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Original Research

The Relationship Between Parental Income and the Nutritional Status (BMI-for-age) of Students at SDN Telukjambe II, Karawang Regency

Hubungan Pendapatan Orang Tua dengan Status Gizi (IMT/U) Siswa SDN Telukjambe II, Kabupaten Karawang

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Abstract: *The phenomenon of the triple burden of malnutrition remains a serious nutritional challenge in Indonesia. In addition to undernutrition, the trend of overweight among elementary school children continues to rise, particularly in developing suburban areas as families undergo socioeconomic transitions. This study aims to analyze the relationship between parental income and the nutritional status of fifth-grade students at SDN Telukjambe II, Telukjambe Timur Subdistrict, Karawang Regency. This is a quantitative study with a cross-sectional design. The sample consisted of 31 students selected using simple random sampling. Data were collected using a questionnaire for the parental income variable, as well as direct measurements of weight and height to determine nutritional status based on the Body Mass Index for Age (BMI-for-Age). Data analysis was performed using rank Spearman correlation test. The analysis results showed that the majority of students' parents fell into the moderate (61.3%) and high (35.5%) income categories. Most students had a normal nutritional status (64.5%), but the prevalence of overweight was also quite high, at 12.9% for overweight and 16.1% for obesity.* The bivariate analysis revealed a significant positive relationship with a moderate association between parental income and children's nutritional status (p-value = 0.003; r = 0.510). Higher parental income significantly correlates with an increase in children's BMI-for-age values within this study site. However, sample size limitations suggest that this financial characteristic should be interpreted as an indirect contributor rather than the sole determinant of nutritional status in elementary school-aged children. .

Keyword: BMI-for-age, Elementary School Children, Nutritional Status, Parental Income

1. INTRODUCTION

The phenomenon of the triple burden of malnutrition remains a public health challenge in many countries, including Indonesia. This condition encompasses three forms of nutritional problems: undernutrition, micronutrient deficiencies, and overnutrition, all of which collectively impact population health (1). Based on data from the 2023 Indonesia Health Survey, the national prevalence of nutritional status (BMI-for-age) among children aged 5-12 years shows 69.4% with normal nutritional status and 11% as underweight, while the prevalence of overweight reaches 19.7%. At the regional level, West Java Province showed a normal nutritional status of 71.8% and underweight status of 9.8%, with an overweight prevalence of 18.4% (2). These data indicate that nutritional issues among school-aged children still require attention. One factor influencing children's nutritional status is the family's socioeconomic condition, particularly income level.

The nutritional status of school-aged children is strongly influenced by the family environment as their closest social setting, particularly in terms of parenting practices and economic status. Parental income levels are a determining factor in a household's ability to access and provide nutritious and varied food for children (3). Data from SKI (2023) show a trend in the relationship between economic status and children's nutritional status: the lowest economic group has the highest prevalence of undernutrition (underweight), reaching 13.5%. Meanwhile, the highest economic group tends to have more nutritional issues, with the highest rates of overweight (14.6%) and obesity (10.8%) compared to other economic groups.

This economic disparity is particularly critical for elementary school-aged children who are in the transition phase from preschool to formal education. During this period, children undergo physical, cognitive, social, and emotional development (4). Elementary school-aged children have passed through the adiposity rebound phase an increase in Body Mass Index (BMI) after age 6, which previously reached its lowest point between ages 2 and 5 (5). This period is characterized by changes in body composition, specifically a faster increase in fat mass compared to muscle mass growth, which continues until the end of elementary school (6). The ages of 10–12 years mark a preparatory stage for puberty, and nutritional status during this period tends to stabilize into adulthood (7). Nutritional requirements during this period increase in preparation for the growth spurt during adolescence (8). Nutritional intake becomes vulnerable because elementary school-aged children begin to have independence in food choices due to broader environmental exposure (9).

Nutritional status is directly determined by nutrient intake and infectious diseases (10). Family income emerges as an indirect factor that significantly impacts children's nutritional status. Parents' income level determines the amount of pocket money, snacking behavior, eating habits, and even the family's physical activity. These conditions indicate that economic status contributes to children's nutritional status (11). Research on the relationship between parental income and children's nutritional status reveals two distinct trends. Research by Wardarita et al., (2021) in Tuah Negeri Subdistrict, Musi Rawas Regency, indicates that children from families with incomes below the minimum wage face a higher risk of malnutrition. This occurs because income limits access to adequate nutrition and influences parents' prior educational levels, which ultimately affects their understanding of selecting healthy food options. Conversely, in the upper-income group, rising income shifts the trend toward an increased risk of overnutrition (12). Research by Amalia et al., (2022) at the elementary school in Sindangrasa Village revealed a significant association between parental income and the prevalence of overweight among children. Higher income increases purchasing power and access to various food types without regard for nutritional quality, particularly in the selection of foods high in sugar and fat in excessive amounts. This situation is also consistent with the high amount of pocket money given to children, which increases their independence to buy unhealthy snacks in the school environment (13). These differing trends indicate that variations in income shape different eating behaviors, which ultimately lead to differing nutritional statuses.

