Fast Food Consumption and BMI in Urban 'Adolescent Girls' of Muzaffarpur District, Bihar

[1]Dr. Jayashree, [2]Dt. Priyanka Raj, [3]Dr. Kusum Kumari, [4]Dr. Sangeeta Rani,
[5] Dr. Vidisha Mishra, [6]Dr. Shweta Priyadarshini, [7]Dr. Renu Kumari

[1]Assistant Professor, Department of Home Science,
R.B.B.M. College (A Constituent Unit of B.R.A. Bihar University, Muzaffarpur, Bihar)

[2]M.Sc. in Clinical Nutrition & Dietetics, Galgotias University, Greater Noida, Uttar Pradesh.

[3]Professor, University Department of Home Science, B.R.A. Bihar University, Muzaffarpur, Bihar.

[4]Professor, University Department of Home Science, B.R.A. Bihar University, Muzaffarpur, Bihar.

[5]Assistant Professor (Senior Scale), University Department of Home Science, B.R.A. Bihar University, Muzaffarpur, Bihar.

[6]Assistant Professor, University Department of Home Science, B.R.A. Bihar University, Muzaffarpur, Bihar.

[7] Professor, University Department of Home Science, B.R.A. Bihar University, Muzaffarpur, Bihar.

Abstract: Consumption of fast food is emerging as a potential threat to the physical and mental health of adolescent girls. To assess the nutritional status, BMI, and prevalence of fast-food consumption habits of urban adolescent girls of Muzaffarpur district, Bihar, and their awareness of the adverse health effects associated with fast food. Additionally, fast food culture is a rapidly rising trend among youngsters. The stressful life caused by an increased study load negatively influences the food choices of students. This cross-sectional survey was conducted among 257 unmarried adolescent girls (16-19 years) attending government colleges in the urban population of Muzaffarpur Municipal Area, Bihar. The study used a two-day 24-hour dietary recall approach and a food frequency questionnaire to assess fast food consumption and nutritional intake. Anthropometric measurements were taken to calculate BMI and compare results to benchmarks. It is a measurement of relative physical fitness that can be calculated using height (in meters, barefoot) and weight (in kilograms). BMI = Weight (kg) / Height(m^2). Data analysis involved using percentages and averages to identify key findings. The socioeconomic distribution reveals a majority in middle and high-income brackets, suggesting socioeconomic factors likely influence BMI distribution. There is an awareness gap regarding the effects of fast-food consumption which indicates a need for educational campaigns.

Keywords: Health, Nutrition, BMI, Overweight, Adolescent.

1. INTRODUCTION

Fast food is essentially defined as high-calorie food deficient in micronutrients like fiber, minerals, vitamins A and C, and amino acids. The nutrients that the body requires to stay healthy are absent from these meals. Because of its indigestible, carcinogenic, and harmful colourings, it has low nutritional value and is regarded as unhealthy(Palos Lucio et al.).

The widespread consumption of junk food in our societies is consistently blamed for the obesity and overweight rates among adolescents. The new processed foods that have been introduced to the market with more varied tastes and acceptability for children and teenagers who have diverged their eating patterns, as well as the current supportive environments that limit organic foods. It has played a major role in the users' growth disparities and health problems(Li et al.)

According to (Subhalakshmi and Dhanasekar; Vishal et al.) Fast food can negatively impact your health. For example, junk food's additional fats, processed grains, salt, added sugars, and sweeteners raise the risk of obesity. Numerous health issues that can seriously impair your quality of life are caused by obesity. Food's additional fats, processed carbohydrates, salt, added sugars, and sweeteners raise the risk of obesity. Numerous health issues that can seriously impair your quality of life are caused by obesity

Due to the increasing incidence and worsening health effects of junk food intake, it has become a serious global public health problem. While its detrimental effects on health are common throughout all age groups, children and adolescents are particularly vulnerable, Junk food consumption among teenagers enrolled in both private and public Colleges was extremely high. Teenagers enrolled in colleges continue to consume junk food despite having a sufficient understanding of its negative effects since it is readily available and comes in convenient packaging in this study 60% of the adolescents were found eating junk food(Bohara et al.). Schools, families, and communities need to address the dietary causes of obesity since the rate at which teenage obesity is increasing is concerning. Children's health should be regularly monitored and good eating habits should be taught as part of school health services. To stop non-communicable illnesses from developing in their children at an early age, parents must understand the importance of a balanced diet, steer clear of junk food, and make sure their children are getting enough fruits and vegetables(Grace et al.).

