



Food Consumption Patterns and Family Income as Determinants of Obesity among Elementary School Children

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Article Info	Abstract
<i>Article History:</i> Received : 13-09-2026 Approved : 23-09-2026 Published : 30-09-2026 <i>Keywords:</i> <i>Food Consumption Patterns; Family Income; Obesity; Elementary School Children; Nutritional</i>	Childhood obesity remains a growing nutritional problem influenced by food consumption patterns and family income. According to the World Health Organization (2024), an estimated 390 million children and adolescents aged 5-19 years were overweight in 2022, of whom 160 million were living with obesity, and the prevalence continues to rise worldwide, including in Indonesia. This study aimed to determine the relationship between food consumption patterns and family income with the incidence of obesity among grade 3, 4, and 5 children at MIN 1 Tangerang. A quantitative study with a cross-sectional design was conducted, involving 189 children selected through stratified random sampling. Data were analyzed univariately and bivariate using the chi-square test and Fisher's exact test. The results showed that most respondents (89.4%) had an adequate food consumption pattern, and most families (63.5%) had an income below the Tangerang Regency Minimum Wage of IDR 4,601,988. The Fisher freeman halton exact test and chi-square test revealed The chi-square test revealed a significant relationship between food consumption patterns and the incidence of obesity ($p = 0.005$), as well as between family income and the incidence of obesity ($p = 0.009$). It can be concluded that both food consumption patterns and family income are significantly associated with childhood obesity. Schools and parents are encouraged to provide education on balanced nutrition and to promote regular physical activity to help maintain children's health and prevent the rising incidence of obesity among school-age children. © 2026 Poltekkes Kemenkes Pontianak

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1. INTRODUCTION

Obesity constitutes one of the leading risk factors contributing to elevated rates of morbidity and mortality worldwide. According to the World Health Organization (WHO, 2024), approximately 2.5 billion adults globally are overweight, of whom 890 million are living with obesity. Among children and adolescents aged 5-19 years, more than 390 million were reported to be overweight in 2022, including 160 million living with obesity, and this figure is projected to continue rising in the coming years (WHO, 2024). These statistics indicate that obesity among school-age children has become a public health issue that warrants serious attention.

Obesity, or excess body weight, is a chronic condition arising from the excessive accumulation of body fat due to an imbalance between energy intake and energy expenditure. Obesity among school-age children most commonly occurs within the 5-12 year age range (Norberta 2024). It may result from poor dietary habits, including the excessive consumption of foods high in fat, carbohydrates, and sugar, combined with insufficient physical activity. This condition may, in turn, reduce children's concentration during learning, making them more prone to drowsiness and reduced engagement in class, which can

ultimately affect their academic performance (Xu et al. 2025).

Obesity among school-age children may be attributed to a range of factors. Direct factors include genetic predisposition inherited from parents, excessive eating habits, and insufficient physical activity. Indirect factors include environmental influences and the family's economic condition. Urban environments that offer easy access to fast food high in calories, fat, and cholesterol may increase the risk of obesity, while family income also influences access to healthy food (Wansyaputri, R. R., Ekawaty, F., & Nurlinawati 2022).

Dietary patterns encompass the type, quantity, and frequency of food consumed by children throughout the day. School-age children generally require approximately 250 grams of carbohydrates, 40 grams of protein, and 55 grams of fat per day. However, the current dietary patterns of school children tend to be dominated by snacks and packaged sweet foods and beverages that are particularly appealing to children. Excessive consumption of such foods may lead to fat accumulation in the body and, if not balanced with appropriate nutritional intake, may result in childhood obesity (Xu et al. 2025). Based on this background, the present study aims to determine the relationship between food consumption patterns and family income with the incidence of obesity among grade 3, 4, and 5 children at MIN 1 Tangerang.