Numerous studies have been conducted on the nutritional status of elementary school children, but analyses of the relationship with family economic status in developing suburban areas such as the Telukjambe Timur subdistrict remain limited. This area has unique characteristics due to its proximity to a university campus, which has led to a rapid proliferation of fast-food outlets around residential neighborhoods. Based on

interviews with the school principal, there is a variety of transportation modes used by students to get to school; these differences indicate variations in family economic backgrounds. Based on this description, the researcher is interested in analyzing the relationship between parental income and the nutritional status of fifth-grade students at SDN Telukjambe II.

2. METHODS

This study is a quantitative study with a cross-sectional design. The research was conducted at SDN Telukjambe II, Karawang, West Java, with data collection taking place from February to April 2025. The research location was selected using convenience sampling based on institutional accessibility. Research subjects were selected using total sampling, which included all fifth-grade students in a single class provided by the school administration, resulting in a total of 31 students participating. Due to administrative policies at the research site, a formal calculation of the sample size was not performed. The relatively small sample size is acknowledged as a limitation in statistical power. Therefore, data analysis will be conducted using appropriate non-parametric tests to ensure statistical validity. The inclusion criteria for this study included fifth-grade students who were present during the study and willing to participate by signing the parental informed consent form and the child's informed assent form. The exclusion criteria were students who were ill and did not fully comply with the study procedures.

This study did not undergo a formal institutional ethics review, but ethical principles were strictly adhered to. Before the study began, an information sheet was distributed along with an informed consent form for parents to sign as the informed and consenting parties, as well as an informed assent form for the children to express their willingness to participate. In addition, all subject data were anonymized to ensure confidentiality. Data collection was conducted using two methods: anthropometric measurements and a questionnaire. Anthropometric measurements included body weight and height to determine nutritional status based on the Age-Adjusted Body Mass Index (BMI-A). Body weight was measured using a digital scale with a precision of 0.1 kg, while height was measured using a microtoise with a precision of 0.1 cm. Parental income data was collected using a closed-ended questionnaire containing 10 questions adapted from Alfiana (2018) (14). This questionnaire consisted of a combination of positive and negative questions, so that the scoring weights (1, 2, or 3) were specifically adjusted for each item. In the validity test of the original instrument on 30 non-responding students, the item validity coefficients ranged from 0.520 to 0.985 using the Product-Moment correlation method. Parental income status was determined by a cumulative total score ranging from 10 to 30. This total score was then divided into three ordinal categories based on equal intervals: low income (scores 10–16), middle income (scores 17–23), and high income (scores 24–30).

Data analysis was performed using Microsoft Excel and SPSS Statistics 25. After the data were collected, data cleaning, coding, and tabulation were conducted. Univariate analysis was performed to determine the characteristics of the subjects, while bivariate analysis used Spearman's rank correlation test to determine the relationship between the independent and dependent variables, since parental income was measured as an ordinal category. The results were considered significantly related if the p-value was < 0.05.

3. RESULTS

Table 1. Characteristics of fifth-grade students at SDN Telukjambe II

Subject characteristic	Frequency	
	n	%
Gender		
Male	14	45,2
Female	17	54,8
Age		
9 years	7	22,6
10 years	24	77,4
Parental Income		
Low	1	3,2
Medium	19	61,3
High	11	35,5
Nutritional Status		
Underweight	2	6,5
Normal	20	64,5
Overweight	4	12,9
Obese	5	16,1

The characteristics of the study subjects at SDN Telukjambe II were dominated by girls, with 17 children (54.8%), while there were 14 boys (45.2%). In terms of age, the majority of the subjects were in the 10-year-old age group, totaling 24 children (77.4%), and the 9-year-old age group, totaling 7 children (22.6%). Based on economic status, the majority of the subjects' parents fell into the medium income category (19 people, 61.3%), the high income category (11 people, 35.5%), and the low income category (1 person, 3.2%). The results of nutritional status measurements (BMI-for-age) showed that the majority of subjects had a normal nutritional status (20 children, 64.5%), followed by the obese group (5 children, 16.1%), the overweight group (4 children, 12.9%), and the underweight group (2 children, 6.5%) (Table 1).