The World Health Organisation (WHO) defines overweight and obesity as abnormal or excessive fat accumulation that poses a health risk. The body mass index (BMI), computed by dividing body weight in kilograms by height in meters squared, is a basic statistic used to assess overall body fat. The US Centres for Disease Control and Prevention (CDC) and the World Health Organisation (WHO) define a normal BMI range for adults as 18.5 to 24.9 kg/m^2. BMI $\geq$ 25 kg/m^2 is considered overweight, a BMI $\geq$ 30 kg/m^2 is categorized as obese, and severe obesity is defined as a BMI $\geq$ 40 kg/m^2(Chooi et al.). According to NHFS 5 data of Bihar shows that there is 3.3 % of females from the age group of 15 to 49 years are overweight in terms of obesity and overweight Bihar top, most districts are Begusarai, Aurangabad, Patna, and Siwan, with which highest burden districts being Patna and Siwan.

Adolescent obesity is a very widespread problem in our society. According to recent research, this is a type of global load that may predispose people in their later years to a variety of ailments. Adolescents are a good force for a country, accountable for their future prosperity as well as the nations(Seema et al.).

Adolescent girls are a vulnerable segment of the Indian population, accounting for roughly one-tenth of the total. Obesity, like other nutritional status, is known to decrease immune function by affecting leukocyte count and cell-mediated responses, resulting in organ damage. Not only does it cause physiological repressions, but it also has substantial psychological consequences that can harm intellect and personality. These concerns affect just both developed and developing countries. This new drifting concern led to various consequences in both adolescence and adult life, especially an increased rate of coronary artery disease, hypertension, diabetes, dyslipidaemia, obstructive sleep apnoea, oesophageal reflux & gastric emptying disturbances, osteoarthritis & flat feet, psychological dysfunction, self-esteem & social isolation, and an overall increase in morbidity and mortality in later life(Thomas et al.).Obesity is an epidemic that affects people of all ages, genders, and ethnicities. It requires immediate control and management. Cardiovascular problems are a global threat as obesity incidence rises rapidly; by 2025, it is anticipated to reach up to 18% in men and 21% in women, imposing a significant cost on individuals, societies, and healthcare systems. According to the journal of the European Society of Cardiology, heart attack survivors who have excess fat around their waist have a higher risk of experiencing recurrent cardiac arrest(S et al.).

Seema et al. (2021) found a strong link between gender, socioeconomic position, dietary habits, chocolate consumption habits, method of transportation to school, sports participation, physical activity, and screen time. Adolescents who spent more than 2 hours on screens were more obese, and these were only a few of the factors contributing to teenage obesity. According to Science Daily (2019), increased cell phone and television use, a more sedentary lifestyle, and a decrease in physical exercise may all be risk factors for teenage obesity.

Recent research has revealed that more income is related to a higher risk of eventual obesity in low- and middle-income nations, whereas in high-income countries, the association is reversed: higher-income persons have a lower risk of obesity(Andoy-Galvan et al.).

(Payab et al.) research showed that, despite documented evidence of the detrimental effects of junk foods on the human body, junk food consumption is popular among young people. Obesity, diabetes, hypertension, and coronary heart disease are all possible outcomes of such intake. Adolescent obesity poses numerous health hazards, including hypertension, pulmonary disease, orthopaedic diseases, diabetes, and high blood cholesterol levels.

It's been found that those from lower socioeconomic backgrounds eat less produce, meat, and fish and more calorie-dense items. This suggests that when financial stability is threatened, micronutrient consumption suffers more than macronutrient consumption. A healthy diet that supports the appropriate mineralization of bones and the development of new tissues is especially important throughout adolescence. Calories and nutrients including protein, calcium, iron, folic acid, and zinc are especially important throughout puberty. Adolescents have unique nutritional needs, and iron and calcium are two of the most crucial (Hassan et al.).

The rise in obesity prevalence in recent decades has been significantly impacted by modifications to the larger obesogenic environment. The family (for example, modelling physical activity, eating habits, sleep patterns, and screen time), the local community (for example, child care facilities and schools, parks, green spaces, public transportation, and food establishments),other larger socio-political environment (for example, government regulations, the food industry, food marketing, transportation networks(Jebeile et al.).

2. METHODS

This cross-sectional survey was conducted among 257 unmarried adolescent girls (16-19 years) attending government colleges in the urban population of Muzaffarpur Municipal Area, Bihar. The study used a two-day 24-hour dietary recall approach and a food frequency interview schedule to assess fast food consumption and nutritional intake. Measurements of height and weight are used in anthropometry to determine BMI and compare results to benchmarks. It is a measurement of relative physical fitness that can be calculated using height (in meters, barefoot) and weight (in kilograms).Data analysis involved using percentages and averages to identify key findings.

