

Street food snacking habits, physical activity, and electronic media exposure in relation to obesity in elementary school students

Anggun DWI SYAKIRAH, Fivi MELVA DIANA, RESMIATI

Department of Nutrition, Faculty of Public Health, Andalas University, Padang, West Sumatra, Indonesia.

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ABSTRACT

Introduction: Obesity is caused by an imbalance between incoming energy due to the consumption of more calories than energy expended. Excessive fat accumulation has serious and long-term health effects. This can be supported by lifestyles such as consumption of roadside snacks that are high in sugar, salt, and fat, but low in micronutrients and fiber. This study aims to determine the characteristics of respondents and analyze the relationship of *street food* snacking habits, physical activity, and exposure to electronic media with the incidence of obesity in elementary school students at SD Adabiah Kota Padang in 2023.

Methods: Research with *cross sectional design*. The population in this study were students of SD Adabiah Padang grades 1-5 with a total sample of 141 students, selected by *proportional random sampling* technique. Data on *street food* snacking habits and exposure to electronic media were obtained using a questionnaire, physical activity measured by PAQ-C (*Physical Activity Questionnaire for Children*), and obesity measured by IMT/U. Data were analyzed using the *Chi-Square* test.

Results: The number of respondents with obese nutritional status (19.9%), frequent *street food snacking* habits (62.4%), less physical activity (65.2%), and high exposure to electronic media (53.9%). Statistical test results showed that there was no significant relationship between *street food snacking* habits (p -value=0.281), physical activity (p -value=0.443), and expo-

sure to electronic media (p -value=0.701) with the incidence of obesity in elementary school students.

Conclusion: The results showed no association between *street food* snacking habits, physical activity, and exposure to electronic media with the incidence of obesity in elementary school students.

KEYWORDS

School children, *gadgets*, diet, *sedentary lifestyle*.

INTRODUCTION

According to WHO (2000) obesity is an excessive accumulation of fat due to an imbalance of *energy intake* (*energy intake*) with energy used (*energy expenditure*) for a long time¹. High energy intake is caused by excessive food consumption, while low energy output is caused by low physical activity². This is supported by lifestyle changes such as eating habits that have changed from traditional to *western food*, namely eating outside the home (snacks)². Snacks are usually sold on the side of the road or in other crowded places (*street food*)³. Snacks generally have unbalanced nutritional content such as high fat, sugar, and salt but low fiber, vitamins, and minerals². So that if consumed in excess, snacks can cause nutritional problems, namely excess energy intake or obesity⁴.

WHO (2017) states that from 1975-2016 (± 40 years), the number of children suffering from obesity increased 10-fold⁵. Then Riskesdas successively (2007), (2010), (2013), and (2018) showed the prevalence of obesity in school children (7.9%), (9.2%), (8.8%), and (9.2%)⁶⁻⁹. According to the Riskesdas data of West Sumatra province (2018), the prevalence of obesity in school-age children is (5.9%). This prevalence is still high compared to several other provinces such as West

Correspondencia:

Fivi Melva Diana
fividiana0503@ph.unand.ac.id

Sulawesi (5.5%), Southeast Sulawesi (5.4%), Maluku (4.4%), West Nusa Tenggara (3.9%), Central Sulawesi (3.9%), and the lowest in East Nusa Tenggara (2.4%)⁹. Furthermore, based on Riskesdas data (2018), Padang City has an obesity prevalence of 6.34%¹⁰. Based on data from the Padang City Health Office (2015), the Andalas Health Center working area has the highest prevalence of obesity (6.1%). Adabiah Elementary School (SD) has the highest prevalence of obesity in the Andalas Puskesmas working area in 2022, namely (18.04%).

