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Influence of Junk Food Advertising and Consumption on Overweight and Obesity in Surabaya Adolescents

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ABSTRACT

The prevalence of overweight and obesity among adolescents continues to increase, partly due to high consumption of junk food influenced by exposure to advertising. This study aims to determine the frequency of exposure to junk food advertising among seventh and eighth grade students at SMPN 38 Surabaya and its relationship to nutritional status.

This analytical observational research employed a cross-sectional design, conducted in 2025, involving 81 participants selected using simple random sampling based on the Slovin formula. Data were collected using a Food Frequency Questionnaire (FFQ) and analyzed with the chi-square test at a 95% confidence level ($p < 0.05$). The results revealed that the majority of participants (45.7%) were overweight, and 65.4% had a high consumption of junk food. There was a significant association between exposure to advertisements and junk food consumption ($p = 0.033$), junk food consumption and nutritional status ($p = 0.018$), and exposure to advertisements and nutritional status ($p = 0.004$). In conclusion, exposure to junk food advertisements is significantly associated with increased junk food consumption, which ultimately elevates the risk of obesity among adolescents.

Key Messages:

- *Junk food advertisements are significantly associated with adolescents' eating behavior.*
- *Increased exposure to junk food ads contributes to higher consumption of junk food among teenagers.*

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INTRODUCTION

Consuming junk food more than three times a day can increase the risk of obesity due to its high fat content and simple carbohydrates (1). In addition, exposure to fast food advertisements contributes significantly to the increasing prevalence of overweight and obesity among adolescents (2). Junk food advertisements broadcasted through various platforms, such as television, social media, and video games, trigger an increase in teenagers' desire and intention to consume the advertised products, thereby reinforcing the current obesogenic environment (3,4).

Lack of knowledge about balanced eating patterns leads some people to consume junk food without considering its nutritional value (5). Junk food is often chosen because it is perceived as more convenient than preparing healthy meals. Additionally, snacks outside of main meals can account for approximately 10% of total daily energy intake. This habit has the potential to increase intake of saturated fats and excess energy, which may exceed daily nutritional needs (6).

In 2022, nearly 390 million children and adolescents aged 5 to 19 were classified as overweight (8). The prevalence of overweight and obesity in this group has risen markedly from 8% in 1990 to 20% in 2022, affecting both genders almost equally: 19% of girls and 21% of boys (7).

Based on the results of the Indonesian Health Survey (SKI) (8), the prevalence of overweight adolescents aged 13-15 years is 12.1% and obesity is 4.1%. In East Java Province, according to BMI/U, the prevalence is 15% for overweight and 4.8% for obesity. According to the East Java Province Regional Health Research Report (9), the prevalence of overweight adolescents in East Java is 13.3% and obesity is 6%. This indicates an increase in prevalence from 2018 to 2023, with a 2.7% increase for the overweight group and a 1.2% increase for the obesity group. According to the 2018 Riskesdas results (9), the prevalence of overweight in Surabaya is 13.3% and obesity is 5.8%.

According to SKI data (2023), in Indonesia, 8.5% of children aged 10 to 14 consume fast food at least once a day, 71.5% eat it 1 to 6 times a week, and 20% eat it less than three times a month. The prevalence of the habit of eating instant food in East Java is 2.9% (≥ 1 time per day), 52.5% (1-6 times per week), and 44.6% (≤ 3 times per month). Then, based on Riskesdas (9), the prevalence of instant food consumption habits in Surabaya is 5.55% (≥ 1 time per day), 53.37% (1-6 times per week), and 41.08% (≤ 3 times per month).

A preliminary study conducted at SMPN 38 Surabaya, East Java, aimed to determine the prevalence of obesity and fast food consumption habits among students. Using BMI to assess nutritional status, the results showed that 40% of students were of healthy weight, 26.7% were overweight, and 33.3% were obese. This condition indicates that nutritional problems are quite high and are likely related to exposure to food advertisements and high consumption of junk food among adolescents.

