

Association Between Fast Food Consumption and Overweight Status Among Adolescents

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ABSTRACT

Introduction: Adolescent obesity is a growing national and international public health concern. The rising incidence of overweight in school-age children is believed to be caused by dietary shifts toward fast food, which is heavy in energy, fat, and sugar. Teenagers are more likely to eat fast food because of factors such as availability, convenience, and the influence of media and social surroundings. Such eating patterns may eventually increase the risk of obesity and non-communicable diseases by causing an energy imbalance. As a result, it's critical to determine the relationship between the prevalence of overweight among teenagers and fast-food intake. The purpose of this study was to investigate the association between junior high school students' fast-food consumption and overweight status. However, there is still little data on this connection among teenagers in Indonesia.

Methods: A sample of 130 junior high school pupils was chosen using proportionate stratified random sampling in this cross-sectional study. Questionnaires were used to collect data on fast food consumption, and Body Mass Index for Age (BMI-for-age) was calculated using height and weight measurements to assess nutritional health. The Chi-Square test and odds ratios (ORs) with 95% confidence intervals (CIs) were used for data analysis.

Results: The prevalence of overweight in this study was 20.0%. The analysis found a strong correlation between fast-food consumption and overweight status ($p=0.004$). Adolescents who consumed more fast food were more likely to be overweight than those who consumed less (OR = 3.43; 95% CI: 1.44–8.19).

Conclusion: High fast-food intake was significantly associated with higher odds of being overweight among junior high school students. May be considered while creating strategies to combat obesity. Strategies for managing teenage obesity could include reducing fast-food consumption.

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INTRODUCTION

Overweight adolescents are now a major national and international public health concern. Over the past few decades, there has been a notable increase in the prevalence of overweight and obesity among children and adolescents worldwide. The prevalence of overweight was 7.3% in 2013 and rose by 2.2 percentage points to 9.5% in 2018, according to Riskesdas data. Teenagers who are overweight may have major issues like low self-esteem and potential discrimination from the community. Additionally, degenerative disorders like type 2 diabetes mellitus, coronary heart disease, stroke, and several types of cancer can be brought on by being overweight (1).

A hectic schedule that allows little opportunity for physical activity to burn off stored energy might lead to adolescent obesity. Teenagers are more likely to become overweight because they typically avoid eating breakfast, eat fast food, and lead sedentary lifestyles (2). Teenagers who often skip breakfast, eat fast food, don't eat enough fruits and vegetables, don't get enough exercise, and favor sedentary hobbies are more likely to be overweight or obese. Nutritional problems are common among adolescents during this critical time. Due to their rapid physical growth, increased muscle and fat mass, hormonal changes, and high levels of physical activity, adolescents have higher nutritional needs than adults. To avoid an energy imbalance that could lead to nutritional issues, it is crucial to monitor the relationship between energy intake and expenditure, including physical activity (3).

On present trends, by 2060, the large majority of countries are projected to experience overweight and obesity, with prevalence levels above 70% of the entire population, including children (4). Excessive fat accumulation in the body is the hallmark of obesity, a disorder that raises health risks. The percentage of teenagers who are overweight is 70%, and 70% of adults are overweight, while only about 8% of teenagers with normal body weight go on to become overweight (5).

Over 340 million children and adolescents between the ages of 5 and 19 were overweight or obese in 2016, and 39 million children under the age of five were overweight or obese in 2020, according to a 2020 WHO report. Adolescents who struggle with nutrition need special care because these difficulties have an impact on their physical development and can damage them as adults (6,7).

10.8% of children aged 5 to 12 are overweight, and 9.2% are obese, according to SSGI 2022 estimates. This means that 1 in 5 children—or 64.4% of the total—are overweight as a result of inactivity. Up to 16% of kids between the ages of 13 and 15 are overweight, and 13.5% and 49.6% of kids between the ages of 16 and 18 are obese and overweight as a result of inactivity, respectively (8). Despite this, there remains a dearth of empirical data, particularly in school-based settings, on the association between fast-food intake and overweight among junior high school adolescents.

Overeating has been linked to overweight in teenagers, according to earlier studies. According to the findings, 16.6% of children have a practice of eating less yet are fat, while 17.6% of children have a habit of overeating but are not obese. Individual variations in metabolic pathways could be the cause of this discrepancy. overweight. Generally speaking, being overweight is a condition that arises over time as a result of an imbalance between energy expenditure and consumption. Overweight develops over time as a result of an imbalance between energy expended and energy consumed (9).