Table 2. Bivariate analysis

Income	Underweight		Normal		Overweight		Obese		Total		r	p-value
	n	%	n	%	n	%	n	%	n	%		
High	0	0,0	5	45,5	2	18,2	4	36,4	11	100,0	0.510	0.003
Medium	1	5,3	15	78,9	2	10,5	1	5,3	19	100,0		
Low	1	100,0	0	0,0	0	0,0	0	0,0	1	100,0		
Total	2	6,5	20	64,5	4	12,9	5	16,1	31	100,0		

4. DISCUSSION

Bivariate analysis using Spearman's rank correlation test revealed a significant association between parental income and the nutritional status of fifth-grade students at SDN Telukjambe II (p-value = 0.003; r < 0.510). The positive correlation coefficient indicates that higher parental income is significantly and strongly associated with an increase in age-adjusted BMI toward the overweight or obese categories. This aligns

with the nutritional status distribution data at the study site, which shows that the majority of subjects fall into the middle- to high-income groups (96.8%), while the prevalence of overweight and obesity reaches 29.0% (Table 1).

The results of this study are consistent with a study conducted by Yasirah et al., (2024) on children aged 7-18 years at SDN 060838 in Medan, which showed that parental income is associated with students' nutritional status (p=0.046). In that study, the majority of family incomes fell into the high category (>Rp3,500,000), and most students tended to have a better nutritional status. The researchers explained that higher income increases household purchasing power (15). A similar pattern was found at SDN Telukjambe II, where the prevalence of moderate to high incomes expanded family purchasing power, which indirectly contributed to an increase in children's BMI-for-age.

Different results were found by Yuliana et al., (2022) among 10-year-old children at SDN 53 Parit, indicating no significant association between parental income and children's nutritional status (p=0.482). The absence of this association was due to the fact that parental income was homogeneously concentrated in the low category (<Rp3,500,000), yet children were still provided with sufficient pocket money (>Rp5,000). The researchers explained that this practice led to uniform snacking patterns among students at school, regardless of their parents' economic background (16). This difference in results occurred because at SDN Telukjambe II, parental income varied, with the majority falling into the moderate to high categories. It is this difference in the distribution of income categories that explains why the parental income variable has a significant relationship with students' nutritional status.

In theory, income level is related to a family's ability to purchase and select a variety of high-quality food in sufficient quantities for daily consumption (17). Income level also contributes to the improved health of every family member through easier access to healthcare facilities. This explains why children from high and middle income families tend to have normal to above-normal nutritional status, in contrast to children from low-income families who are at risk of malnutrition (18).

Fifth-grade students (ages 10-12) are an age group that is beginning to make independent food choices, so their eating patterns no longer fully reflect their parents' habits (19). Family income directly influences the amount spent on food and other household needs (20), including determining the amount of allowance given to children (21). The availability of an allowance provides children with greater freedom to use it during this phase of independence in food selection (22). Additionally, income levels influence the availability of daily transportation options, which contribute to daily physical activity (23). These contributing factors interact with one another in determining children's nutritional status. Nevertheless, family income is actually just one of many other indirect factors that, in reality, can interact with other non-economic factors, such as parents' level of nutritional knowledge. Parents with high incomes but lacking good nutritional knowledge will steer their children toward unhealthy eating patterns, such as consuming convenient instant or high-sugar foods (24). Conversely, parents with low incomes but good nutritional knowledge can select high-quality food items at affordable prices (25).

This study has several methodological limitations that should be noted. First, the sample size in this study is relatively small (N=31), which limits the statistical generalizability of the results. Second, this study was conducted at only one school,

namely SDN Telukjambe II, so the characteristics of the area and the subjects cannot yet reflect the conditions of the elementary school student population at large. Finally, the variables analyzed in this study are still limited to parental economic indicators and do not measure direct factors such as students' dietary intake and physical activity levels.

5. CONCLUSION

Based on the results of the data analysis and discussion in this study, it can be concluded that there is a significant relationship, with a fairly strong correlation and a positive direction, between parental income and the nutritional status (BMI-for-age) of fifth-grade students at SDN Telukjambe II (p-value = 0.003; r = 0.510). Higher parental income is significantly associated with an increase in children's BMI-for-age, leading to the overnutrition or obesity categories. The researchers recommend that parents with higher incomes monitor their children's use of allowance and encourage them to bring packed lunches, while schools should supervise the school cafeteria. Future researchers may include variables directly related to income, such as the amount of allowance children receive, parents' nutritional knowledge, and students' physical activity levels. Future research could also be developed in the form of a school nutrition education program to observe changes in students' snacking habits across different socioeconomic levels.

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