Although several national and provincial surveys have reported the prevalence of overweight and obesity among adolescents, there is still limited research that specifically examines the combined effect of advertisement exposure and junk food consumption on adolescents in Surabaya. Therefore, this study was conducted to determine the relationship between advertisement exposure and junk food consumption with overweight and obesity status in adolescents.

METHODS

This study is a quantitative study with an analytical observational type and uses a cross-sectional design. This design was chosen because it allows researchers to see the relationship between independent and dependent variables at the same time. This study was conducted in the environment of State Junior High School (SMPN) 38 Surabaya and lasted for six months, from January 2025 to June 2025. This location was chosen because it has a large number of students and represents the characteristics of the adolescent population of junior high school age in an urban area.

The population in this study was all seventh and eighth grade students at SMPN 38 Surabaya, totaling 417 students. From this population, a sample of 81 students was taken. Sampling was conducted using simple random sampling, in which each member of the population had an equal chance of being selected as a respondent, so that the results of the study could be expected to represent the population as a whole.

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The data collection techniques in this study were divided into two types, namely primary data and secondary data. Primary data in this study were obtained directly through measurements and interactions with respondents. The data collected includes respondents' personal information, such as name, age, gender, and class. Additionally, anthropometric measurements, including weight and height, were taken to determine nutritional status based on the Body Mass Index (BMI). The researchers also used an advertising exposure frequency questionnaire to determine how often respondents were exposed to food advertisements, particularly those related to unhealthy foods. The advertising exposure frequency questionnaire used in this study was adapted from a previous study (10). Advertisement exposure was categorized into high (≥49 times/day) and low (<49 times/day). To assess fast food consumption patterns, a dietary interview was conducted using the Food Frequency Questionnaire (FFQ) over a specific period (11).

Meanwhile, secondary data included information obtained from the school, such as the total number of students and a list of student names used as the basis for the sampling process. After all the data were collected, the analysis process was carried out using the chi-square statistical test. This test was used to determine whether there was a significant relationship between the level of advertisement exposure and junk food consumption habits as well as the nutritional status of students.

RESULTS

Characteristics of Respondents

Table 1 Characteristics of Respondents

Characteristics		n	%
Gender	Boys	37	45,7
	Girls	44	54,3
Total		**81**	**100**
Class	7	47	58
	8	34	42
Total		**81**	**100**

Source: Primary Data 2025

The proportion of female students was slightly higher than male students (54.3% vs. 45.7%), suggesting that the sample was relatively balanced in terms of sex distribution. Meanwhile, more than half of the participants were from 7th grade (58%), indicating that younger adolescents were more represented in this study compared to those in 8th grade (42%). This distribution provides a relevant overview of early adolescence, a critical stage where dietary habits and body weight status begin to develop.

Advertisement Exposure

Table 2 Advertisement Exposure

Advertisement Exposure	**n**	**%**
Low	40	49,4
High	41	50,6
Total	**81**	**100**

Source: Primary Data 2025

The findings showed that most respondents had high exposure to junk food advertisements (50.6%), while 49.4% had low exposure. This indicates that junior high school students are frequently exposed to fast food advertisements through various media such as television, radio, and especially social media on their smartphones. The high level of advertisement exposure may influence their perceptions and consumption habits toward junk food.

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Junk Food

Table *3* Junk Food

Junk food	**n**	**%**
Very often	16	19,8
Often	53	65,4
Rarely	12	14,8
Total	**81**	**100**

Source: Primary Data 2025

The results showed that the majority of respondents were in the “often” consumption category (65.4%), followed by “very often” consumption (19.8%), and only 14.8% consumed junk food “rarely.” These findings indicate that most adolescents have a high frequency of junk food consumption, reflecting a dietary pattern dominated by energy-dense, nutrient-poor foods.

