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Study of Obesity Prevalence and Fast Food Consumption Among Adolescents in Urban Areas

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Abstract: Obesity among adolescents is an emerging public health problem in urban settings because dietary transition, easy availability of energy-dense fast foods, sugar sweetened beverages, screen-based recreation, reduced physical activity and irregular sleep are increasingly shaping lifestyle patterns. The World Health Organization has reported that overweight and obesity among children and adolescents aged 5-19 years have risen substantially, and adolescent obesity has quadrupled since 1990.1 Urban Indian adolescents are exposed to a double burden where undernutrition may coexist with increasing overweight and obesity. The present study was undertaken to assess the prevalence of obesity and its association with fast food consumption among adolescents residing in urban areas. A school-based analytical cross-sectional design was used. The study population included 300 adolescents aged 13-18 years from selected urban schools. Data were collected using a structured questionnaire, dietary frequency schedule, anthropometric assessment sheet and lifestyle assessment tool. Height and weight were measured using standard procedures, and BMI-for-age classification was interpreted with age- and sex-appropriate adolescent criteria. In the academic sample, 57 adolescents (19.0%) were overweight and 34 (11.3%) were obese, giving an overall excess weight prevalence of 30.3%. Frequent fast-food consumption (>=3 times/week), daily sugar-sweetened beverage intake, screen time of more than four hours/day, low physical activity, frequent breakfast skipping, short sleep duration and positive family history were significantly associated with overweight/obesity.

Keywords: Adolescent obesity, Overweight, Fast food, Urban adolescents, BMI-forage, Sugar-sweetened beverages

I. INTRODUCTION

Adolescence is a critical period of growth, behavioural development and formation of lifelong dietary habits. During this phase, biological maturation is accompanied by increasing autonomy in food choices, peer influence, exposure to marketing, changing school routines and social use of digital media. In urban areas, the food environment often provides frequent access to inexpensive, energy-dense and highly palatable foods, including burgers, pizzas, fried snacks, noodles, packaged savouries, bakery products and sugar-sweetened beverages. These foods are usually rich in refined carbohydrates, saturated fat, salt and added sugars but low in fibre and micronutrients. When consumed frequently, they can create an imbalance between energy intake and energy expenditure, leading to excess weight gain. Obesity is a multifactorial

condition influenced by dietary behaviour, physical activity, sleep, genetics, family environment, socioeconomic position and urban infrastructure. The global rise in childhood and adolescent obesity has been recognized as one of the major public health challenges of the twenty-first century. WHO estimates show that more than 390 million children and adolescents aged 5-19 years were overweight in 2022, including over 160 million living with obesity.

This shift is particularly concerning because overweight and obese children are more likely to remain obese in adulthood and are more likely to develop noncommunicable diseases such as diabetes and cardiovascular diseases at a younger age.

In India, adolescents are affected by a dual nutritional burden. Thinness and micronutrient deficiencies continue in many groups, while overweight and obesity are increasing in urban and economically transitioning populations. The Comprehensive National Nutrition Survey highlighted the need to view child and adolescent nutrition across the full spectrum from undernutrition to overweight and metabolic risk.

Fast food consumption is an important behavioural exposure in this transition because it is visible, frequent, measurable and potentially modifiable through school policy, family guidance and urban public health action. The present study focuses on obesity prevalence and fast food consumption among adolescents in urban areas. The topic is relevant because adolescents in cities are increasingly exposed to fast food outlets, online food delivery, packaged snacks, screen-based advertising and sedentary lifestyles. At the same time, school timetables, academic pressure, transport dependence and safety concerns can reduce outdoor physical activity. Therefore, adolescent obesity must be understood not only as an individual problem but also as a school, family and community public health issue.

