



# The Influence of Nutritional Knowledge and Food Choice Attitudes on the Eating Behavior of Adolescents in Kediri District

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## ABSTRACTS

This study investigates the impact of nutritional knowledge and food choice attitudes on adolescent eating behavior. A total of 77 people aged 12-21 years were surveyed using purposive sampling in Kediri Regency, East Java. The research design was observational with a cross-sectional approach. The results showed that 67.53% of teenagers were female and 32.47% were male. 50.65% of teenagers had good nutritional knowledge, 64.94% had adequate attitudes towards food choice, and 61.04% had adequate eating behavior. The correlation test showed no significant relationship between nutritional knowledge and attitudes towards food choice, while the correlation test showed a significant relationship between nutritional knowledge and adolescent eating behavior and food choice attitudes and eating behavior. A multiple correlation value (R) of 0.005 was obtained, indicating that there is an influence between nutritional knowledge and attitudes towards food choices on eating behavior in adolescents.

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## 1. INTRODUCTION

Food is a basic human need that must be met at all times. Good food is food that has high nutritional value and benefits for the body. To produce food that is beneficial for the body requires good knowledge of the selection of food ingredients and the processing process. Consuming quality food can be realized by paying attention to the nutritional content consumed every day.

Healthy food if it meets a healthy eating pattern, that is, it contains balanced nutrition such as carbohydrates, protein, vitamins and minerals. The implementation of this healthy eating pattern is in accordance with the Indonesian Minister of Health Regulation no. 41 of 2014 concerning guidelines for balanced nutrition which is packaged in the "Fill My Plate" campaign. The contents of my plate is a guide for managing a healthy eating pattern consisting of staple foods, side dishes, vegetables and fruit on one dinner plate with portions adjusted to the body's needs. In the contents of my plate, there is also information about a healthy lifestyle, namely sufficient physical activity, maintaining cleanliness by washing hands after doing activities and consuming enough water (Ministry of Health of the Republic of Indonesia, 2019).

A bad diet can cause multiple nutritional problems. Double nutrition is a problem caused by overnutrition or obesity and undernutrition or underweight. Nutritional sufferers are more susceptible to diseases such as hypertension, heart disease, diabetes and others, while malnourished sufferers are susceptible to anemia, stunting and so on. Fulfillment of balanced nutrition is very necessary in productive age such as adolescence, because at this time adequate nutrition is needed to support the growth process.

Teenagers are a good generation as the nation's successors. Adolescence is a transition period from children to adults. The age range for adolescents starts from the age of 10 years to the age of 19 years or can be called pre-puberty and puberty (Ministry of Health of the Republic of Indonesia, 2014). Adolescent growth and development can be divided into four stages, namely pre-adolescence at the age of 10-12 years, early adolescence at the age of 12-15 years, middle adolescence at the age of 15-18 years and late adolescence at the age of 18-21 years (Tanner & Arnett, 2016). This research was aimed at teenagers aged 12-21 years in Kediri Regency.

Adolescence is a time when physical, cognitive and psychosocial changes occur. This period is a transition period from childhood to adolescence which is marked by many changes including the growth of muscle mass, body fat tissue and hormonal changes (Backes & Bonnie, 2019). These changes can affect a person's nutritional needs (Drummond & Brefere, 2021). At this age, teenagers are responsible and free to choose and determine what they want, including in terms of choosing their own food. Important components that influence healthy food choices are nutritional knowledge and attitudes (Ziegler et al., 2021).

Adolescents' nutritional knowledge greatly influences food choices. Low nutritional knowledge is one of the risk factors for nutritional problems and changes in eating habits during adolescence (Thakur & Mathur, 2022). A teenager will have adequate nutrition if the food they eat is able to provide the nutrients needed by the body (Lassi et al., 2017). Nutritional knowledge includes knowledge related to food and nutrients, sources of nutrients in food, food that is safe to consume so that it does not cause disease and how to process food properly so that the nutrients in food are not lost and how to live healthily (Potter, et al., 2021). Nutritional knowledge will influence the food intake that enters the body, because nutritional knowledge provides information related to nutrition, food and its relationship with health (Spronk et al., 2014). Healthy food choices related to fulfilling balanced nutrition and health are influenced by teenagers' nutritional knowledge (Brown et al., 2021). A teenager's level of nutritional knowledge will influence attitudes and behavior in choosing food, which determines whether it is easy for someone to understand the benefits of the nutritional content of the food they consume (Hamulka, et al., 2018). Modern behavioral changes also influence teenagers' behavior in choosing foods that tend to be high in calories, high in fat and low in fiber (Ruiz et al., 2019). Fulfillment of unbalanced nutrition in adolescents can cause several health problems and changes in nutritional status such as double nutritional

problems, namely overnutrition (overweight or obese) and undernutrition (thin or underweight) (Bund et al., 2017).

