

A study of how family characteristics influence primary school students' nutritional knowledge, attitude, and practice

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Abstract. This study explores the relationship between family characteristics and the nutritional KAP (knowledge, attitudes, and practices) of students, as well as the correlation between students' nutritional KAP and their nutritional status. Conducted as a cross-sectional study between September 2022 and January 2023, the research involved 146 primary school students aged 8-12 years and their parents from eight primary schools in Bogor City. The collected data included anthropometric measurements, nutritional KAP assessments, and socio-economic characteristics of the students' families. Most participants exhibited normal nutritional status, sufficient knowledge, good attitudes, and sufficient practice. A significant correlation was found between the mother's education level and both students' nutritional knowledge ($p = 0.027$, $r = 0.183$) and attitudes ($p = 0.008$, $r = 0.220$). Additionally, a significant negative association was observed between family size and students' nutritional practices ($p = 0.036$, $r = -0.174$), while parental attitudes showed a significant relationship with students' nutritional attitudes ($p = 0.016$, $r = 0.199$). Among family-related factors, the mother's education level was the only variable significantly linked to students' nutritional knowledge and attitudes. However, no significant correlation was found between students' nutritional KAP and their overall nutritional status.

1 Introduction

Nutrition plays a vital role in shaping the health, growth, and development of primary school children. At this stage, children experience rapid physical and cognitive growth, necessitating adequate nutritional intake to support their overall development [1]. According to Indonesia's

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Basic Health Research in 2018 [2], 9.2% of children aged 5-12 years were classified as underweight, with 2.4% categorized as severely underweight and 6.8% as underweight. Additionally, the prevalence of overweight and obesity among school-aged children in Indonesia remains a significant concern, reaching 19.8%, with 10.6% classified as overweight and 9.2% as obese. Several factors, including nutritional knowledge, lifestyle, genetics, physical activity, fitness levels, and dietary habits, can influence a child's nutritional status [3]. Research by Berhanu et al. (2023) highlighted multiple determinants of children's nutritional status, such as age, family size, maternal education, access to drinking water, meal frequency, dietary diversity, and household food security [4].

Among these, the family serves as the primary environment shaping a child's overall development. Parents play a key role in influencing their children's growth by creating a home food environment, shaping their perceptions of food, and establishing dietary preferences and eating patterns [5]. To ensure balanced nutrition, parents must possess adequate nutritional knowledge to provide well-balanced meals [6].

Green's theory suggests that behavior is influenced by predisposing factors such as knowledge and attitudes. While sufficient knowledge is positively associated with better nutritional status, having the intention to adopt healthy eating habits does not always lead to actual behavioral change. Achieving sustainable improvements in nutrition and health requires a combination of knowledge, positive attitudes, proper practices, and self-efficacy.

2 Materials and methods

2.1 Subjects

This study involved 146 primary school students aged 8-12 years, along with their parents, from eight elementary schools in Bogor City. The inclusion criteria required participants to be in either the third or fifth grade, representing lower and upper grade levels, respectively. Additionally, students had to be living with their parents or mothers and express willingness to participate by signing an informed assent, while their parents provided written informed consent. The study was conducted between September 2022 and January 2023. Ethical approval for this research was granted by the Research Ethics Commission for Human Subjects at Bogor Agricultural University, under ethical review number 777/IT3.KEPMSM-IPB/SK/2022.

2.2 Design

This cross-sectional study was carried out in eight primary schools in Bogor City, involving both students and their parents. The research sites were chosen based on recommendations from the Bogor City Education Office, ensuring a balanced selection of schools with four holding A accreditation and four with B accreditation.

2.3 Procedure

Primary data were collected through direct measurements, interviews, and questionnaire administration. Anthropometric measurements, including height and weight, were taken to assess students' nutritional status. The body mass index (BMI) was calculated based on age, and the corresponding z-score was determined to classify students into five nutritional status categories: underweight, healthy weight, overweight, obesity, and severe obesity [7].

Interviews were conducted with both students and parents to gather information on family socio-economic characteristics. The collected data included parental age, family size,

parents' educational background, parents' occupations, and household income. Additionally, students' allowance was recorded during the interview.

Nutritional knowledge, attitudes, and practices (KAP) data were obtained through questionnaires completed by both students and parents. Students answered a total of 60 questions, with 20 questions for each category—nutrition, balanced nutrition, personal hygiene, and clean and healthy living habits. Similarly, parents responded to 15 questions, with five questions assigned to each category. Correct answers were assigned a score of 1, while incorrect answers received a score of 0. The total correct responses were divided by the total number of questions to calculate an individual score for each indicator. Nutritional KAP scores were then classified into three categories: poor (<60), adequate (60-80), and good (>80) [8].