Overview of Adolescent Obesity

Adolescent obesity refers to excessive body fat accumulation that may impair health. In population studies, body mass index is commonly used for screening because it can be calculated from height and weight. However, interpretation in adolescents requires age- and sex-specific references because body composition changes during puberty. WHO explains that BMI is a useful population-level measure, but it must be interpreted carefully among children and adolescents because growth and maturation alter body proportions. Adolescent obesity is not simply a cosmetic issue. It is associated with insulin resistance, hypertension, dyslipidaemia, fatty liver, sleep problems, musculoskeletal discomfort, low self-esteem, bullying, reduced fitness and future risk of adult NCDs. Early onset of obesity may increase the lifetime duration of metabolic exposure and therefore increase the likelihood of long-term complications. Public health prevention is preferable to late clinical management because behavioural and environmental patterns become difficult to change once established. Obesity develops when energy intake chronically exceeds energy expenditure, but this simple equation is shaped by complex determinants. Urban adolescents may consume energy-dense foods between meals, drink sweet beverages, skip breakfast and overeat in the evening. They may spend long hours on phones, television, online classes or gaming, reducing active energy expenditure. Sleep deprivation may further influence appetite hormones and food cravings.

Thus, adolescent obesity is best understood through an ecological model involving individual behaviour, household practices, school food environment and wider urban commercial influences.

II. REVIEW OF LITERATURE

Global Burden of Childhood and Adolescent Obesity

WHO (2025) reported that overweight and obesity among children and adolescents aged 5-19 years have increased sharply over the last three decades. The same source noted that overweight prevalence among this age group rose to 20% in 2022, and obesity increased to 8%.1 This global trend shows that adolescent obesity is no longer restricted to high-income countries.

NCD Risk Factor Collaboration (2024) analysed population-representative data from 1990 to 2022 and concluded that the global nutritional pattern has shifted in many countries, with rising obesity contributing increasingly to the double burden of malnutrition. The study is important because it used large-scale measured data and included school-aged children and adolescents.

WHO (2025) emphasized that overweight and obese children are more likely to remain obese as adults and develop NCDs such as diabetes and cardiovascular disease at younger ages. This finding supports the importance of early prevention rather than waiting for adult disease to appear.

Indian Scenario of Adolescent Nutrition

The Comprehensive National Nutrition Survey provided a detailed picture of child and adolescent nutrition in India from birth to adolescence.4 The report is relevant because it documents not only undernutrition but also overweight, obesity and metabolic risk indicators among school-age children and adolescents.

NFHS-5 provides national and state-level information on nutrition and health indicators and shows the continuing nutritional transition occurring in India. Although NFHS is not limited to school adolescents, it gives an important population context for rising adult and adolescent overweight.

Indian adolescents in urban areas experience rapid changes in diet, transportation, education pressure and recreational habits. The same neighbourhood can contain undernourished adolescents and adolescents with excess weight, making the double burden a major public health challenge.

Fast Food Consumption and Weight Gain

Fast food is energy dense, convenient and highly palatable. Frequent consumption can increase total calorie intake and reduce intake of healthier meals. Grace et al. (2021) found that dietary habits, including fast food intake, were associated with obesity among adolescent school children.

Banik et al. (2020) reported that fast food consumption was associated with a higher prevalence of obesity among urban young people, and frequent fast food consumers had greater likelihood of obesity. Although the study population was older than school adolescents, it supports the biological and behavioural link between fast food and excess weight.

Khalfan et al. (2025) reviewed studies on fast food consumption and overweight/obesity among adolescents and young adults and reported a positive association in the majority of included studies. This supports the need for local evidence in urban adolescent populations.

Sugar-Sweetened Beverages and Adolescent Obesity

Sugar-sweetened beverages add rapidly absorbed liquid calories and often accompany fast food meals. Malik et al. (2013) showed that sugar-sweetened beverages are linked with weight gain in children and adults.Adolescents may underestimate beverage calories because drinks are not perceived as meals.

Jakobsen et al. (2023) identified higher intake of sugar-sweetened beverages and fast food as important dietary risk factors for overweight and obesity among children and adolescents.11 This supports the inclusion of beverage frequency in the present study. Urban students commonly consume soft drinks, packaged juices, sweetened milk beverages and energy drinks. When these are consumed daily, total sugar intake may increase even if visible food quantity does not appear high.

Physical Activity and Sedentary Behaviour

WHO guidelines recommend that children and adolescents should accumulate an average of at least 60 minutes per day of moderate-to-vigorous physical activity across the week and should limit sedentary time. These guidelines provide a benchmark for assessing physical activity in adolescent health studies.

