

\# Indicates fisher exact test at 5% level (used when we have less than 5 entries in any cell)
Significant p values-** < 0.01

Table 6. Factors Influencing Junk Food Intake N = 140) (Girls = 65, Boys = 75)

Factors	Girls n (%)	Boys n (%)	Total n (%)	p Value
Time	4 (6.2)	8 (10.7)	12 (8.0)	0.520#
Taste	47 (72.3)	59 (78.7)	106 (75.7)	0.381
Changing lifestyles	10 (15.4)	7 (9.3)	17 (12.1)	0.275
Influence of advertisements	4 (6.2)	1 (1.3)	5 (3.0)	0.283#

\# Indicates fisher exact test at 5% level (used when we have less than 5 entries in any cell)

Discussion

The current study attempted to understand adolescents' dietary habits with regard to junk food intake and assess their knowledge of its nutritional value and their food and lifestyle choices. The goal was to analyse the current trends around junk food consumption and the health habits of students, so as to help develop better educational and awareness programmes, promoting healthier food choices. The results brought forth certain key areas of consideration.

First, the findings highlight that the majority of adolescents were in the underweight, overweight or obese categories. Only 35% of students surveyed had a healthy BMI. 23.6% were undernourished (BMI ≤ 18.5), 29% were overweight (BMI ≥ 28) and 12% were obese. (Table 1) This shows the need to conduct interventions where children are taught about the importance of having a healthy BMI, how it can be achieved through healthy eating and exercise.

With regard to junk food consumption, it was clear that the majority of the students consumed junk food at least once a week (Table 2). There were no significant gender-based differences in the frequency of junk food intake. However, there were differences between boys and girls in their choice of junk food. A majority of the students reported eating out at least 2-3 times a week. Additionally, it was seen that consumption of High Salt (HS), High Sugar (HS), High-Fat food (HF), Sugar-Sweetened beverages (SSS) was high (Table 3). Consumption of unhealthy foods that are high in sugar and salt can increase the risk of non-communicable diseases like obesity, type 2 diabetes, cardiovascular diseases.[12-14]

Interestingly, as noted in Table 3 and Table 4, boys consume junk foods more frequently as compared to girls. Boys are more likely to have sugary drinks and high-salt foods, but also exercise more. Other differences also emerged related to exercise. There were differences between boys and girls in terms of how often they would walk or ride bicycles. Boys reported more likelihood of walking and using bicycles.

This difference in the kinds of junk food both genders endorse, their health habits is intriguing, perhaps points towards the direction of what society and peers generally accept and encourage for each of the groups. Studies done with Indian adolescents have shown that some of the factors that deter them from exercising are safety concerns, lack of encouragement for female students, lack of access to outdoor space, competing priorities.[15]

A significant number were aware of healthy food habits (70.8% girls and 58.7% boys), avoiding having junk food

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for breakfast, not adding extra salt to their food (60% girls and 60% boys) (Table 5), yet, many reported that they do consume junk in some form or the other, most often for its taste (Table 6). Thus, adolescents appear to be making unhealthy food decisions in spite of knowing about the harmful effects that it can have.

Specifically, about half of the girls and boys in the study reported having breakfast only 0-3 times a week (Table 4). In the workshops conducted by AACCI on healthy lifestyle, a large number of children report not having a healthy breakfast, reasoning it with a lack of time in the morning. Some also report not feeling hungry early in the day or a general dislike for breakfast.

These findings suggest that interventions are necessary to change existing patterns among adolescents. It is important to educate students about the type of impact that junk food can have. Raising their self-efficacy about making healthy dietary choices is key, school-based life-skills programmes can be beneficial. Students also need to be informed about healthier alternatives to junk food. Besides, families can be coached to make healthier meals tasty, thus encouraging their consumption. As Dsouza and Dsouza[16] found in their recent study with South Indian high school students, most adolescents consume fast foods predominantly with their friends, followed by with families. Thus, introducing a peer buddy system to check on each other's junk food intake, discourage it would eventually promote a more regulated consumption habit.

Limitation of the study

Generalisation and validation of study results needs further multicentric or large cohort study.

Conclusion

The study revealed the views of students related to junk food including consumption habits and nutritional preferences. The results highlight the immediate need to promote better food and lifestyle choices among adolescents. Including nutritional education in school curriculum could promote healthier habits and more informed decisions regarding food intake. Along with this, continuous monitoring of students' consumption patterns and providing counselling support can play a crucial role in helping students build holistic and healthier lifestyles.

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