3 Results and discussion

Table 1 presents the demographic characteristics of the study participants, consisting of primary school students aged 8-12 years. The sample included 52.7% upper-grade students (5th grade) and 47.2% lower-grade students (3rd grade). The gender distribution was balanced, with an equal proportion of boys and girls (50% each). Additionally, 53.4% of the students were from A-accredited schools, while 46.6% attended B-accredited schools. Other student characteristics observed included nutritional status and daily allowance. The findings indicated that 17.1% of the students were underweight, while 10.3% were categorized as overweight, and 9.6% were classified as obese. All students reported bringing pocket money to school, with the majority (70.5%) receiving between 5,000 and 10,000 rupiahs per day.

Table 1. Subject characteristics

Indicator	n	Percentage (%)
Age (Year)		
Average±SD	9.9±1.08	
Class		
Higher class	77	52.7
Lower class	69	47.3
Gender		
Boys	73	50.0
Girls	73	50.0
School Accreditation		
A Accreditations	78	53.4
B Accreditations	68	46.6
Nutritional Status		
Underweight	25	17.1
Healthy weight	92	63.0
Overweight	15	10.3
Obesity	14	9.6
Pockey Money		
<Rp5.000,-	21	14.4
Rp5.000-10.000,-	10.3	70.5
>Rp10.000,-	22	15.1

The family, as the primary social environment for a child, plays a vital role in shaping an individual's character. The findings of this study indicate that more than half of the fathers and mothers had received at least 12 years of education, with the majority holding a Diploma 3 as their highest educational qualification (Table 2). Regarding family income, most

households primarily depended on the father's earnings, with most fathers (62.3%) working in the labor sector.

Table 2. Socioeconomics characteristics of the family

Indicator	n	Percentage (%)
Age (Year)		
Average±SD	39.15±6.1	
Status in Family		
Father	135	92.5
Mother	11	7.5
Family Size		
≤4 members	95	65.1
5-6 members	41	28.1
≥7 members	10	6.8
Father's Educational Level		
Elementary School	1	0.7
Junior High School	23	15.8
Senior High School	30	20.5
3-years- Diploma	88	60.3
Bachelor Degre	2	1.4
Post Graduate	2	1.4
Mother's Educational Level		
Elementary School	1	0.7
Junior High School	24	16.4
Senior High School	43	29.5
3-years- Diploma	70	47.9
Bachelor Degre	3	2.1
Post Graduate	5	3.4
Father's Occupation		
Unemployed	3	2.1
Private Officer	24	16.4
Local government officer	2	1.4
Trader	15	10.3
Labor	91	62.3
Others	11	7.5
Mother's Occupation		
Unemployed	124	84.9
Private Officer	4	2.7
Local government officer	2	1.4
Trader	11	7.5
Labor	1	0.7
Others	4	2.7
Father's Income		
No Income	1	0.7
<Rp2,000,000	83	56.8
Rp2,000,000-4,000,000	48	32.9
Rp4,000,000-6,000,000	12	8.2
>Rp6,000,000	2	1.4
Mother's Income		
No Income	41	28.1
<Rp2,000,000	98	67.1
Rp2,000,000-4,000,000	3	2.1
Rp4,000,000-6,000,000	3	2.1
>Rp6,000,000	1	0.7

Table 3 presents the levels of knowledge, attitudes, and nutritional practices among subjects and their parents. Most students (63%) possess sufficient nutritional knowledge. Similarly, 58.2% demonstrate sufficient nutritional practices, while 61% exhibit a good nutritional attitude. Among parents, 65.1% have sufficient nutritional knowledge, aligning with the students' results. Additionally, both parental attitudes and nutritional practices are categorized as good, with percentages of 58.9% and 52.7%, respectively.

Table 3. The nutritional knowledge, attitude, and practice of Subjects and parents

Indicator	Subjects (Students)		Parents	
	n	%	n	%
Nutritional Knowledge				
Less (< 60)	27	18.5	17	11.6
Sufficient (60-80)	92	63.0	95	65.1
Good (> 90)	27	18.5	34	23.3
Nutritional Attitude				
Less (< 60)	10	6.8	0	0
Sufficient (60-80)	47	32.2	60	41.1
Good (> 90)	89	61.0	86	58.9
Nutritional Practice				
Less (< 60)	16	11.0	2	1.4
Sufficient (60-80)	85	58.2	67	45.9
Good (> 90%)	45	30,8	77	52,7

Table 4 displays the correlation test results between family characteristics and students' nutritional knowledge, attitudes, and practices. A significant negative correlation was found between family size and the subjects' nutritional practices ($p=0.036$, $r=-0.174$), indicating that a larger family size is associated with poorer nutritional practices among students. The number of family members influences the ability to meet nutritional needs, as it affects food consumption. Additionally, families with limited financial resources face constraints not only in food expenditure but also in accommodating the diverse food preferences of each member, which may negatively impact students' nutritional practices [9].