2. METHOD

This study employed a quantitative method with a cross-sectional design, in which data on the dependent and independent variables were collected simultaneously. The dependent variable in this study was the incidence of obesity among children at MIN 1 Tangerang, while the independent variables were food consumption patterns and family income. Obesity status was determined using body mass index for age (BMI/A) z-score, calculated from measured body weight and height, and classified according to the WHO growth reference for children age 5-19 years as normal (-2 SD to $+1$ SD), overweight ($>+1$ SD to $+2$ SD), or obese ($>+2$ SD). The study was conducted in June 2024 at MIN 1 Tangerang, involving 189 children from grades 3, 4, and 5 as the sample, selected using a stratified random sampling technique. Data were collected through a structured questionnaire and subsequently analyzed univariately to describe the characteristics of each variable, as well as bivariate or the Fisher-Freeman-Halton exact test when more than 20% of cells had expected counts below 5 using the chi-square test at a significance level of 0.05 to examine the relationships between variables, with data processed using SPSS statistical software.

This study adhered to the following ethical principles: (1) informed consent, whereby the purpose of the study was explained to respondents before they agreed to participate, with the right to decline participation without coercion; (2) anonymity, whereby respondents' identities were not recorded in either the data collection instruments or the research report, and codes were used instead; (3) confidentiality, whereby all information obtained from respondents was kept strictly confidential; and (4) beneficence, whereby the research was designed to provide maximum benefit to respondents and the broader community. The study protocol was reviewed and approved by the Yatsi Madani University and ethical clearance no. 100/LPPM-UYM/V/2024, minimizing any potential adverse effects.

3. RESULTS AND DISCUSSION

3.1 Respondent Characteristics

Table 1. Frequency Distribution of Respondents by Characteristics

Characteristic	Frequency (f)	Percentage (%)
Parental Employment Status		
Employed	130	68.8
Unemployed	59	31.2
Parental Education		
Did not complete elementary school	0	0
Elementary school	9	4.8
Junior high school	11	5.8
Senior high school	164	86.8
Bachelor's degree (S1)	5	2.6
Parental Occupation		
Homemaker	66	34.9
Teacher	10	5.3
Entrepreneur	14	7.4
Laborer	13	6.9
Private employee	86	45.5
Total	189	100.0

Based on Table 1, of the 189 respondents, the majority of parents were employed (68.8%), had senior high school as their highest level of education (86.8%), and worked as private employees (45.5%).

3.2 Food Consumption Patterns

Table 2. Frequency Distribution of Respondents by Food Consumption Pattern

Food Consumption Pattern	Frequency (f)	Percentage (%)
Good (>75%)	3	1.6
Adequate (50-75%)	169	89.4
Poor (<50%)	17	9.0
Total	189	100.0

Based on Table 2, of the 189 children, 1.6% had a good food consumption pattern, 89.4% had an adequate pattern, and 9.0% had a poor pattern at MIN 1 Tangerang. These findings are consistent with (Dewita 2021) who reported a good food consumption pattern in 17.6% of respondents, and with (Wansyaputri, R. R., Ekawaty, F., & Nurlinawati 2022), who found a significant relationship between dietary patterns and the incidence of obesity ($p = 0.013$). Food consumption patterns reflect the type, quantity, and composition of foods consumed by children on a daily basis; consumption of foods high in energy, fat, and simple carbohydrates but low in fiber may lead to caloric imbalance and, consequently, excessive body fat accumulation (Riamah, Syarifah, A. 2023).

Children in the school environment tend to frequently consume snacks such as fish cakes, sausages, nuggets, meatballs, biscuits, bread, and chips, as well as sweetened packaged beverages, often more than twice a day. This tendency is largely attributable to children's limited understanding of the adverse effects of unhealthy snacks, combined with the influence of appearance, taste, and affordability (Riamah, Syarifah, A. 2023). The researchers assume that children with a poor food consumption pattern are more likely to purchase snacks around the school and are less engaged in physical or extracurricular activities, thereby placing them at greater risk of excess body weight.