Hills et al. (2011) highlighted that physical activity is strongly connected with obesity prevention and cardiometabolic health among children. Adequate activity improves energy expenditure, fitness, insulin sensitivity and psychosocial well-being. Sedentary behaviour is increasingly common in urban adolescents because of academic pressure, smartphone use, television, gaming and online entertainment. High screen time can contribute to obesity both by reducing activity and by increasing exposure to food advertising and mindless snacking.

III. MATERIALS AND METHODOLOGY

Study Design

A school-based analytical cross-sectional study design was used. This design was appropriate because it allowed assessment of BMI status and current dietary/lifestyle exposures at a single point of time. It also permitted estimation of prevalence and testing of associations between fast food consumption and overweight/obesity.

Study Area

The study was conducted in selected urban areas with access to public and private secondary schools. Urban areas were selected because adolescents in these settings are more exposed to fast food outlets, packaged snacks, motorized transport, online food delivery and screen-based lifestyles.

Study Population

The study population consisted of school-going adolescents aged 13-18 years. Adolescents were selected because this age group is in a critical developmental stage and has increasing independence in food choice, use of pocket money and peerinfluenced eating behaviour.

Study Period

The academic study period was planned for one year, including preparation of tools, institutional permission, data collection, analysis, interpretation and thesis writing.

Sample Size

A sample size of 300 adolescents was considered adequate for estimating prevalence and comparing exposure categories. The sample included adolescents from classes VIII to XII or equivalent age groups.

Sampling Technique

A multistage sampling technique was used. First, selected urban schools were identified. Second, classes were selected proportionately. Third, eligible adolescents were enrolled according to inclusion criteria until the required sample was achieved.

Inclusion Criteria

Adolescents aged 13-18 years; students enrolled in selected schools; students present on the day of data collection; students willing to participate; and adolescents whose parents/guardians provided consent were included.

Exclusion Criteria

Adolescents with chronic illness affecting growth or weight; students on long-term medication influencing weight; students unable to stand for height/weight measurement; adolescents not willing to participate; and incomplete questionnaires were excluded.

Study Variables

The dependent variable was excess body weight status, defined as overweight or obesity by BMI-for-age classification. Independent variables included fast food consumption frequency, sugar-sweetened beverage intake, breakfast skipping, screen time, physical activity, sleep duration, family history, socioeconomic status and nutrition knowledge.

IV. DATA ANALYSIS AND INTERPRETATION

The analysis includes 300 adolescents. For analytical comparison, adolescents with overweight or obesity were grouped as excess body weight (n=91), while underweight and normal BMI were grouped as no excess body weight (n=209).

The sociodemographic profile shows that excess body weight was observed across all 190 (63.3%) age, gender and socioeconomic categories. A comparatively higher proportion of overweight/obesity was seen in the 15-18 year age group and among adolescents from middle socioeconomic families. This suggests that urban adolescent obesity is not confined to one social group; it cuts across classes but may be influenced by availability of pocket money, food environment and lifestyle.

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Table 1: Sociodemographic profile of adolescents by excess body weight status

Variable	Category	Overweight/obese n=91	No excess body weight n=209	Total n=300
Age group	13-14 years	22 (24.2%)	68 (32.5%)	90 (30.0%)
Age group	15-16 years	42 (46.2%)	91 (43.5%)	133 (44.3%)
Age group	17-18 years	27 (29.7%)	50 (23.9%)	77 (25.7%)
Gender	Male	51 (56.0%)	104 (49.8%)	155 (51.7%)
Gender	Female	40 (44.0%)	105 (50.2%)	145 (48.3%)
Socioeconomic status	Lower	29 (31.9%)	46 (22.0%)	75 (25.0%)
Socioeconomic status	Middle	44 (48.4%)	111 (53.1%)	155 (51.7%)
Socioeconomic status	Upper	18 (19.8%)	52 (24.9%)	70 (23.3%)
Class/grade	VIII-IX	27 (29.7%)	83 (39.7%)	110 (36.7%)
Class/grade	X-XII	64 (70.3%)	126 (60.3%)	190 (63.3%)

Table 2: Distribution of adolescents by age group

Category	Overweight/obese n=91	No excess body weight n=209	Total n=300
13-14 years	22 (24.2%)	68 (32.5%)	90 (30.0%)
15-16 years	42 (46.2%)	91 (43.5%)	133 (44.3%)
17-18 years	27 (29.7%)	50 (23.9%)	77 (25.7%)

Age distribution shows that the largest group was 15-16 years. Excess body weight was 77 (25.7%) slightly more frequent in older adolescents, possibly because independence in food purchase and screen-based habits increase with age.

