



IS THERE A RELATIONSHIP BETWEEN KNOWLEDGE, ATTITUDES, AND EATING BEHAVIOR AMONG ADOLESCENTS IN EDUCATION?

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ABSTRACT

This research aims to see how adolescents' knowledge and attitudes about balanced nutrition are related to their eating behavior. Adolescents are the age group most vulnerable to changes in unhealthy eating habits, which can have a major impact on important aspects of their health. This research involved 160 junior high school students aged 12 to 17 years.

Guidelines for knowledge of balanced nutrition (PUGS) as well as eating attitudes and behaviors are the topics of the Nutritional Literacy Survey. Based on the investigation, it is known that 66.9% are in the middle adolescence group (aged 14–17 years). Most respondents had moderate nutritional knowledge with a percentage of 69.4%, a negative attitude percentage of 55.6%, and eating behavior was also in the moderate category at 65.6%. The results of research using bivariate analysis show that the relationship between knowledge and adolescent eating behavior has a p -value of 0.114 ($p > 0.05$) and the relationship between attitude and adolescent eating behavior has a p -value of 0.108 ($p > 0.05$), so it can be concluded that there is no relationship between knowledge and attitudes towards the balanced nutritional eating behavior of adolescents. The significance of this research lies in the importance of integrating nutrition education into school programs and curricula to increase nutrition knowledge in adolescents, such as nutrition with science, technology, engineering, and mathematics (STEM). Additionally, educational programs that focus on sustainable development and health awareness may be effective in encouraging healthy eating habits in this age group.

Keywords: *nutrition, eating behavior, adolescents, sustainability*

1. INTRODUCTION

Adolescents aged 10–19 years are an important transition period from childhood to adulthood that experiences significant changes due to hormonal maturation and body composition. Adequate nutrition is essential for growth, development, health, well-being, and preventing obesity and chronic disease. Adolescents tend to consume foods rich in carbohydrates and fats between meals, which can trigger nutritional problems. The World Health Organisation (WHO) emphasizes the importance of adequate nutrition for children and adolescents to contribute to transformative change and sustainable development. The eating behavior and food choices of adolescents play an important role in their nutritional needs. Therefore, promoting good nutrition is essential for their overall well-being and their participation in sustainable development (Al-Jawaldeh et al., 2020; Almoraie et al., 2021; Lestari et al., 2022; Surijadi et al., 2021).

Adolescence can cause nutritional problems such as malnutrition, overweight, and obesity, which have increased significantly globally since 1980. Based on 2018 Riskesdas statistics, 25.7% of adolescents in Indonesia aged 13 to 15 years and 26.9% of Adolescents aged 16 to 18 years have a short or very short nutritional status. Additionally, 8.7% of adolescents between 13 and 15 years old and 8.1% of adolescents between 16 and 18 years old are considered thin or very thin. Meanwhile, 16.0% of adolescents aged 13 to 15 years and 13.5% of adolescents aged 16 to 18 years were reported to be overweight or obese (Kemenkes, 2020). This can be caused by an unbalanced diet. Lack of nutritional knowledge among Adolescents, including intelligence in choosing nutrient-rich foods, can influence a person's intake, and the higher the knowledge, the more attention will be paid to food consumption both in terms of quality and type. Attitude also plays an important role in adolescent behavior when choosing food. A positive attitude towards health may not have a direct impact on positive behavior, but a negative attitude can have a direct impact on the behavior of eating balanced nutrition (Muthmainah et al., 2019; Ramadhani et al., 2022; Rosati et al., 2013). Schools are crucial for creating a nurturing learning environment that fosters healthy, educated, and engaged citizens. They promote sustainable eating patterns, encouraging traditional, locally grown foods, which boosts the local economy. A well-nourished,



healthy, and educated population is essential for economic growth. Investing in a whole-school nutrition approach improves students' education, health, and well-being, as well as the economic prospects of individuals, communities, and countries. (World Health Organization (WHO), 2023).

Based on the introduction above, researchers are interested in studying the relationship between knowledge, attitudes and eating behavior of balanced nutrition among students in education.

2. METHODS

This research uses quantitative descriptive research with a cross-sectional design. In October 2023, research was conducted at 3 junior high schools in Bandung. In this study, eating behavior is the dependent variable, whereas adolescents' attitudes and knowledge about nutrition are the independent factors. This research involved all students in grades VII, VIII, and IX as the target population. The Slovin formula was then used to calculate the sample size, namely a minimum of 92 students. While in the field, researchers received questionnaire answers from 160 respondents for further research. This research uses data on the characteristics, knowledge, attitudes, and behavior of respondents in implementing the General Balanced Nutrition Programme (PUGS) and environmental factors such as parental education, the influence of friends and teachers, and exposure to PUGS media.

The instrument used was a questionnaire adapted from the General Guidelines for Balanced Nutrition Research by Novitasari (2009). The categorisation of knowledge and behavior variables is based on standard percentages, with a Less score of <50 , a moderate score of $50-75$, and a high score of >75 , while the attitude category is determined by the standard mean, namely that a score $<$ mean is in the negative category and \geq mean is in the positive category. The data were analyzed univariate and bivariate. Bivariate analysis uses the Chi square statistical test to see the relationship between knowledge and attitudes and students' balanced nutritional eating behavior. Next, the data is presented in the form of tables and narratives.

