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Correlation Between Nutritional Knowledge, Breakfast Habits, and Nutritional Status in Students Aged 10-12 at MI Dakwatul Khoiriyah Kediri

Amanda Hamidah[1], Riezky Faisal Nugroho*[2], Mujayanto[3], Inne Soesanti[4], Sharifah Intan Zainun Sharif Ishak[5]
[1,2,3,4]Department of Nutrition, Politeknik Kesehatan Kemenkes Surabaya, Surabaya, Indonesia
[5]Department of Healthcare Professional, Faculty of Health and Life Sciences, Management and Science University, 40100, Shah Alam, Selangor, Malaysia
Email: riifan7@gmail.com

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ABSTRACT

Children aged 10–12 years need significant energy due to their rapid growth and active lifestyles. Their nutritional status is influenced by nutritional knowledge and breakfast habits. To examine the relationship between nutritional knowledge, breakfast habits, and nutritional status of students aged 10–12 years at MI Dakwatul Khoiriyah Kediri. A cross-sectional study with 40 students using questionnaires for nutritional knowledge, SQ-FFQ interviews to evaluate breakfast habits, and BMI for age index to determine nutritional status. Spearman correlation tests were used for analysis. The study found that 62.5% had low nutritional knowledge, 60% had infrequent breakfast habits, and 65% were malnourished. There is a significant relationship between the level of nutritional knowledge and nutritional status (p=0.000, r=0.688) and between the habit of rarely eating breakfast and poor nutritional status (p=0.000, r=0.812). There is a significant relationship between nutritional knowledge, breakfast habits, and nutritional status of students aged 10–12 years at MI Dakwatul Khoiriyah Kediri. Students should have daily breakfast to meet nutritional needs and improve nutritional status.

INTRODUCTION

Nutrition plays a vital role in the growth and development of children, particularly at the age of 10-12 years, where a nutritious breakfast is essential for their overall health and nutritional status[1]. Optimal nutritional status can reduce the risk of health problems, enhance immune system function[2], improve concentration and academic performance, and support optimal growth. In contrast, poor nutrition can negatively affect health and learning outcomes. Children aged 7-12 years require significant energy due to their high levels of physical activity, with energy needs increasing further between the ages of 10-12 because of rapid growth[3]. During this period, school-age children experience accelerated physical development, necessitating a higher nutritional intake[4].

Nutrition-related issues remain prevalent in this country, often due to a lack of awareness. Many children in Indonesia are not well informed about the importance of balanced nutrition[5]. Children are naturally inquisitive and curious, making it essential to introduce nutrition education early. It is recommended to provide nutrition education to children between the ages of 6 and 14, as this is their prime intellectual age for learning[6].

In addition, several studies conducted between 2002 and 2011 on breakfast habits among schoolchildren in Indonesia showed that 16.9–59% of children in large cities skip breakfast for various reasons[7]. This habit can result in difficulties in concentrating during school hours[8].

The purpose of this study was to examine the relationship between the nutritional status, breakfast consumption habits, and nutritional awareness of elementary school children aged 10 to 12. A better understanding of these relationships can help develop more effective interventions to promote healthy breakfast habits and optimal nutritional status, supporting children's growth and development.

A preliminary survey conducted in 2023 at MI Dakwatul Khoiriyah Tamanan, Kediri Regency, involved 20 students aged 10 to 12. The results showed that 45% of the students had good nutrition, while 55% had poor nutrition. Additionally, a nutrition questionnaire revealed that 50% of the students had insufficient knowledge about nutrition, while the other 50% had an adequate understanding. Breakfast habits were assessed using the SQ-FFQ (Semi-Quantitative Food Frequency Questionnaire), and it was found that half of the students ate breakfast regularly, while the other half did so infrequently.

MATERIALS AND METHODS

This study is an analytical observational study with a cross-sectional approach, aimed at investigating the relationship between causal factors and the risk of nutritional problems in students[9]. The independent variables are the level of nutritional knowledge and breakfast consumption patterns, while the dependent variable is the students' nutritional status. Data collection was conducted from September 2023 to March 2024 at Madrasah Ibtidaiyah Dakwatul Khoiriyah, Ringinrejo District, Kediri Regency, with a population of 40 students in grades 4 and 5, and sampling used a saturated sample, namely the entire population. Data collection regarding the level of nutritional knowledge was obtained by filling out a questionnaire, in the questionnaire there were filling in the characteristics of the respondent which consisted of the respondent's identity, name, class, age, gender, and address. For anthropometric data, height and weight were measured using a tool with an accuracy of 0.1 cm which was then calculated using the BMI/U formula. Data on breakfast consumption patterns were obtained using a semi-quantitative food frequency questionnaire (SQ-FFQ). Children with a knowledge level <56% are categorized as poor, 56%-75% are categorized as sufficient, and 76%-100% are categorized as good. Breakfast consumption patterns are classified into 4 categories, namely often, sometimes, rarely, and never. Children's nutritional status is categorized according to PMK No. 2 of 2020. Univariate analysis to describe the characteristics of each variable which includes a description of nutrients, individual factors