Obesity can be caused by: lifestyle changes (diet and physical activity), snack habits, and exposure to electronic media. Snacks that are consumed as snacks can contribute about 10% of energy from the total energy needs in a day. This habit of snacking with high energy intake results in high intake of saturated fat and total energy in a day, so that a person's nutritional adequacy level increases than it should¹¹. In addition, lifestyle changes also affect the low intensity and frequency of physical activity which can trigger obesity. It can be seen that currently sports activities and activities that use physical activity have decreased and then replaced with electronic media such as *video games*, *smartphones*, laptops, computers, televisions, and so on.¹² As time goes by, the development of technology is also getting faster. This causes children to prefer watching television and playing *gadgets* or electronic games such as *video games* that require little energy^{12,13}.

Based on the description above, a study was conducted with the aim of knowing the characteristics of respondents (age, gender, incidence of obesity, *street food* snacking habits, physical activity, and exposure to electronic media) and knowing the relationship between *street food* snacking habits, physical activity, and exposure to electronic media with the incidence of obesity in elementary school students at SD Adabiah Kota Padang in 2023.

METHODS

Quantitative research with *cross sectional* research design. The research was conducted in January - June 2023 at SD Adabiah Padang City. The population was 410 students in grades 1 - 5 with ages 7-12 years. The sample was students of SD Adabiah Padang who were active and met the inclusion criteria (students of SD Adabiah Padang aged 7-12 years who were willing to become respondents and had agreed to *informed consent* and were present when the study was conducted. Sampling was done by *proportional random sampling*. 141 samples were calculated using the Lemeshow formula

$$n = \frac{Z^2_{1-\alpha/2} P (1 - P)N}{d^2 (N - 1) + Z^2_{1-\alpha/2} P (1 - P)}$$

Description:

n = sample size.

N = population size, number of students in grades 1-5 SD Adabah Kota Padang (410 students).

$Z_{1-\alpha/2}$ = z value at the degree of significance (95% = 1.96).

P = proportion of a particular case to the population, proportion of cases based on previous studies (0.14).

d = degree of deviation from the desired population (5% = 0.05).

The data collection consisted of primary data (weight and height, *street food* snacking habits, physical activity, and electronic media exposure) and secondary data (name, gender, place/date of birth, class, and school profile). Data (age, gender, *street food* snacking habits, and electronic media exposure) were obtained through interviews with questionnaires. *Physical activity* data using the PAQ-C (*Physical Activity Questionnaire for Children*)¹⁴. Nutritional status data was obtained from measuring body weight and height and then calculated z-score using WHO Anthroplus *software* based on IMT/U. Data were analyzed using univariate and bivariate analysis using the *Chi-Square Test* ($\alpha=0.05$). Data analysis using SPSS Statistics 23 for Windows *software*.

RESULTS

Table 1 shows that the number of respondents with the most age is 9 years old as many as 35 people (24.8%), the most gender is female as many as 75 people (53.2%), the most in-

Table 1. Characteristics of research respondents

Characteristics	f	%
Age		
7 years	26	18.4
8 years	28	19.9
9 years	35	24.8
10 years	29	20.6
11 years	21	14.9
12 years	2	1.4
Gender		
Male	66	46.8
Female	75	53.2
Incidence of Obesity		
Obesity	28	19.9
Not obese	113	80.1
Street Food Habits		
Frequent (≥ 3 times/week)	88	62.4
Rarely (< 3 times/week)	53	37.6

Table 1 continuation. Characteristics of research respondents

Characteristics	f	%
Physical Activity		
Less (average score < 2.5)	92	65.2
Good (average score of questionnaire items \geq 2.5)	49	34.8
Electronic Media Exposure		
High (duration of watching TV, playing <i>video games</i> , and using <i>gadgets</i> \geq 1 hour/day and exposure to culinary advertisements/programs \geq 2 hours/day)	76	53.9
Low (duration of watching TV, playing <i>video games</i> , and using <i>gadgets</i> <1 hour/day and exposure to culinary advertisements/programs <2 hours/day)	65	46.1
TOTAL	141	100

incidence of not obese as many as 113 people (80.1%), the most *street food* snacking habits in the frequent category as many as 88 people (62.4%), the most physical activity in the less category as many as 92 people (65.2%), and the most exposure to electronic media in the high category as many as 76 people (53.9%). The gender of the respondents was mostly female, 75 people (53.2%).