Additionally, prior research indicates that psychological factors, such as stress, may affect eating habits. According to an American Psychological Association poll, 39% of adults overeat when under stress. The hypothalamus releases corticotropin-releasing factor (CRF) in response to stress. The pituitary gland subsequently secretes adrenocorticotrophic hormone, which instructs the adrenal glands to release cortisol and raise cortisol levels. Stress-related hormonal responses, including CRF, cortisol, leptin, insulin, and neuropeptide Y (NPY), may physiologically modulate appetite control and increase food intake (10,11).

Initial observations at a junior high school in Gedung Johor, Medan, showed that the majority of the snacks sold there are fast-food products such as meatballs, grilled sausages, fried instant noodles, and sweetened drinks. Additionally, student interviews revealed that they frequently ate high-energy foods before class.

Therefore, this study aims to examine the association between fast food consumption and overweight status among junior high school adolescents.

However, while previous research has emphasized the importance of psychological variables and overeating in overweight, little attention has been paid to specific dietary patterns, such as fast-food consumption among

teenagers, especially in local school-based contexts. Therefore, further research is needed to fully understand the relationship between fast-food consumption and overweight status in this demographic.

METHOD

Study Design

This study utilized an analytical observational design with a cross-sectional approach (12). To investigate the association between fast-food intake and overweight status among teenagers at a single point in time, a cross-sectional design was used. Without altering or interacting with the study population, this strategy enabled researchers to find correlations between variables.

Study Setting and Period

This research was conducted in junior high schools in the working area of Gedung Johor Village, Medan Johor Subdistrict, Medan City, with the implementation period from December 2025 to February 2026.

Participants and Sampling

The population in this study consisted of all junior high school students (male and female) from two junior high schools in Gedung Johor Subdistrict, totaling 350 students.

The sample size was determined using the Lemeshow formula for testing two proportions with a 95% confidence level and 80% power. After applying the finite population correction, the minimum sample requirement was 115 respondents. To strengthen the analysis and account for potentially incomplete data, the sample size was set at 130 respondents.

Respondents were distributed proportionately within each school using proportionate stratified random sampling. Based on the list of qualified students, respondents were chosen by simple random selection within each stratum.

The inclusion criteria were: (1) students aged 12–15 years, (2) enrolled as active students during the study period, and (3) willing to participate with parental/guardian consent. The exclusion criteria were: (1) students with incomplete questionnaire data, (2) students who were absent during data collection, and (3) students with medical conditions affecting body weight measurement.

Data Collection Procedures

The researchers acquired ethical approval from the relevant research ethics committee and official permission from the school before beginning data collection. The researchers informed the respondents and their parents/guardians of the study's goals, benefits, and methods before the study began. Respondents who agreed to participate in the research were asked to fill out an informed consent form.

Data were collected in two stages, namely questionnaire completion and anthropometric measurements. The questionnaires were completed directly in the classroom with the assistance of researchers and trained enumerators to ensure that the instructions were well understood. A food frequency questionnaire (FFQ) was used to measure the frequency of food consumption. The SQ-FFQ form is used to assess an individual's dietary habits over the past month. Prior to the main study, the questionnaire was tested for validity and reliability among 30 junior high school students in Kelurahan Titi Kuning, Medan, who had characteristics similar to the study population but were not included in the final sample. With item-total correlation coefficients higher than the essential value ($r > 0.361$), every questionnaire item was determined to be valid. Good internal consistency was indicated by the reliability analysis's Cronbach's alpha coefficient of 0.82. These findings indicate that the FFQ was valid and reliable for assessing fast food consumption among adolescents in this study. Adolescents' fast-food consumption was categorized as "high" or "low" based on weekly frequency, using predefined cut-off points derived from FFQ responses. This categorization approach has been commonly used in similar epidemiological studies to differentiate relative consumption levels among adolescents. Body Mass Index (BMI) was calculated as weight in kilograms divided by height in meters squared (kg/m^2). Nutritional status was determined using BMI-for-age based on the World Health Organization (WHO) growth reference for children and adolescents aged 5–19 years (13).

Data Analysis

The data were collected in advance through editing, coding, and entry into statistical software to ensure completeness and consistency. The analysis was conducted in stages, including univariate, bivariate,

Univariate analysis was used to describe the characteristics of respondents, fast food consumption patterns, and the distribution of overweight status. Categorical data were presented in the form of frequency distributions and percentages, while numerical data were presented in the form of means and standard deviations.