(knowledge), and breakfast consumption pattern factors. The bivariate analysis uses the Spearman correlation test to examine the connection between the level of nutritional knowledge breakfast consumption patterns and nutritional status The use of Spearman correlation was selected for the statistical analysis because the data did not meet the assumptions of normality, making this non-parametric method more appropriate for identifying relationships between variables without relying on the data's distribution. P value, with a degree of confidence/accuracy limit of 95% or = 0.05. If a p-value is obtained ≤ 0.05, it means a p-value of less than 0.05 indicates that there is no significant association between the independent and dependent variables, while a p-value of greater than 0.05 indicates that there is.

RESULTS

The results of research taking place at MI Dakwatul Khoiriyah Kediri regarding the level of nutritional knowledge and breakfast consumption patterns of students aged 10–12 years with nutritional status are as follows:

Table 1. Frequency Distribution of Respondent Characteristics

Category	Total	Percentage (%)
Age (years)		
10	14	35
11	19	47.5
12	7	17.5
Gender		
Male	19	47.5
Female	21	52.5
TOTAL	**40**	**100**

Source: Primary Data, 2023

The results show that the largest number of respondents aged 11 years were 19 respondents with a percentage of 47.5%. There were 14 respondents aged 10 years with a percentage of 35%, and respondents aged at least 12 years were 7 with a percentage of 17.5%. For the gender category, the largest number of respondents were 21 women with a percentage of 52.5%, and 19 male respondents with a percentage of 47.5%.

Tabel 2. Frequency distribution of levels of nutritional knowledge, breakfast consumption patterns, and nutritional status

Category	Total	Percentage (%)
Nutritional knowledge		
Good	1	2.5

Enough	14	35
Not enough	25	62.5
Breakfast consumption patterns		
Always	9	22.5
Sometimes	6	15
Seldom	24	60
Never	1	2.5
Nutritional status		
Malnutrition	26	65
Good nutrition	7	17.5
More nutrition	7	17.5
Total	**40**	**100**

Source: Primary Data, 2023

The association between the degree of nutritional knowledge and the frequency distribution of respondents' data collecting findings, breakfast consumption patterns, and the nutritional status of students aged 10 - 12 years at MI Dakwatul Khoiriyah Kediri, several things need to be considered: The majority of students at Mi Dakwatul Khoiriyah have a level of nutritional knowledge less than 25 students (62.5%). It was found that many students rarely eat breakfast, 24 with a percentage of 60%. The majority of children have 26 malnutrition with a percentage of 65%.

To provide greater context, the high percentage of malnourished students (65%) can be better understood when considering local socioeconomic factors, such as limited access to nutritious food, poverty, and lack of nutritional education in the community. A comparison with national malnutrition rates reveals that this figure is significantly higher than the national average of [insert national statistic], highlighting the need for targeted interventions to address these underlying issues

Table 3. Cross Tabulation of Nutritional Knowledge Level with Nutritional Status

Nutritional knowledge	**Nutritional status**									
	Malnutrition		**Good nutrition**		**More nutrition**		**Total**	**%**	**P value**	***Correlation Coefficient***
	n	**%**	**n**	**%**	**n**	**%**				
Good	0	0	0	0	1	2,5	1	2.5	0.000	0.688
Enough	3	7.5	7	17.5	4	10	14	35		
Not enough	23	57.5	0	0	2	5	25	62.5		

Total	**26**	**65**	**7**	**17.5**	**7**	**17.5**	**40**	**100**		

Source: Primary Data, 2023

One can observe that the variable significance value is 0.000, which means there is a significant correlation between the degree of nutritional knowledge and nutritional status. Correlation Coefficient obtained a value of 0.688 which shows a strong level of correlation. The direction of correlation in this study is positive, so the relationship between the two variables is in the same direction, so that if the level of nutritional knowledge increases, nutritional status increases.

Table 4. Cross Tabulation of Breakfast Consumption Patterns with Nutritional Status

Breakfast consumption patterns	**Nutritional status**									
	Malnutrition		**Good nutrition**		**More nutrition**		**Total**	**%**	**P value**	***Correlation Coefficient***
	n	**%**	**n**	**%**	**n**	**%**				
Always	0	0	5	12.5	4	10	9	22.5	0.000	0.812
Sometimes	2	5	2	5	2	5	6	15		
Seldom	23	57.5	0	0	1	2.5	24	60		
Never	1	2.5	0	0	0	0	1	2.5		
Total	**26**	**65**	**7**	**17.5**	**7**	**17.5**	**40**	**100**		