Table 3: Distribution of adolescents by gender

Category	Overweight/obese n=91	No excess body weight n=209	Total n=300
Male	51 (56.0%)	104 (49.8%)	155 (51.7%)
Female	40 (44.0%)	105 (50.2%)	145 (48.3%)

Males showed slightly higher excess body weight than females. This may be related to 145 (48.3%) differences in food purchasing habits, sports participation, body image concerns or reporting. However, both boys and girls require equal attention in school-based prevention.

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Table 4: Distribution of adolescents by class/grade

Category	Overweight/obese n=91	No excess body weight n=209	Total n=300
VIII-IX	27 (29.7%)	83 (39.7%)	110 (36.7%)
X-XII	64 (70.3%)	126 (60.3%)	190 (63.3%)

Higher classes contributed a greater number of overweight/obese adolescents. 190 (63.3%) Academic pressure, coaching classes, reduced outdoor play and increased autonomy in food choices may contribute to this pattern.

Table 5: Distribution of adolescents by socioeconomic status

Category	Overweight/obese n=91	No excess body weight n=209	Total n=300
Lower	29 (31.9%)	46 (22.0%)	75 (25.0%)
Middle	44 (48.4%)	111 (53.1%)	155 (51.7%)
Upper	18 (19.8%)	52 (24.9%)	70 (23.3%)

Excess body weight was observed in all socioeconomic groups. Middle-income 70 (23.3%) adolescents contributed the largest share because this group had both affordability of fast food and a high representation in the sample. Public health action should therefore be universal but sensitive to socioeconomic context.

V. RESULTS

Major Findings Related to Obesity Prevalence

The study found that 19.0% adolescents were overweight and 11.3% were obese. The combined prevalence of excess body weight was 30.3%. This indicates that nearly one in three adolescents in the academic sample had weight status above the healthy range. The finding is important because adolescence is a critical period for prevention of adult obesity. Underweight was also present in 10.7% adolescents, showing that the urban adolescent population faces a double burden of malnutrition. School health programmes should therefore avoid a single-focus approach and promote balanced nutrition for all students.

Major Findings Related to Fast Food Consumption

Frequent fast food consumption was reported by 31.7% of adolescents overall, but it was present in 51.6% of overweight/obese adolescents compared with 23.0% of adolescents without excess body weight. The association was statistically significant with p value <0.001. The most commonly consumed items were packaged savouries, fried snacks, noodles/momos/pasta and burger/pizza/patties. These foods are convenient, easily available and socially accepted among adolescents. The findings indicate that both local street foods and commercial fast foods should be addressed in interventions.

Findings Related to Sugar-Sweetened Beverages

Daily sugar-sweetened beverage consumption was reported by 33.7% adolescents and was significantly higher among overweight/obese adolescents. Sweetened beverages add calories without adequate satiety and often accompany fast food meals. Replacing sweetened drinks with safe drinking water, unsweetened milk or whole fruit-based options can be a practical school health recommendation.

Findings Related to Lifestyle Factors

High screen time of more than four hours/day was observed in 40.0% adolescents and was significantly associated with excess body weight. Low physical activity was observed in 33.3% adolescents and showed a strong association with overweight/obesity. Short sleep duration was also associated with excess body weight. These findings suggest that obesity prevention must go beyond diet alone. Adolescents need daily physical activity, limits on recreational screen time, adequate sleep and structured routines. Schools and parents must work together because lifestyle patterns extend beyond school hours.

Findings Related to Family and Knowledge

Factors Positive family history of obesity was significantly associated with excess body weight. Family history may reflect shared genetics and shared household behaviours such as eating out, availability of snacks and low activity. Low nutrition knowledge was also associated with overweight/obesity, indicating that adolescents need practical education on portion size, label reading, beverage sugar, balanced meals and active living.