Nutritional Status

Table *4* Nutritional Status

Nutritional Status	**n**	**%**
Underweight	5	6,2
Normal	33	40,7
Overweight	37	45,7
Obese	6	7,4
Total	**81**	**100**

Source: Primary Data 2025

The results showed that the largest proportion of respondents were classified as overweight (45.7%), followed by those with a normal nutritional status (40.7%). Meanwhile, 7.4% of respondents were obese, and only 6.2% were underweight. These findings indicate that almost half of the adolescents in this study experienced excess weight, either overweight or obese, highlighting a potential public health concern.

Cross Tabulation of the Relationship Between Advertising Exposure and Junk Food Consumption

Table 1 Cross Tabulation of the Relationship Between Advertising Exposure and Junk Food Consumption

Advertisement Frequency	FFQ *Junk food*						n	*p-value*
	Very often		Often		Rarely			
	n	%	n	%	n	%		
Low exposure	6	15	24	60	10	25	40	0,033
High exposure	10	24,4	29	70,7	2	4,9	41	
Total	**16**	**19,8**	**53**	**65,4**	**12**	**14,8**	**81**	

Source: Primary Data 2025

Based on the chi-square test, a p-value of 0.033 ($p < 0.05$) was found, indicating a strong association between viewing advertisements and consuming junk food more frequently. Most respondents with high exposure levels consumed junk food frequently (70.7%) and very frequently (24.4%), while respondents with low exposure levels were more likely to fall into the frequent (60%) and infrequent (25%) categories.

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Cross Tabulation of the Relationship Between Junk Food Consumption and Overweight and Obesity Nutritional Status

Table 9 Cross Tabulation of the Relationship between Junk Food Consumption and Overweight and Obesity Nutritional Status

	Status Gizi								n	*p-value*
	Underweight		Normal		Overweight		Obese			
	n	%	n	%	n	%	n	%		
Very often	1	6,2	7	43,8	4	25	4	25	16	0,018
Often	3	5,7	18	34	30	56,6	2	3,9	53	
Rarely	1	8,3	8	66,7	3	25	0	0	12	
Total	**5**	**6,2**	**33**	**40,7**	**37**	**45,7**	**6**	**7,4**	**81**	

Source: Primary Data 2025

The analysis results show that most respondents are overweight (45.7%), followed by normal weight (40.7%), obese (7.4%), and underweight (6.2%). Respondents who frequently consume junk food were predominantly overweight (56.6%), while those who rarely consumed it had a higher proportion of obesity (25%). In the group that rarely consumed junk food, the majority had normal weight (66.7%) and no cases of obesity were found. The chi-square test showed a significant association between the frequency of junk food consumption and nutritional status (p = 0.018).

Cross-tabulation of the Relationship between Advertising Exposure and Overweight and Obesity Nutritional Status

Table 2 Cross-tabulation of the Relationship between Advertising Exposure and Overweight and Obesity Nutritional Status

Advertisement Exposure	Nutritional Status								n	*p-value*
	Underweight		Normal		Overweight		Obese			
	n	%	n	%	n	%	n	%		
Low Exposure	5	12,5	21	52,5	13	32,5	1	2,5	40	0,004
High Exposure	0	0	12	29,3	24	58,5	5	12,2	41	
Total	**5**	**6,2**	**33**	**40,7**	**37**	**45,7**	**6**	**7,4**	**81**	

Source: Primary Data 2025

Most respondents in the limited advertising exposure group had good nutritional status (52.5%), and only 2.5% were overweight. However, in the high advertising exposure group, more respondents were overweight (58.5%) or obese (12.2%), and none were underweight. The results of the chi-square test showed a strong association between the amount of advertising exposure and respondents' health status (p = 0.004).

DISCUSSION

Characteristics of Respondents

Although the proportion of male and female respondents was relatively balanced, differences in body composition and metabolism between genders may influence nutritional outcomes. Researchers have revealed that men and women have different eating patterns and body types. Men generally have greater muscle mass and a higher basal metabolic rate than women. This means that men require more nutrients than women (12).