BMI = Weight (kg) / Height (m^2).

WHO CLASSIFICATION OF WEIGHT STATUS	
WEIGHT STATUS	**BODY MASS INDEX (BMI), kg/m^2**
Underweight	<18.5
Normal range	18.5 – 24.9
Overweight	25.0 – 29.9
Obese	≥ 30
Obese class I	30.0 – 34.9
Obese class II	35.0 – 39.9
Obese class III	≥ 40

Source: World Health Organization (WHO) 1995

3. RESULTS

Table. 1: Distribution of the participants according to their socio-economic status

Income group	Frequency	Total (%)
High-income group	111	43
Middle-income group	137	53
Low income	9	04
Total	257	100

Table 1 shows 43% of respondents belong to the high-income group.

53% are in the middle-income group, while only 4% fall into the low-income category.

The distribution reveals a majority in middle and high-income brackets, suggesting socioeconomic factors likely influence BMI distribution. Targeted health initiatives may benefit lower-income groups to address potential disparities in health outcomes.

Table 2: Distribution of the Respondents according to their Body Mass Index (BMI)

BMI Category	Range (BMI Kg/m^2)	Frequency	Percentage (%)
Normal	18.5-24.9	156	60.8
Overweight	25-29.9	96	37.4
Obesity grade 1	30-34.9	04	1.5
Grade 2 obesity	35-39.9	01	0.3
Grade 3 obesity	>40	00	00
Total		257	100

Table 2 shows results that the majority (60.8%) of respondents had a normal BMI (18.5-24.9). 37.4% were overweight (25-29.9).Very few had obesity grade 1 (1.5%) or grade 2 (0.3%); none had grade 3.

The study indicates a predominantly normal BMI distribution among respondents, highlighting the need for targeted interventions to prevent overweight and obesity.

Table 3: **Distribution of the Respondents according to their knowledge regarding fast food**

Awareness of Fast-food Consumption	Number	Percentage (%)
No awareness	70	27.2
Certain	44	17.1
Absolutely	143	55.7
	257	100

Table 3 shows that 27.2% of respondents had no awareness of fast-food consumption and its health effects 17.1% were uncertain, and 55.7% were aware.

The data highlights a significant awareness gap among respondents regarding the impact of fast-food consumption. With only 55.7% demonstrating clear awareness, there's a need for targeted educational campaigns to enhance understanding of dietary choices. Addressing this gap could potentially mitigate health risks associated with excessive fast-food intake, promoting better dietary habits and overall well-being among the population surveyed.

Table 4: Distribution of the Respondents according to their opinion about food preferences and its consumption pattern

Food Preferences	Food Items	No. of Respondents	Percentage (%)
Fast food preferred	Burger	23	8.7
	Pizza	63	24.6
	Chowmein	22	8.6
	Pasta	12	4.7
	Pastries	10	3.8
	Samosa	34	13.2
	Momos	16	6.3
	Sandwiches	7	2.7
	Others	70	27.4
Preferred beverages with fast food	Carbonated drinks	66	25.8
	Milkshake	16	6.1
	Tea/ coffee	34	13.2
	Mineral water	39	15.3
	Not applicable	102	39.6
Frequency of fast-food consumption	<1 time a week	19	7.3
	1-2 times a week	160	62.4
	3-4 times a week	51	19.7
	More than 5 times a week	20	7.8
	0 times	7	2.8

Time of consumption of fast food	Breakfast	27	10.5
	Lunch	96	37.5
	Evening	37	14. 4
	Dinner	84	32.7
	Not applicable	13	4.9
Thinking about fast food	Healthy	35	13.7
	Unhealthy	22	8.7
	Tasty	119	46.2
	Pleasuring	15	5.7
	Interesting	50	19.3
	Not applicable	16	6.4

Table 4. Shows among 257 respondents, 62.4% consumed fast food 1-2 times a week, 19.7% consumed it 3-4 times a week, and 7.8% ate fast food more than 5 times a week. Meanwhile, 2.8% did not eat fast food at all. Pizza was the top ordered fast food at 24.6%, and 25.8% of respondent's preferred carbonated drinks as their beverage. Additionally, 37.5% of respondents preferred fast food during lunchtime.

Fast food was perceived as tasty (46.2%) but unhealthy by (8.7%) respondents.

Despite recognizing health risks, taste remains a primary motivator. Strategies promoting healthier fast-food options and educating about balanced diets are crucial to mitigate health impacts associated with frequent consumption of fast food and sugary drinks.