Table 2 shows that respondents who have frequent *street food* snacking habits (\geq 3 times / week) with nutritional status are not obese as many as 73 people (64.6%) more than those who have *street food* snacking habits rarely (<3 times / week) as many as 40 people (35.4%). Statistical test results showed that there was no significant relationship between *street food* snacking habits and the incidence of obesity ($p>0.05$). The number of respondents with good physical activity (average score of questionnaire items \geq 2.5) who had obese nutritional status was 41 people (36.3%) more than those who had less physical activity (average score < 2.5), namely 72 people (63.7%). Statistical test results showed that there was no significant relationship between physical activity and the incidence of obesity ($p>0.05$). Furthermore, respondents who have high electronic media exposure (duration of watching TV, playing

Table 2. Relationship between street food habits, physical activity and electronic media exposure with the incidence of obesity in Adabiah Elementary School Students in 2023

Independent Variable	Incidence of Obesity				p-value
	Obesity		Not Obese		
	f	%	f	%	
Street Food Habits					
Frequent (\geq 3 times/week)	15	53.6	73	64.6	0.281
Rarely (<3 times/week)	13	46.4	40	35.4	
Physical Activity					
Deficient (average score of questionnaire items < 2.5)	20	71.4	72	63.7	0.443
Good (average score of questionnaire items \geq 2.5)	8	28.6	41	36.3	
Electronic Media Exposure					
High (duration of watching TV, playing <i>video games</i> , and using <i>gadgets</i> \geq 1 hour/day and exposure to culinary advertisements/programs \geq 2 hours/day)	16	57.1	60	53.1	0.701
Low (duration of watching TV, playing <i>video games</i> , and using <i>gadgets</i> <1 hour/day and exposure to culinary advertisements/programs <2 hours/day)	12	42.9	53	46.9	
TOTAL	28	100	113	100	

Chi-square test significant $p<0.05$.

video games, and using *gadgets* ≥ 1 hour / day and exposure to advertisements / culinary programs ≥ 2 hours / day) with nutritional status are not obese as many as 60 people (53.1%) more than those who have low electronic media exposure (duration of watching TV, playing *video games*, and using *gadgets* < 1 hour / day and exposure to advertisements / culinary programs < 2 hours / day) as many as 53 people (46.9%). The results of statistical tests showed that there was no significant relationship between exposure to electronic media and the incidence of obesity ($p > 0.05$).

DISCUSSION

Respondent Characteristics

Based on this study, it was found that the proportion of respondents with obese nutritional status was less (19.9%) than respondents with non-obese nutritional status (80.1%). The results of this study are in line with Bokau's research (2023), where respondents with obese nutritional status were fewer (29.4%) than those who were not obese (70.6%)¹⁵. Based on the results of this study it was also found that respondents with obese nutritional status were mostly aged 9 years (25%) and the least aged 12 years (3.6%). The results of this study are in line with Agustina's research (2019), where respondents with obese nutritional status were mostly aged 9-10 years (55.6%)¹⁶. This is because puberty occurs at the age of 8 years in girls and 9 years in boys.⁽¹⁷⁾ During puberty, physical changes occur including weight gain. Weight gain occurs due to changes in body composition¹⁷. According to IDAI (Indonesian Pediatric Association), changes and increases in body composition result in increased energy and nutrient requirements. So that there is an increase in consumption which if excessive can cause obesity.

The findings in this study also stated that obese nutritional status respondents were more common in males (53.6%) than females (46.4%). This is in accordance with the study of Banjarnahor et al (2022) which states that boys have twice the risk of being obese than girls¹⁸. This is due to the higher basal metabolic rate and physical activity in boys compared to girls, so their caloric needs are also higher. In addition, the nutrient requirements of boys at the age of 10- 12 years are greater because the *growth spurt* is greater than that of girls¹⁹.