The Chi-Square test was used in bivariate analysis to examine the association between eating fast food and being overweight. The strength of the relationship was expressed as the odds ratio (OR) with a 95% confidence interval (95% CI). A p -value < 0.05 was set as the statistical significance threshold.

Even so, bivariate analysis was used to evaluate the relationship between fast-food consumption and being overweight. Potential confounding factors were not considered in the analysis due to the study's limited number of variables.

Ethical Approval

The Health Research Ethics Commission of Sari Mutiara Indonesia University granted ethical permission for this study (No.3983/F/KEP/USM/XI/2025). Before data collection, the study's goals and methods were thoroughly explained to each participant. Before taking part in the study, each subject provided written informed consent. There was no intervention because this study used a cross-sectional observational approach. Throughout the study, participants' anonymity and confidentiality were guaranteed.

RESULTS

This section displays the data analysis results from 130 junior high school students. The study was conducted in stages, employing multivariate analysis to identify factors independently associated with being overweight, bivariate analysis to examine the relationship between fast-food intake and being overweight, and univariate analysis to describe the respondents.

The study includes 130 secondary school students, consisting of male and female adolescents.

Table 1. Distribution of Respondent Characteristics (n=130)

Number	Respondent Characteristic	Category	Amount	Percent %
1	Sex	Female	64	49,2
		Male	66	50,8
2	Fast Food Consumption	High	56	43,1
		Low	74	56,9
3	Nutritional Status	Overweight	26	20,0
		Non-overweight	104	80,0

Based on Table 1, the distribution of respondents by sex was relatively balanced, with a slightly higher proportion of males (50.8%) than females (49.2%). More than half of the respondents (56.9%) reported low fast food consumption, while 43.1% were categorized as having high consumption. The prevalence of overweight among respondents was 20.0%.

Table 2. Relationship Between Overweight and Fast Food Consumption

Fast Food Consumption	Overweight n (%)	Non-overweight n (%)	OR (95% CI)	p-value
High (n = 56)	18 (32.1%)	38 (67.9%)	3.43 (1.44–8.19)	0.004
Low (n = 74)	8 (10.8%)	66 (89.2%)	1	

Based on Table 2, Fast food consumption and being overweight were found to be statistically significantly correlated ($p=0.004$) by the Chi-square test. Teens who consumed a lot of fast food were more likely to be overweight than those who didn't ($OR = 3.43$; 95% CI: 1.44–8.19).

DISCUSSION

This study shows that the prevalence of overweight among secondary school students is 20.0%. This figure indicates that one in five adolescents is overweight, which is a risk factor for a number of adult non-communicable illnesses.

This finding reflects a substantial burden of adolescent overweight and is consistent with increasing trends reported in developing countries, including Indonesia (14).

Fast food intake and being overweight are significantly correlated, according to bivariate analysis results ($p=0.004$). Teenagers who consumed a lot of fast food were more likely to be overweight than those who did not ($OR=3.43$; 95% CI: 1.44–8.19).

These results imply that frequent fast food intake is linked to teenage obesity. Fast food's high energy density, fat content, and sugar content may boost energy intake without a corresponding increase in satiety, which could result in a positive energy balance from a physiological standpoint (15,16).

Over time, this disease may lead to a rise in body mass index and the buildup of fatty tissue. Additionally, eating fast food is frequently followed by drinking more sugary beverages, which raises overall energy intake without satisfying hunger. The results of this study are in line with numerous international investigations. According to Miheret Mandefro et al., long-term longitudinal research has linked frequent fast food consumption to weight gain and insulin resistance (17).

Numerous factors, such as diet, exercise, and fruit and vegetable consumption, might contribute to adolescent overweight. As a result, the association found in this study should be understood in light of several factors among Indonesian teenagers, including eating patterns, daily fiber consumption, and the timing of fruit consumption. In addition to eating low-fiber foods and skipping breakfast, most kids are more inclined to eat foods high in calories, fat, sugar, and salt (18). Theoretically, external factors such as diet and physical activity have a major impact on overweight, general obesity, and central obesity. The risk of central and general obesity increases with insufficient daily intake of fruits and vegetables. Adolescents who are overweight in comparison to those who consume enough fruits and vegetables each day (19,20).

The nutritional factors of obesity must be addressed at the school, family, and community levels because teenage obesity is increasing alarmingly both internationally and in many contexts. Children's health education is offered by school health services. To prevent the early onset of noncommunicable diseases, parents can play a significant role by raising awareness of the importance of a balanced diet, limiting consumption of high-energy foods, and ensuring their kids get enough fruits and vegetables (21,22).