Respondents were distributed across grades 7 and 8, allowing for comparisons across age and educational levels, which can influence perceptions of advertising and dietary behavior. This difference is important in the context of unhealthy food consumption (junk food), as age and educational level can influence perceptions of advertising and eating habits.

Advertising Exposure Frequency

The relatively balanced distribution of advertising exposure categories enabled meaningful comparison of its relationship with junk food consumption and nutritional status. This finding is supported by previous studies, where the majority of high school students spend more than 4 hours

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per day using gadgets. This prolonged screen time has the potential to increase exposure to food promotional content, which can indirectly influence their consumption patterns (13).

It has been proven that viewing advertisements for foods high in fat, sugar, and salt (HFSS) can change the consumption patterns of adolescents. Viewing food advertisements causes people of all ages to eat more, although the effect is greater on younger people. This means that advertisements not only change what people want to eat, but can also directly increase the amount of energy people consume and their risk of obesity (14). Overall, these results indicate that the type of product advertised influences consumption levels, with more convenient and affordable products tending to be consumed more frequently. With a balanced distribution between the two exposure categories, this study has the potential to identify significant differences in junk food consumption patterns or nutritional status based on advertising exposure levels, as well as support the development of more effective media-based interventions.

FFQ Junk Food

Most respondents reported frequent junk food consumption, consistent with previous studies that also identified high prevalence of fast food intake among adolescents. This aligns with a previous study by Warapsari (2025), which showed that the majority of respondents (63.6%) fell into the “frequent” category for fast food consumption, while 36.4% of respondents consumed it “rarely.” This indicates a high trend in fast food consumption among adolescents (15). This is also in line with the results of Oktaviany's (2024) study, which found that 81.7% of students frequently consume fast food (16).

Other studies have also revealed that high junk food consumption frequency does not always reflect adequate nutritional understanding, potentially leading to malnutrition, whether in the form of overweight or undernutrition (17). The abundance of fast food has been linked to higher body fat and poorer nutrition in school-aged children, which can also cause them to start menstruating earlier. This shows that unhealthy eating habits from an early age can affect physiological development and long-term health (18).

Contributing factors to junk food consumption among adolescents are also linked to poor sleep quality, frequent intake of junk food, and a high contribution of energy and fat from junk food, which together increase the risk of overweight (19).

Nutritional Health

Nutritional status reflects an individual’s overall health by showing whether their nutrient intake meets the body’s needs. When intake consistently exceeds what the body requires, it can result in overweight, often linked to excessive calories from macronutrients such as fats, proteins, and carbohydrates. Maintaining a balance between calories consumed and calories burned through physical activity is essential for healthy nutrition. Additionally, lifestyle factors such as sleep duration may indirectly influence overweight (20).

Nearly half of the respondents were overweight or obese, highlighting overweight as the dominant nutritional issue among adolescents. Previous studies have shown that the majority of respondents are overweight, accounting for 56.7%, followed by 13.3% of respondents who are obese, and 23.3% (16). The high proportion of overweight individuals indicates that nutritional issues are now a major concern, particularly among adolescents. This trend can be linked to changes in eating patterns, such as high consumption of fast food and low physical activity, which contribute to daily energy imbalance.

This condition is related to the habit of consuming high-energy foods such as junk food and high exposure to advertisements for unhealthy foods. Adolescents who are frequently exposed to advertisements tend to be more interested in foods high in fat, sugar, and salt, which can trigger weight gain and nutritional disorders (21).

The Relationship Between Advertising Exposure and Junk Food Consumption

The analysis shows a significant relationship between exposure to junk food advertising and consumption behavior (p=0.033). Students who were more frequently exposed to food advertisements tended to consume junk food more often. This finding supports previous research indicating that persuasive food marketing increases adolescents’ likelihood of choosing high-calorie, nutrient-poor

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foods. Advertising appears to act as a trigger that strengthens preference for fast food, which, if sustained, may contribute to unhealthy eating habits.