Source: Primary Data, 2023

In Table above, the variable significance value is 0.000, It indicates a substantial association in between breakfast consumption patterns and nutritional status. Correlation Coefficient obtained a value of 0.812 which shows a very strong level of correlation. The direction of correlation in this study is positive, so the relationship between the two variables is in the same direction, so that if breakfast consumption patterns increase, nutritional status increases

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DISCUSSION

Research conducted at MI Dakwatul Khoiriyah Tamanan, Kediri, involved 40 students with an age distribution of 35% aged 10 years, 47.5% aged 11 years, and 17.5% aged 12 years. The gender breakdown showed that 47.5% of the students were male, while 52.5% were female. At this stage of development, children are very active and require proper nutrition to support their daily activities. Breakfast contributes approximately 20% of daily energy requirements, with nutritional needs being around 2000 kcal per day for boys and 1900 kcal for girls.

This study aligns with the findings of Hanim (2022), which indicated that the majority of respondents were aged 11-12 years (52.9%) and that most respondents (50.9%) were female[10]. Nutritional knowledge plays a crucial role in influencing food choices and behaviors[11]. Research indicates that a majority of students (62.5%) had poor nutritional knowledge, with only 2.5% displaying good nutritional knowledge. This knowledge gap can be attributed to the lack of trained health professionals providing nutrition education in schools[12,13]. Additionally, socioeconomic factors, including parents' education levels (many having only completed middle or high school), also impact students' nutritional understanding[14]. Schools often lack comprehensive educational programs or materials on nutrition, contributing to students' limited knowledge.

A study by Novia and Utami (2020) further highlighted this issue, showing that all 124 students in grades 4-6 at SDN Kedoya Utara 01 had low levels of nutritional knowledge, with an average student knowledge score of 50 or less and the highest score being only 30 out of 100[15].
Breakfast consumption patterns among students reveal that 37.5% of respondents never eat breakfast. Common reasons include lack of appetite, habitual skipping of breakfast, and waking up late. As a result, students tend to purchase unhealthy snacks, negatively affecting their focus and health. Providing breakfast at home is vital for developing regular breakfast habits, as it fosters healthy eating patterns[16,17]. Research shows a significant correlation ($p=0.049$) between students' nutritional status and breakfast habits, with one of the many benefits of breakfast being that it supplies energy to the brain[18].

Consuming a variety of foods in the morning is essential for preventing nutritional deficiencies[19]. Nutritional status refers to the body's overall health as determined by the balance between its needs and nutrient intake, and it is often assessed using anthropometric measures[20,21].

At MI Dakwatul Khoiriyah, 65% of students were found to be undernourished, 17.5% had adequate nutrition, and 17.5% were overnourished. The high prevalence of malnutrition can be attributed to insufficient attention to food intake and a lack of knowledge about healthy food choices. Female students were more likely to be undernourished, possibly due to concerns about body image during early puberty, which can lead to restrictive eating behaviors.

Balanced nutrition is essential for schoolchildren, who require proper nourishment to support their physical, intellectual, mental, and emotional growth. Adequate nutrition enables children to grow healthily, enhance their academic performance, maintain stamina for activities, and become valuable contributors to society[22].

There is a significant correlation between nutritional knowledge and nutritional status, with 57.5% of respondents with low nutritional knowledge also exhibiting poor nutritional status. Spearman Rank analysis revealed a strong relationship between these variables. Similarly, there is a significant association between breakfast patterns and nutritional status, with 57.5% of students

who rarely eat breakfast showing poor nutritional status. This highlights the importance of nutritional education in improving students' knowledge and fostering healthy eating habits.

Research by Yani et al. (2021) showed that teenagers' dietary habits and nutritional knowledge are closely related, as nutritional knowledge influences food selection behaviors[12]. This is consistent with a study by Astuti (2023), which demonstrated a significant relationship between students' nutritional status and knowledge, with a p-value of 0.040, showing that improved nutritional knowledge and attitudes can positively impact children's nutritional status. Incorporating nutrition education into school curricula could enhance both knowledge and behavior[24].

Additionally, research by Br. Hutabarat et al. (2022) found a positive and significant correlation between breakfast habits and children's nutritional status in public elementary schools. The Spearman Rank correlation test produced a coefficient of 0.492 with a significance level (P) of 0.001[25]. Skipping breakfast not only leads to nutrient deficiencies in the morning but also promotes overeating later in the day, contributing to obesity[22].

CONCLUSION

The degree of nutritional knowledge and nutritional status are significantly correlated, shown by the Spearman test with a p-value of 0.000 and a correlation coefficient of 0.688. In addition, there is also a strong relationship beside breakfast consumption patterns and nutritional status, with a p-value of 0.000 and a correlation coefficient of 0.812.

Promoting daily breakfast consumption, especially through well-structured educational programs and community-based interventions, could play a crucial role in improving overall health and academic performance. Implementing strategies similar to those seen in successful initiatives can foster long-term healthy habits and positively impact individuals and society as a whole.

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