Maternal education is positively associated with children's nutritional knowledge and attitudes ($p=0.027$, $r=0.183$; $p=0.008$, $r=0.220$). This relationship is further reinforced by a positive correlation between parents' and children's nutritional attitudes ($p=0.016$, $r=0.199$). Mothers with higher education levels tend to have better health perspectives and attitudes. They are also more likely to adopt long-term healthy lifestyle habits, which contribute to their children's awareness and understanding of diet and physical activity (9,10). According to Kean et al., from a psychological perspective, parental education indirectly supports children's success by shaping parental beliefs and expectations [9]. Consistent with this study's findings, maternal education is linked to children's nutritional knowledge and attitudes. Parents with higher education levels generally possess better nutritional and health knowledge. With adequate information, mothers can actively enhance their children's nutritional awareness, promoting optimal growth and development [11].

The students' nutritional practices are not related to maternal education ($p=0.522$, $r=0.053$). It is suspected that the school environment such as peer groups and teachers play a role in shaping students' character, which influences their decision-making and thus affects their health and well-being [12]. Table 4 also shows that family size is associated with the students' nutritional practices ($p=0.036$, $r=-0.174$), where the larger the family size is associated with the poorer the nutritional practices. This is consistent with research indicating that students from larger families tend to skip breakfast more often, leading to poorer diet quality and a higher risk of obesity [13].

Table 4. Correlations of family characteristics and students' KAP

Indicator	Nutritional Knowledge		Nutritional attitude		Nutritional practice	
	r	p-value	r	p-value	r	p-value
Family Size	0.069	0.408	0.161	0.052	-0.174	0.036*
Parental Age	0.001	0.995	0.144	0.082	-0.049	0.559
Paternal Education	0.059	0.476	0.128	0.123	0.088	0.291
Maternal Education	0.183	0.027*	0.220	0.008*	0.053	0.522
Paternal Occupation	0.006	0.938	0.074	0.376	0.055	0.511
Maternal Occupation	0.085	0.310	0.051	0.537	0.037	0.660
Paternal Income	0.03	0.968	-0.039	0.643	0.006	0.942
Maternal Income	0.006	0.938	-0.037	0.656	0.075	0.370
Parental Knowledge	-0.045	0.589	-0.006	0.945	0.069	0.410
Parental Attitude	-0.006	0.946	0.199	0.016*	0.020	0.811
Parental Practice	-0.028	0.740	0.013	0.879	0.047	0.573

Significant: $p < 0,05$; Pearson Correlation

Table 5 presents the correlation between nutritional knowledge, attitude, and practice of the students with the nutritional status. There was no significant correlation between students' knowledge ($p=0.690$, $r = -0.033$), attitude ($p=0.542$, $r = -0.051$), and practice ($p=0.533$, $r = 0.052$) with students' nutritional status. Child nutritional status is influenced by many factors, including food availability, diet quality, knowledge and attitudes about balance nutrition, child health status, socio-economic factors, and environmental factors. In this case, knowledge, attitudes, and practices are factors that indirectly influence the child's nutritional status [14].

Table 5 illustrates the correlation between students' nutritional knowledge, attitudes, and practices with their nutritional status. The results indicate no significant correlation between students' knowledge ($p=0.690$, $r=-0.033$), attitudes ($p=0.542$, $r=-0.051$), or practices ($p=0.533$, $r=0.052$) and their nutritional status. Children's nutritional status is influenced by various factors, including food availability, diet quality, awareness of balanced nutrition, overall health, socio-economic conditions, and environmental influences. In this context, knowledge, attitudes, and practices serve as indirect factors affecting a child's nutritional status [14].

Table 5. Correlation between students' knowledge, attitude, and practice with students' nutritional status.

Indicator	Nutritional Status	
	r	p-value
Knowledge	-0.033	0.690
Attitude	-0.051	0.542
Practice	0.052	0.533

Significant: $p < 0,05$; Pearson Correlation

4 Conclusion

This study found that most subjects had sufficient levels of nutritional knowledge and practice, while their nutritional attitudes were categorized as good. The only variable significantly associated with students' nutritional knowledge and attitudes was the mother's education level. Meanwhile, students' nutritional practices showed a significant correlation with family size. However, no significant correlation was observed between students' knowledge, attitudes, and practices and their nutritional status.

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