Based on the results of this study, it was found that respondents with frequent *street food* snacking habits were greater (62.4%) compared to the frequency of *street food* snacking habits rarely (37.6%). The results of this study are in line with Juliniar's research (2021) where it was found that respondents with frequent *street food* snacking habits were greater than those who rarely snacked²⁰. Currently, more and more traders offer various types of *street food snacks*. This development can encourage the habit of consuming snacks, especially in school children. So that it can cause excess energy intake or can cause an increase in intake that exceeds the needs resulting in obesity²¹.

The results of this study showed that respondents with good physical activity levels (34.8%) were lower than respondents with less physical activity (65.2%). This is in line with Dunga's research (2020) where students with good physical activity are less than those with less physical activity²². The findings in this study also showed that respondents were more exposed to high electronic media (53.9%) than low (46.1%). On average, respondents had a high duration of watching television, playing *video games*, and using *gadgets*. However, the majority of respondents were exposed to food and beverage advertisements through low electronic media. This is in line with Uttari's research (2017) which states that children who have *screen time* activities above the average are high²³. Another study also showed that children exposed to food and beverage advertisements through low electronic media were more than those exposed to food and beverage advertisements through high electronic media²⁴.

The Relationship between Street Food Habits and the Incidence of Obesity

The results of this study indicate that there is no significant relationship between *street food* snacking habits and the incidence of obesity ($p > 0.05$). The results of this study are in accordance with Djamaluddin's research (2022) which states that there is no relationship between snacking habits and the incidence of obesity in elementary school students MI Khoiril Huda Tangerang City which is characterized by $p \text{ value} = 1,000$ ($p\text{-value} > 0.05$)²⁵. This can be caused by the portion of snacks consumed by students is still in an amount that is not excessive. Based on the results of interviews, it can be seen that students generally only consume 1 or 2 types of snacks in one day. According to Rahmiwati (2019) snacks only contribute a small intake of daily needs so that they cannot be used as the main factor in influencing a person's nutritional status. So if snacks are consumed only in small portions, it will not have a significant effect on nutritional status²⁶.

Relationship between Physical Activity and the Incidence of Obesity

The results of this study indicate that there is no significant relationship between *street food* snacking habits and the incidence of obesity ($p > 0.05$). The results of this study are in line with Rahmiwati's research (2019) which states that there is no relationship between physical activity and the incidence of obesity in elementary school students ($p > 0.05$). Each person has a different energy output, so the type and duration of physical activity of each person cannot be equated just by looking at the general description of physical activity. The results of this study are supported by Rahmiwati's (2019) research, which states that physical activity can encourage a decrease in fat tissue. The intensity of physical activity or energy output from physical activity varies for each person, according to their level of physical fitness²⁶.

Relationship between Electronic Media Exposure and the Incidence of Obesity

The results of this study indicate that there is no significant relationship between *street food* snacking habits and the incidence of obesity ($p>0.05$). The results of this study are in accordance with Aini's research (2021) which states that there is no relationship between exposure to electronic media and the incidence of obesity in elementary school students at SD RW 02 Cipedak ($p>0.05$)¹¹. Electronic media exposure does not directly affect nutritional status. There needs to be involvement of other factors such as diet, genetics, education about healthy lifestyles, and others. In addition, not all types of content exposed by electronic media promote unhealthy lifestyles. There are many sources of information and entertainment that provide education about the importance of health and physical activity, so it can be used as motivation for children. Each individual has a different response to electronic media exposure. Some children may be more susceptible to negative effects, while others may be more aware of the importance of maintaining good health²⁷.

CONCLUSIONS

The results showed that the characteristics of respondents were mostly 9 years old (24.8%), more than half of the gender was female (53.2%), the majority had non-obese nutritional status (80.1%), more than half had frequent *street food* snacking habits (62.4%), more than half had less physical activity (65.2%), and more than half had high electronic media exposure (53.9%). There was no significant association between *street food* snacking habits, physical activity, and electronic media exposure with the incidence of obesity ($p>0.05$).

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