Compared to people who are not obese, those who are obese have larger levels of body fat. The majority of fat-soluble vitamins are kept in body fat. Higher levels of body fat may be associated with lower blood levels of fat-soluble vitamins. Obesity and increased body weight have been linked to diets heavy in animal fat. People who are overweight are more likely to eat diets high in whole grains and fiber (23,24).

One significant aspect linked to teenage obesity is dietary practices. Most adolescents (75.2%) have breakfast, but a lesser percentage (24.8%) do not. These patterns may reflect variations in daily dietary behavior that could influence overall energy balance and overweight.

Adolescence is a time of growing food choice autonomy from the standpoint of health behavior. Adolescent consumption patterns may be influenced by peer pressure, media exposure, food industry advertising, and the presence of fast-food restaurants near schools. Being overweight may be more likely in an obesogenic atmosphere that makes it easier to obtain high-calorie, low-nutrient foods. Thus, it is important to consider broader environmental and social factors when interpreting the relationship established in this study (25,26).

It should be mentioned that a cross-sectional design cannot verify causation, even though this study found a substantial correlation. Other factors not included in this study, such as physical activity patterns, screen time, or breakfast routines, may affect the findings. Nonetheless, the association appears statistically significant, as the observed odds ratio and confidence interval do not include unity (27).

The practical implications of these findings highlight the importance of preventive and promotional measures to reduce teenage fast-food consumption. Increasing the availability of healthy food alternatives, enhancing nutrition instruction in schools, and working with parents to foster more balanced eating habits at home are all strategies that can be implemented. These initiatives could support initiatives to treat obesity and associated long-term health effects, such as adult non-communicable diseases (28).

Overall, this study shows that among junior high school students, eating fast food is strongly associated with overweight status. Managing fast-food consumption patterns may be considered part of broader strategies to address overweight among adolescents at the school and community levels. Controlling fast food consumption patterns needs to be an integral part of adolescent obesity prevention strategies at the school and community levels

Interpretation of Key Findings

According to this study, Students in secondary schools who consume large amounts of fast food are more likely to gain weight. Teenagers who consume a lot of fast food are 3.43 times more likely to be overweight than those who don't, demonstrating that fast food is a substantial epidemiological risk factor.

Fast food's high calorie, fat, and sugar content causes an energy surplus and the buildup of body fat. Although a causal association cannot be confirmed using a cross-sectional design, these findings highlight the need to limit fast-food intake as part of a plan to reduce overweight among adolescents.

Limitations and Cautions

This study has many drawbacks. First, because exposure and result are evaluated simultaneously, the cross-sectional design makes it impossible to determine causal links (29). Second, self-report measures were used to collect data on fast food intake, which may have introduced information biases, such as social desirability and recall biases (30). Thirdly, additional confounding variables that may affect teenagers' body weight status, such as physical activity and total caloric intake, were not taken into account in this study (31).

Recommendations for Future Research

Future research should use cohort or longitudinal designs to evaluate the causal relationship between fast food consumption and teenage obesity. To get a more complete risk estimate, future research should also evaluate confounding variables, including screen time, physical activity, and overall energy intake. To improve the generalizability of results and assist in the development of policies to prevent adolescent obesity, research with broader population coverage and a school-based methodology is also required.

CONCLUSION

High consumption of fast food is strongly associated with a higher incidence of obesity among secondary school pupils. Adolescents who consume fast food frequently are more than three times more likely to be overweight than those who consume it infrequently. These findings confirm that controlling fast food consumption is an important component of strategies to prevent overweight among school-aged adolescents.

AUTHOR'S CONTRIBUTION STATEMENT

All authors contributed to the data analysis, drafting, and revision of the article and agreed to be responsible for all aspects of this work.

CONFLICTS OF INTEREST

The authors have declared that no competing interests exist.

DECLARATION OF GENERATIVE AI AND AI-ASSISTED TECHNOLOGIES IN THE WRITING PROCESS

The authors acknowledge the use of AI-assisted language-editing software (Grammarly) solely for grammar correction and to enhance linguistic clarity. All aspects of the study design, data collection, statistical analysis, interpretation of results, and manuscript preparation were conducted independently by the authors, without the use

of generative artificial intelligence for scientific content development. The authors take full responsibility for the accuracy, integrity, and originality of this work.

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