3. RESULTS & DISCUSSION

3.1 Respondent Characteristics

Based on the results of research conducted on 160 respondents who were students in grades VII, VIII, and IX in 3 schools in Bandung, it showed that 107 respondents (66.9%) were in the middle adolescence category, while the smallest group was the early adolescence group with 53 respondents (33.1%). In addition, there were 72 (45.0%) male respondents and 88 (55.0%) female respondents, as seen in Table 1. Childhood and adolescence are critical periods in establishing a healthy lifestyle because, during this period, there is an increase in nutritional integrity to meet rapid growth. Some habits, including eating behaviors, adopted during this use may continue throughout life (Sawyer et al., 2018). Adolescents between the ages of 10-19 make up 23% of people in low-income nations and 16% of the global population. Future growth depends on their well-being (UNESCO, 2016).

Table 1. Distribution of Respondent Characteristics

Variable	Number of Samples (83 Students)	
	n	%
Age		
Early adolescence (10 -13 years)	53	33.1
Middle adolescence (14 -17 years)	107	66.9
Gender		
Man	72	45.0
Woman	88	55.0

Source: Primary Data, 2023

3.2 PUGS Knowledge



The research results in Table 2 show that the majority of students have moderate level knowledge, namely 69.4%; 19.4% of respondents have Less knowledge of nutrition; and the remaining 11.3% have high knowledge. This is consistent with studies carried out by Ramadhani et al. (2022) regarding nutritional knowledge among students, which shows that of the 270 respondents studied, 42.6% had Enough nutritional knowledge. The large prevalence rate among respondents could be due to the fact that most students have received exposure to information about nutrition both formally and informally but have not absorbed it optimally. Increasing nutritional knowledge will have an impact on nutritional attitudes and behavior in adolescents as well as adolescents' ability to apply nutritional information in everyday life (Patimah et al., 2016). For the purpose of developing their life and making educated decisions about their health, relationships, and general well-being, students must be aware of nutritional facts. Efforts to realize this nutritional strengthening can be made by linking nutrition with science, technology, engineering and mathematics (STEM) clubs (for example, the kitchen garden as a learning laboratory) (World Health Organization (WHO), 2023).

3.3 PUGS Attitude

Table 2 indicates that there were 89 respondents. (55.6%) have a negative attitude towards PUGS and the rest (44.4%) have a positive attitude towards balanced nutrition, meaning that students' attitudes towards PUGS do not fully pay attention to healthy nutrition. Adolescents need time to process things outside their environment. Human attitudes are not formed from birth but rather through social processes that occur during their lives, where individuals gain information and experience (Ramadhani et al., 2022). By influencing students' attitudes, it will have a positive impact on their lives and have a progressive impact on society at large (Qureshi, 2020).

3.4 PUGS Behaviour

Based on Table 2, there are 65.6% of respondents with balanced nutritional behavior in the moderate category, 17.5% of respondents with balanced nutritional behavior in the high category, and the remaining 16.9% are in the Less category, so the majority of respondents have adequate balanced nutritional behavior. This nutritional awareness can be influenced by a lack of optimal knowledge about nutrition or other environmental factors such as age, education, religion, social, economic, and cultural factors. Eating behavior is a behavior that is closely related to eating and types of food, a person's frequency of eating, eating habits, established eating patterns, taboos, sharing of food within the family, preferences for food, and how to choose food (Suhardjo, 2013).

Table 2. Distribution of Nutrition Knowledge, Attitudes and Behavior

Variable	Number of Samples (83 Students)	
	n	%
Knowledge		
High	18	11.3
Moderate	111	69.4
Less	31	19.4
Attitude		
Positive	71	44.4
Negative	89	55.6
Behavior		
High	28	17.5
Moderate	105	65.6
Less	27	16.9

Source: Primary Data, 2023

3.5 Environmental Factors



Environmental factor variables are divided into five categories: father's education level, mother's education, PUGS media exposure, teacher influence, and friend influence. The results obtained show that the father's education is mostly lower middle school, with a percentage of 89.4%, as is the mother's education, which is lower middle school, with a percentage of 90.6%. To measure exposure to PUGS media, it is divided into two categories: having seen media containing PUGS and never seeing media containing PUGS. From table 3, there were 145 respondents, or 90.6%, who stated that they had seen media containing General Guidelines for Balanced Nutrition (PUGS), and only 9.4% had never seen it, meaning that students already had knowledge about PUGS.