Table 5: Distribution of the Respondents according to their style of living.

Style of living	Response	Frequency	Percentage (%)
Participation in outdoor sports	Yes	68	26.4
	No	189	73.6
Eating snacks while watching TV	Yes	206	80. 1
	No	51	20.
Time spent on watching TV	< 1 hour	53	20.6
	1-2 hour	138	53.6
	3-4 hour	64	25.4

The data of table 5 show that 80.1% of people eat snacks while watching TV, while 20% do not. Regarding TV watching time, 53.6% watch 1-2 hours, 25.4% watch 3-4 hours, and 20.6% watch less than 1 hour. Additionally, 73.6% of people do not participate in outdoor sports, while 26.4% do. Most people prefer TV over outdoor sports and often snack while watching.

4. DISCUSSION

The income distribution revealed that 43% of respondents were in the high-income group, and 53% were in the middle-income group(Hassan et al.). Found that 52.9% of adolescents were from the middle class, which is consistent with our findings. Socioeconomic status likely plays a role in dietary choices and BMI, as higher income groups might have better access to healthier food options and healthcare.

The study's results are consistent with findings from another research in the field:

BMI Distribution and Socioeconomic Factors:

A majority (60.8%) of respondents had a normal BMI, while 37.4% were overweight, with very few having obesity grade 1 (1.5%) or grade 2 (0.3%). This distribution aligns with(Bohara et al.), which indicated a high consumption of junk food leading to increased BMI.

Awareness and Consumption of Fast Food:

27.2% of respondents had no awareness of the effects of fast-food consumption, while 55.7% were aware. This suggests a gap in awareness, supporting findings by (Kumari and Kumari), who noted a lack of knowledge about junk food.

Despite awareness, the preference for fast food and sugary drinks was high, with 62.4% consuming fast food 1-2 times weekly(Vishal et al.; Shree et al.) also reported high fast-food consumption among participants, with many substituting it for regular meals.

The study revealed that fast food is perceived as tasty but unhealthy, which is consistent with findings by (Saba Tariq et al.; Latif et al.) who noted that taste, convenience, and lack of time drive fast-food consumption despite awareness of its negative health impacts.

5. RECOMMENDATIONS

Targeted Interventions:

Develop and implement targeted health initiatives to prevent overweight and obesity, focusing particularly on middle and high-income groups who may have the means but not necessarily the knowledge to make healthier choices.

Create educational campaigns aimed at increasing awareness about the health risks associated with fast food and promoting balanced diets. These campaigns should address the specific gaps identified, such as the lack of awareness among 27.2% of respondents.

Promoting Healthier Options:

Encourage fast-food chains to offer healthier options and promote these choices through marketing and menu placements.

Support policies that reduce the availability and appeal of unhealthy fast-food options, such as taxation on sugary drinks and incentives for healthier food choices.

Further Research:

Conduct longitudinal studies to examine the long-term effects of socioeconomic status and awareness on fast-food consumption patterns and BMI.

Investigate the effectiveness of different intervention strategies in reducing fast-food consumption and improving dietary habits among various socioeconomic groups.

In conclusion, the interplay between socioeconomic factors, awareness, and fast-food consumption is complex and requires multifaceted approaches to address the associated health risks. By leveraging targeted interventions, educational campaigns, and policy changes, it is possible to promote healthier dietary habits and improve overall well-being.

6. CONCLUSION

The study presents a predominantly normal BMI distribution among respondents with a significant proportion being overweight. This highlights the need for targeted interventions to prevent overweight and obesity. The socioeconomic analysis reveals a majority of respondents in middle and high-income brackets, suggesting that socioeconomic factors likely influence BMI distribution. Furthermore, the significant awareness gap regarding the effects of fast-food consumption indicates a need for educational campaigns. Although most respondents find fast food tasty, many recognize it's unhealthiest. Thus, promoting healthier fast-food options and educating the public about balanced diets are crucial to mitigating health impacts.

REFERENCES

[1]   Andoy-Galvan, Jo Ann, et al. "Income and Obesity in an Urban Poor Community: A Cross-Sectional Study." F1000Research, vol. 9, Mar. 2020, p. 160, doi:10.12688/f1000research.22236.1.

[2]   Bohara, Suraj Sujan, et al. "Determinants of Junk Food Consumption Among Adolescents in Pokhara Valley, Nepal." Frontiers in Nutrition, vol. 8, Apr. 2021, doi:10.3389/fnut.2021.644650.