These results support the idea that viewing junk food advertisements on TV, social media, or other digital platforms can influence adolescents' eating patterns. Such exposure can increase desire, intention, and decision to consume unhealthy foods. The marketing techniques used are also highly strategic, such as displaying visually appealing images, using memorable slogans, and involving influencers or celebrities to attract adolescents' attention (22).

From a public health perspective, this situation is concerning because the consumption patterns formed through advertising can contribute to an increased risk of obesity and chronic diseases in the future.

The Relationship Between Junk Food Consumption and Overweight and Obesity

Junk food consumption was significantly associated with students' nutritional status (p=0.018). Adolescents with higher levels of junk food intake were more likely to fall into overweight or obese categories. This aligns with existing evidence that frequent consumption of energy-dense foods contributes to positive energy balance and fat accumulation. The finding underscores that dietary patterns in adolescence play a critical role in shaping long-term health risks, including obesity and related metabolic disorders.

Thus, the more junk food a person consumes, the greater the likelihood that they will be overweight or obese. This is consistent with the idea that consuming foods high in calories, fat, and sugar without enough exercise and a balanced diet can lead to nutritional problems, particularly obesity. Other studies have shown that the habit of consuming junk food and spending too much time staring at screens is closely linked to an increased risk of overweight in adolescents (23).

Excessive consumption of junk food can have serious negative effects on physical health. Fast food, which is rich in calories, sugar, and salt, can increase the risk of obesity and contribute to the onset of degenerative diseases such as diabetes, hypertension, high cholesterol, and digestive and reproductive problems (24).

The Relationship Between Exposure to Junk Food Advertising and Overweight and Obesity Nutritional Status

A direct association was also observed between advertising exposure and overweight/obesity status (p=0.004). This suggests that the influence of advertising extends beyond eating behavior, potentially shaping adolescents' nutritional outcomes more broadly. Similar findings have been reported in other studies where aggressive junk food marketing was linked not only to higher consumption but also to increased prevalence of obesity in children and adolescents. This highlights the urgent need for stronger regulation of food marketing targeting younger populations.

This aligns with the view that food advertisements, especially for junk food, play a significant role in shaping adolescents' consumption behavior. Intensive exposure to advertisements, especially those with visually appealing and emotionally charged content, can drive interest in high-calorie, high-fat, and high-sugar foods, thereby increasing the risk of obesity (25).

The impact of these marketing strategies is clear: increased consumption of foods that do not meet nutritional standards and the promotion of unhealthy eating patterns from an early age. This poses a serious threat to the nutritional status and health of children and adolescents and directly contributes to the rise in obesity prevalence.

This study has certain limitations. The questionnaire did not comprehensively capture other supporting factors that could influence adolescents' nutritional status, such as physical activity, nutrition knowledge, and pocket money. These unmeasured variables may have contributed to overweight and obesity outcomes, and their absence limits the completeness of the analysis.

Overall, the study provides strong evidence that junk food advertising significantly influences adolescents' eating behavior and nutritional status. These findings underscore the urgent need for multi-sectoral interventions—including school-based nutrition education, parental guidance, and government regulation of unhealthy food marketing—to mitigate the rising prevalence of adolescent obesity in urban Indonesia.

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CONCLUSION

This study found a significant relationship between exposure to junk food advertisements, junk food consumption, and the prevalence of overweight and obesity among adolescents in Surabaya. Adolescents who were more frequently exposed to junk food advertising tended to consume such foods more often, which increased their risk of being overweight or obese. These findings highlight the urgent need for preventive measures through multi-sectoral collaboration. Schools should strengthen nutrition education programs that help students critically evaluate food advertisements and make healthier dietary choices, while parents play a key role in guiding eating habits at home. At the same time, government and media regulators are encouraged to implement stricter controls on junk food advertising targeted at children and adolescents. An integrated approach involving educators, families, health professionals, and policymakers is essential to create a supportive environment that promotes healthier eating patterns and reduces the burden of adolescent obesity in Indonesia.

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CONFLICTS OF INTEREST

The authors declare no conflicts of interest.

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