Table 3. Distribution of Environmental Factors

Variable	Number of Samples (83 Students)	
	n	%
Father's Education		
Lower middle (\leq high school)	143	89.4
High (\geq D3)	17	10.6
Mother's Education		
Lower middle (\leq high school)	145	90.6
High (\geq D3)	15	9.4
PUGS Media Exposure		
Once	145	90.6
Never	15	9.4
Teacher Influence		
Strong	85	53.1
Weak	75	46.9
Peer Influence		
Strong	88	55.0
Weak	72	45.0

Source: Primary Data, 2023

Researchers asked further about the type of media that respondents saw, and it was discovered that respondents received messages about PUGS from print, electronic media, and direct messages from parents, teachers, friends, coaches, and health workers. Teachers are the largest source of PUGS media delivery, namely 17.8%, followed by the internet at 16.8%, and parents at 12.8%. From this, it can be seen in Table 4 that the influence of teachers in instilling PUGS in students is quite strong, with a percentage of 53.1%. Teachers should be aware of any health-related issues among the children in their classes. Teachers should also encourage students to do some physical activity every day, including food choices while at school (UNESCO, 2016). Encouraging teachers to eat with students to strengthen healthy eating and hygiene practices while strengthening social relationships is one effort to realize sustainable education through strengthening nutrition (World Health Organization (WHO), 2023). Apart from teachers, friends can also influence food choices. Table 3 indicates that about 88 (55.0%) respondents stated that the influence of friends was strong and the rest were weak. Adolescents tend to easily follow the influence of their peers, so Adolescent attitudes and behaviors about balanced nutrition are predicted to improve with a positive approach, such as peer coaching (Nuryani & Paramata, 2018)

Table 4. PUGS Media Types

Media Type	Number of Samples (83 Students)	
	n	%
Print media:		
Newspaper	9	1.8
Magazine	12	2.4



Book	55	10.9
Brochure	35	6.9
Electronic Media:		
Television	55	10.9
Radio	9	1.8
Internet	85	16.8
Teacher	90	17.8
Friend	22	4.3
Parent	65	12.8
Health workers	56	11.1
Etc	13	2.6
Total	506	100

Source: Primary Data, 2023

3.6 Relationship between knowledge and attitudes and eating behavior based on PUGS

Based on the research data in Table 5, it is known that respondents who have a high level of knowledge have a level of high behavior of 22.2%. Respondents who had a high level of knowledge and a fair level of behavior were 61.1%. Apart from that, it can also be seen that students have a positive attitude category with high, moderate, and Less behavior levels of 23.9%, 63.4%, and 12.7%, respectively. Meanwhile, respondents who had a balanced nutritional attitude were in the Less category, with levels of good, enough, and Less behavior of 12.4%, 67.4%, and 20.2%, respectively. Based on the results of bivariate analysis, the p-values for knowledge and attitudes were 0.114 (>0.05) and 0.108 (>0.05), which means there is no significant relationship between knowledge and students' balanced nutritional behavior, and there is also no significant relationship between attitudes towards students' balanced nutritional behavior.

According to theory, behavior is shaped by internal and external factors that interact with each other, where knowledge is an internal factor. Thus, it can be said that the knowledge factor is not Enough to make a significant contribution to the formation of balanced nutritional behavior in students. External factors can be environmental Age, education, employment, religion, socio-economic, and cultural) as well as other factors (Arief et al., 2020). Apart from the factors explained above, it can also be proven that behavior is not only influenced by knowledge but also by the environment, beliefs, and culture. An environment with quite diverse and different sources of information can have an influence on the way individuals behave (Chen et al., 2020). A person's level of nutritional education affects their attitudes and behaviors while making food choices, which in turn affects how well-nourished they are. A person will have better nutritional status the more knowledgeable they are about nutrition. Though someone may be aware of the amount of nourishment their body needs, their knowledge of nutrition may not always translate into altered eating habits if they fail to incorporate this information into their everyday lives (Medina et al., 2020).

There is no relationship between attitudes and students' balanced nutritional behavior (p -value = 0.108). These results show that there is no synergy between attitudes and behavior, considering that the age range of respondents is 12–17 years. For Adolescents, who are generally still unstable and easily influenced, the knowledge they have cannot simply be applied in everyday life because of the influence of friends, family, and the environment.

Table 5. Relationship Between Knowledge And Attitudes And Eating Behavior With Balanced Nutrition

Variable	Behavior								<i>P value</i>
	High		Moderate		Less		Total		
	n	%	n	%	n	%	N	%	
Knowledge									



High	4	22.2	11	61.1	3	16.7	18	100	0.114
Moderate	21	18.9	76	68.5	14	12.6	111	100	
Less	3	9.7	18	58.1	10	32.3	31	100	
Attitude									
Positive	17	23.9	45	63.4	9	12.7	71	100	0.108
Negative	11	12.4	60	67.4	18	20.2	89	100	

Source: Primary Data, 2023

4. CONCLUSION

Based on the research results above, it can be concluded that the majority of students have nutritional knowledge in the moderate category with a percentage of 69.4%, the percentage of Less attitudes is 55.6%, and nutritional behavior is also in the moderate category at 65.6%. There is no relationship between knowledge and students' balanced nutritional behavior, and there is no relationship between students' nutritional attitudes and behavior. There is a need to integrate nutrition education into school programmes and curricula to increase nutritional knowledge in adolescents, such as by linking nutrition with science, technology, and mathematics (STEM). Additionally, educational programmes that focus on sustainability and health awareness may be effective in encouraging healthy eating habits in this age group.

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