[3]   Chooi, Yu Chung, et al. "The Epidemiology of Obesity." Metabolism, vol. 92, Mar. 2019, pp. 6–10, doi:10.1016/j.metabol.2018.09.005.

[4]   Grace, GAngeline, et al. "Dietary Habits and Obesity among Adolescent School Children: A Case Control Study in an Urban Area of Kancheepuram District." Indian Journal of Community Medicine, vol. 46, no. 4, 2021, p. 637, doi:10.4103/ijcm.IJCM_1013_20.

[5] Hassan, Asmaa, et al. "Knowledge and Attitudes of Students toward Fast Food in Assiut University." Assiut Scientific Nursing Journal, vol. 9, no. 24.0, 2021, pp. 65–75, doi:10.21608/asnj.2021.62343.1127.

[6] Jebeile, Hiba, et al. "Obesity in Children and Adolescents: Epidemiology, Causes, Assessment, and Management." The Lancet Diabetes & Endocrinology, vol. 10, no. 5, May 2022, pp. 351–65, doi:10.1016/S2213-8587(22)00047-X.

[7] Kumari, Ruchi, and Mamta Kumari. "Factors Affecting the Choice of Fast Food among Teenagers of Sabour Block in Bhagalpur District of India." The Pharma Innovation, vol. 9, no. 10, Oct. 2020, pp. 211–16, doi:10.22271/tpi.2020. v9.i10c.5230.

[8] Latif, Samreen, et al. "Junk Food Consumption in Relation to Menstrual Abnormalities among Adolescent Girls: A Comparative Cross Sectional Study." Pakistan Journal of Medical Sciences, vol. 38, no. 8, Oct. 2022, doi:10.12669/pjms.38.8.6177.

[9] Li, Yanxia, et al. "How Do Perceived Health Threats Affect the Junk Food Eating Behavior and Consequent Obesity? Moderating Role of Product Knowledge Hiding." Frontiers in Psychology, vol. 13, Feb. 2022, doi:10.3389/fpsyg. 2022.836393.

[10] Palos Lucio, Ana Gabriela, et al. "Nutritional Quality of Fast Food Kids Meals and Their Contribution to the Diets of School-Aged Children." Nutrients, vol. 12, no. 3, Feb. 2020, p. 612, doi:10.3390/nu12030612.

[11] Payab, Moloud, et al. "Association of Junk Food Consumption with High Blood Pressure and Obesity in Iranian Children and Adolescents: The CASPIAN-IV Study." Jornal de Pediatria, vol. 91, no. 2, Mar. 2015, pp. 196–205, doi: 10.1016/j.jped.2014.07.006.

[12] S, Ankul Singh, et al. Since January 2020 Elsevier Has Created a COVID-19 Resource Centre with Free Information in English and Mandarin on the Novel Coronavirus COVID- 19. The COVID-19 Resource Centre Is Hosted on Elsevier Connect , the Company ' s Public News and Information . no. January, 2020.

[13] Saba Tariq, et al. "Relationship of BMI with Junk Food, Sleep Pattern, Exam Performance and Awareness about Its Ill Health Effects in Healthy Teenagers." Journal of the Pakistan Medical Association, Oct. 2020, pp. 1–16, doi:10. 47391/JPMA.507.

[14] Seema, S., et al. "Prevalence and Contributing Factors for Adolescent Obesity in Present Era: Cross-Sectional Study." Journal of Family Medicine and Primary Care, vol. 10, no. 5, May 2021, pp. 1890–94, doi:10.4103/jfmpc.jfmpc_ 1524_20.

[15] Shree, Vijay, et al. "Study on Consumption of Fast Food among Medical Students of IGIMS, Patna." International Journal Of Community Medicine And Public Health, vol. 5, no. 7, June 2018, p. 2750, doi:10.18203/2394-6040. ijcmph20182416.

[16] Subhalakshmi, K., and M. Dhanasekar. "A Study on Fast Food Culture among Teenagers in Urban India." International Journal of Pure and Applied Mathematics, vol. 120, no. 5, 2018, pp. 215–38, http://www.acadpubl.eu/hub/.

[17] Thomas, UshaM, et al. "Prevalence of Overweight and Obesity among School Children in Mysuru, Karnataka." Journal of Family Medicine and Primary Care, vol. 10, no. 8, 2021, p. 2788, doi:10.4103/jfmpc.jfmpc_2334_20.

[18] Vishal, Rajani, et al. "Rising Fast Food Consumption Among Adolescent Girls in Urban Area: Call for Concern." International Journal of Scientific Research, no. August, 2022, pp. 62–64, doi:10.36106/ijsr/4122294.