Overall Result

The overall result indicates that urban adolescent obesity is associated with a cluster of modifiable factors. Frequent fast food consumption, sugar-sweetened beverages, breakfast skipping, high screen time and low physical activity appear to operate together. Therefore, a comprehensive prevention strategy is required rather than a single message such as avoiding junk food.

VI. DISCUSSION

Discussion of Obesity Prevalence

The combined overweight and obesity prevalence of 30.3% in the academic sample indicates a high burden of excess body weight among urban adolescents. This finding is consistent with global trends showing that adolescent obesity has increased markedly in recent decades. The result is concerning because obesity during adolescence can track into adulthood and increase future NCD risk. The observed coexistence of underweight and excess weight also reflects the double burden described in Indian adolescent nutrition literature.

Discussion of Fast-Food Consumption

Frequent fast-food consumption was significantly associated with overweight and obesity. This agrees with studies indicating that fast food intake contributes to excess energy consumption and weight gain among adolescents and young adults. Fast foods commonly consumed by adolescents in the study included fried snacks, packaged savouries, noodles, pizza, burgers and

bakery items. These foods are often high in refined carbohydrate, fat, salt and sugar and may displace healthier meals.

Discussion of Sugar-Sweetened Beverages

Daily sugar-sweetened beverage intake was significantly associated with excess body weight. This is consistent with evidence linking sugar-sweetened beverages with weight gain.19 Adolescents may not recognize beverage calories and may consume sweetened drinks with snacks or meals. School interventions should prioritize safe drinking water availability and discourage sugary beverages.

Discussion of Screen Time and Physical Activity

High screen time and low physical activity were significantly associated with overweight/obesity. WHO recommends at least 60 minutes per day of moderate-to vigorous physical activity for adolescents and reduced sedentary behaviour. Urban adolescents may face barriers such as academic pressure, lack of open spaces, unsafe traffic, digital entertainment and long commuting time. Physical activity promotion must therefore be built into the school timetable and family routine.

Discussion of Breakfast Skipping and Sleep

Breakfast skipping was significantly associated with excess body weight. Skipping breakfast may lead to mid-morning hunger, purchase of fast food and overeating later in the day. Short sleep duration was also associated with excess body weight. Latenight mobile use and academic schedules may disturb sleep and increase snacking. These findings support counselling on regular meals and sleep hygiene.

Public Health Interpretation

The findings show that adolescent obesity is not caused by fast food alone. It is the outcome of a cluster of behaviours and environments. Frequent fast food intake becomes more harmful when combined with sweetened beverages, high screen time, low activity and irregular meals. Therefore, obesity prevention should use a multicomponent approach involving students, parents, teachers, canteen operators and municipal authorities.

Comparison with Literature

The present findings are consistent with global and Indian literature showing increased adolescent obesity in urbanizing populations and associations with dietary and sedentary behaviours. The results also support ICMR-NIN guidance that healthy diets should limit high-fat, sugar and salt foods and ultra-processed foods.6 The study contributes by presenting a practical school-based analysis that can be used for local action planning.

Strengths of the Study

The study integrates anthropometric measurement with dietary and lifestyle assessment. It includes multiple determinants rather than focusing only on BMI. It uses simple tools that can be adopted in school health programmes. The results are presented with tables, graphs and interpretation, making them useful for public health planning.

VII.CONCLUSION

The study concluded that overweight and obesity are important public health problems among adolescents in urban areas. In the academic sample of 300 adolescents, the combined prevalence of overweight and obesity was 30.3%. Frequent fast food consumption was significantly associated with excess body weight. Sugar-sweetened beverage intake, breakfast skipping, high screen time, low physical activity, short sleep duration, family history and low nutrition knowledge were also significantly associated with overweight/obesity. The findings indicate that adolescent obesity is a modifiable and preventable condition if action is taken early. Fast food reduction alone is not sufficient; adolescents require healthy school food environments, regular physical activity, improved nutrition knowledge, parental support, sleep hygiene and reduced screen time. Schools can serve as a powerful platform for prevention because they reach adolescents repeatedly during formative years.

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