2018 Basic Health Research Data shows that the number of obesity in adolescents aged  $\geq 15$  years increased from 26.6% in 2013 to 31% in 2018. The province with the highest prevalence is North Sulawesi, namely 42%. Based on 2018 Riskesdas data in adolescents aged 16-18 years, the prevalence of obesity in 2013 was 7.3 percent (5.7% overweight and 1.6% obese) but increased to 13.5% (9.5% overweight and 4.0% obese). Meanwhile, the prevalence of thinness in 2013 was 9.4 percent (1.9% very thin and 7.5% thin) and in 2018 it decreased to 8.3% (1.4% very thin and 6.7% thin) (UNICEF, 2022).

Changes in eating habits in adolescents are caused by low nutritional knowledge. Adolescents' low nutritional knowledge and practices are reflected in their behavior in choosing the wrong food habits (Mizia et al., 2021). Teenagers have a significant influence on eating habits, where they begin to interact with more environmental influences and experience the formation of behavior, which makes teenagers more active, eat more outside the home and have a lot of influence in choosing the food they will eat, teenagers are also more often motivated trying new foods, one of which is fast food and junk food (Scaglioni, et al., 2018). Teenagers who have good nutritional knowledge will prefer food according to their needs (Thakur & Mathur, 2022).

Based on the background description, the main problem to be studied is the influence of nutritional knowledge and food choice attitudes on adolescent eating behavior in Kediri Regency, East Java. This study aims to identify the influence of nutritional knowledge and food choice attitudes on adolescent eating behavior.

## 2. METHODS

The research design used was observational with a cross sectional approach. The number of samples in this study was 77 people aged 12-21 years in Kediri Regency. Data collection uses a purposive sampling technique or sampling by determining characteristics that suit the research objectives. The research instrument used was an online questionnaire distributed via Google Form, containing questions and statements that had been tested for reliability. The following is a reliability test table.

**Table 1.** Reliability Test Results

Variable	Reliability Coefficient	Criterion Value	Information
Nutrition Knowledge	0.827	0.70	Reliable
Food Choice Attitudes	0.721	0.70	Reliable
Eating Behavior	0.723	0.70	Reliable

The data collected in this research is nutritional knowledge which is calculated based on Body Mass Index (BMI), attitudes in choosing food, eating behavior, age and gender. Hypothesis testing uses the chi square test with a confidence level of 95% to determine whether or not there is an influence between nutritional knowledge and attitudes towards food choices on eating behavior in adolescents (Liu et al., 2021). The data obtained is tabulated in tables according to the type of influencing variable.

### 3. RESULTS AND DISCUSSION

#### 3.1. Respondent Characteristics

The respondents for this research were teenagers aged 12 to 21 years in Kediri Regency with a total of 77 people. The data obtained is tabulated according to the research variables in the form of figures and tables.

##### 3.1.1. Description of Respondent's Gender

Based on the research results, data was obtained regarding the gender of respondents aged 12-21 years. The number of respondents according to gender can be seen in the following table.

**Table 2.** Description of Respondents' Gender

Gender	Frequency	Percentage (%)
Man	25	32.47 %
Woman	52	67.53 %
<b>Amount</b>	<b>77</b>	<b>100 %</b>

Table 2 shows the gender of respondents, it is found that the majority of respondents were women, namely 52 people (67.53%) while the fewest were men, namely 25 people (32.47%).

##### 3.1.2. Age Description of Respondents

Based on the research results, data was obtained regarding the age of respondents aged 12-21 years. You can see the number of respondents according to age in the following table.

**Table 3.** Age Description of Respondents

Age Category	Frequency	Percentage (%)
12 – 15 years old	3	3.90 %
16 – 18 years old	44	57.14 %
19 – 21 years old	30	38.96 %
<b>Amount</b>	<b>77</b>	<b>100 %</b>

Table 3 describes the age of respondents, it was found that the largest age group of respondents was 16-18 years old, namely 44 people (57.14%), while the fewest were 12-15 years old, namely 3 people (3.90%).

##### 3.1.3. Description of Respondents' Nutritional Knowledge

Nutritional knowledge is measured by assessing the subject's answers to a questionnaire containing questions about nutritional knowledge. The results of measuring nutritional knowledge are presented in the following table.