3.3 Family Income

Table 3. Frequency Distribution of Respondents by Family Income

Family Income	Frequency (f)	Percentage (%)
≥ Regional Minimum Wage (IDR 4,601,988)	69	36.5
< Regional Minimum Wage (IDR 4,601,988)	120	63.5
Total	189	100.0

Based on Table 3, of the 189 families, 36.5% had an income above the Tangerang Regency Minimum Wage, while 63.5% had an income below this threshold. Family income refers to the amount of money obtained from various sources to meet daily needs, including the family's food requirements, with the current Tangerang Regency Minimum Wage set at IDR 4,601,988 per month (Handayani & Yulistiyo, 2023). As family income increases, the proportion of expenditure allocated to fruits, vegetables, and other nutritious foods tends to increase as well, whereas limited income restricts a family's access to sufficient and high-quality food (Sahdina et al., 2023).

Children from higher-income families also tend to have easier access to high-energy foods and beverages, as well as facilities that support a more sedentary lifestyle (Aryandi et al., 2023). The researchers assume that family income influences the type and quantity of food available to children, such that families with higher incomes have a greater capacity to fulfill children's demands for particular foods and snacks.

3.4 Relationship between Food Consumption Patterns and the Incidence of Obesity in Children

Table 4. Relationship between Food Consumption Patterns and the Incidence of Obesity in Children

Food Consumption Pattern	Normal	Overweight	Obese	Total	p-value
Good	1 (33.3%)	2 (66.7%)	0 (0%)	3 (100%)	0.005
Adequate	124 (73.4%)	30 (17.8%)	15 (8.9%)	169 (100%)	
Poor	6 (35.3%)	6 (35.3%)	5 (29.4%)	17 (100%)	

Because five of the nine cells (55.6%) had expected counts below 5, the fisher freeman halton exact test was applied and yielded a p-value of 0.005 ($p < 0.05$), indicating a statistically significant relationship between food consumption patterns and the incidence of obesity among children at MIN 1 Tangerang. This finding is consistent with the energy balance theory, which posits that energy intake in excess of the body's requirements is stored as fat. Dietary patterns encompassing portion size, energy density, frequency, and the types of food consumed daily play an important role in weight regulation among children (Almatsier, 2020). Children who frequently consume high-energy foods such as eggs, fish, and sweet potatoes more than three times a day, as well as fast food such as burgers and instant noodles at least four times a week, are at risk of excessive caloric intake, which increases the risk of obesity (Dewita, 2021; Wansyaputri et al., 2021).

The researchers assume that children with a poor food consumption pattern are more prone to excess body weight, as they tend to consume staple foods in larger portions and with greater frequency than other children, while consuming comparatively little fruit and vegetables, coupled with insufficient physical activity.

3.5 Relationship between Family Income and the Incidence of Obesity in Children

The chi-square test yielded a p-value of 0.009 ($p < 0.05$), indicating a statistically significant relationship between family income and the incidence of obesity among children. This finding is consistent with Oktaviasih et al. (2023), who reported a significant relationship between family income level and children's nutritional status, with an Odds Ratio of 4.33, indicating that children from higher-income families were at greater risk of obesity compared with those from lower-income families. The educational level of the head of household also influences the family's capacity to manage nutritional needs and to select the type and quantity of food provided to children (Novita Sari & Kurniawati, 2023). Family income affects both the quality and quantity of food consumed by children within the household (Sahdina et al., 2023). The researchers assume that families with an income above the Regional Minimum Wage tend to possess greater financial capacity to meet children's demands for sweet foods, beverages, and snacks, thereby increasing children's risk of obesity.

4. CONCLUSION

This study concludes that there is a statistically significant relationship between food consumption patterns and the incidence of obesity among grade 3, 4, and 5 children at MIN 1 Tangerang ($p = 0.003$), as well as between family income and the incidence of obesity ($p = 0.009$). The majority of children exhibited an adequate food consumption pattern and came from families with an income below the Tangerang Regency Minimum Wage.

It is recommended that schools and parents provide education on balanced nutrition and encourage children to engage in regular physical activity in order to maintain students' health and to help reduce the increasing prevalence of obesity among school-age children.

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