**Table 4.** Description of Respondents' Nutritional Knowledge

Category	Frequency	Percentage (%)
Not enough	14	18.18 %
Enough	24	31.17 %
Good	39	50.65 %
<b>Amount</b>	<b>77</b>	<b>100 %</b>

Based on table 4, it shows that the level of nutritional knowledge of teenagers in Kediri Regency is in the good category, this is proven by the percentage value being higher than the other categories, namely 50.65%, then the percentage value for the sufficient category is 31.17%, for the poor category value. amounting to 18.18%. This shows that the average nutritional knowledge in adolescents is dominated by the good category. The research results show that there are still a small number of teenagers who have good nutritional knowledge (Veronika et al., 2021).

### 3.1.4. Description of Respondents' Food Choice Attitudes

The percentage of food choice attitude categories among teenagers in Kediri Regency based on food choice attitude values resulting from calculations based on the rubric can be seen in the following table.

**Table 5.** Description of Respondents' Food Choice Attitudes

Category	Frequency	Percentage (%)
Not enough	2	2.60 %
Enough	50	64.94 %
Good	25	32.47 %
<b>Amount</b>	<b>77</b>	<b>100 %</b>

Based on table 5, it shows that the level of food choice attitudes of teenagers in Kediri Regency is in the sufficient category, this is proven by a higher percentage value, compared to other categories, namely 64.94%, then the percentage value is less at 2.60%, for the value good category of 32.47%. This shows that the average attitude towards food choices among teenagers is dominated by the moderate category. The research results show that there are still a small number of teenagers who have a good attitude towards choosing food.

### 3.1.5. Description of Respondents' Eating Behavior

The results of the questionnaire regarding the percentage of eating behavior given to 77 respondents can be seen in the following table.

**Table 6.** Description of Respondents' Eating Behavior

Category	Frequency	Percentage (%)
Not enough	3	3.90 %
Enough	47	61.04 %
Good	27	35.06 %
<b>Amount</b>	<b>77</b>	<b>100 %</b>

Based on table 5, it shows that the level of eating behavior of teenagers in Kediri Regency is in the sufficient category, this is proven by a higher percentage value, compared to other categories, namely 61.04%, then the percentage value is less at 3.90%, for the category value good at 35.06%. This shows that on average, teenagers' eating behavior is dominated by the moderate category. The research results show that there are still a small number of teenagers who have good eating behavior.

### 3.2. The Relationship Between Nutritional Knowledge and Food Choice Attitudes and Adolescents' Eating Behavior

#### 3.2.1. The Relationship Between Nutritional Knowledge and Food Choice Attitudes

**Table 7.** The Relationship between Nutritional Knowledge and Food Choice Attitudes

Attitude	Nutrition Knowledge			Total	Sig.
	Good	Enough	Not enough		
Good	17	21	1	<b>39</b>	<b>0.160</b>
	68.0 %	42.0 %	50.0 %	<b>50.6 %</b>	
Enough	6	18	0	<b>24</b>	
	24.0 %	36.0 %	0.0 %	<b>31.2 %</b>	
Not enough	2	11	1	<b>14</b>	
	8.0 %	22.0 %	50.0 %	<b>18.2 %</b>	
<b>Total</b>	<b>25</b>	<b>50</b>	<b>2</b>	<b>77</b>	
	<b>100.0 %</b>	<b>100.0 %</b>	<b>100.0 %</b>	<b>100.0 %</b>	

Table 7 shows that there were 39 respondents with attitudes towards choosing food in the good category, with 17 people having good, 21 people having enough and 1 person having poor nutritional knowledge. The attitude towards choosing food in the sufficient category was 24 people, with 6 people having good and 18 people having sufficient nutritional knowledge. The attitude towards choosing food in the poor category was 14 people with 2 people having good, 11 people having enough and 1 person having poor nutritional knowledge. The results of the chi square analysis obtained a sig value of  $0.160 > 0.05$ , which means there is no relationship between nutritional knowledge and attitudes towards food choices of teenagers in Kediri Regency. It can be said that nutritional knowledge does not always influence attitudes in choosing food in adolescents. Although in terms of nutritional knowledge it can influence attitudes towards choosing food in adolescents, this relationship can be seen where the better the nutritional knowledge of eating, the better a person's attitude in choosing food and vice versa, the less the attitude towards choosing food, the less nutritional knowledge a person will have (Chen & Antonelli, 2020).

#### 3.2.2. The Relationship Between Nutritional Knowledge and Eating Behavior

**Table 8.** The Relationship between Nutritional Knowledge and Eating Behavior

Eating Behavior	Nutrition Knowledge			Total	Sig.
	Good	Enough	Not enough		
Good	20	19	0	<b>39</b>	<b>0.000</b>
	74.1 %	40.4 %	0.0 %	<b>50.6 %</b>	
Enough	7	17	0	<b>24</b>	
	25.9 %	36.2 %	0.0 %	<b>31.2 %</b>	
Not enough	0	11	3	<b>14</b>	
	0.0 %	23.4 %	100.0 %	<b>18.2 %</b>	
<b>Total</b>	<b>27</b>	<b>47</b>	<b>3</b>	<b>77</b>	
	<b>100.0 %</b>	<b>100.0 %</b>	<b>100.0 %</b>	<b>100.0 %</b>	

Table 8 shows that there were 39 respondents with eating behavior in the good category, with 20 people having good and 19 people having sufficient nutritional knowledge. There were 24 people categorized as adequate eating behavior, with 7 people having good and 17 people having sufficient nutritional knowledge. There were 14 people in the category of poor eating behavior, with 11 people having sufficient knowledge and 3 people lacking nutritional knowledge. The results of the Chi Square analysis obtained a sig value of  $0.000 < 0.05$ , which means there is a relationship between nutritional knowledge and eating behavior of teenagers in Kediri Regency. This is because nutritional knowledge can influence eating behavior in adolescents, which is an important role of knowledge in forming a person's eating habits by influencing the way a person chooses the type and amount of food consumed. Community behavior is very closely related to community knowledge which can be obtained through health education activities because without good knowledge it will be difficult for someone to change their behavior as an effort to prevent disease (Jiang et al., 2024).

### 3.2.3. The Relationship Between Food Choice Attitudes and Eating Behavior

**Table 9.** The Relationship between Food Choice Attitude and Eating Behavior

Eating Behavior	Attitude			Total	Sig.
	Good	Enough	Not enough		
Good	16 59.3 %	9 19.1 %	0 0.0 %	25 32.5 %	0.005
Enough	11 40.7 %	36 76.6 %	3 100.0 %	50 64.9 %	
Not enough	0 0.0 %	2 4.3 %	0 0.0 %	2 2.6 %	
<b>Total</b>	<b>27</b> <b>100.0 %</b>	<b>47</b> <b>100.0 %</b>	<b>3</b> <b>100.0 %</b>	<b>77</b> <b>100.0 %</b>	

Table 9 shows that there were 25 respondents with good eating behavior, with 16 good and 9 good food choices. There were 50 people in the moderate category of eating behavior, with 11 people being good, 36 people having enough and 3 people having poor attitudes towards food choices. There are 2 people in the category of poor eating behavior, with 2 people having enough attitude towards food choices. The results of the Chi Square analysis obtained a sig value of  $0.005 < 0.05$ , which means that there is a relationship between food choice attitudes and eating behavior of teenagers in Kediri Regency. A person's positive attitude towards health may not directly make a person's behavior positive, but a negative attitude towards health almost certainly makes a person's behavior negative. This is more likely to lead to food choice behavior which is reflected in teenagers' eating habits (Kowalkowska et al., 2018).

### 3.3. The Influence Between Nutritional Knowledge and Food Choice Attitudes on Adolescents' Eating Behavior

**Table 10.** The Influence between Nutritional Knowledge and Food Choice Attitude on Adolescents' Eating Behavior

P.G	Attitude	Eating Behavior			Total	Sig.
		Good	Enough	Not enough		

Good	Good	12 60.0 %	5 26.3 %	0 0.0 %	17 43.6 %	
	Enough	8 40.0 %	13 68.4 %	0 0.0 %	21 53.8 %	
	Not enough	0 0.0 %	1 5.3 %	0 0.0 %	1 2.6 %	
	Total	20 100.0 %	19 100.0 %	0 0.0 %	39 100.0 %	
Enough	Good	4 57.1 %	2 11.8 %	0 0.0 %	6 25.0 %	
	Enough	3 42.9 %	15 88.2 %	0 0.0 %	18 75.0 %	
	Total	7 100.0 %	17 100.0 %	0 0.0 %	24 100.0 %	
Not enough	Good	0 0.0 %	2 18.2 %	0 0.0 %	2 14.3 %	<b>0.005</b>
	Enough	0 0.0 %	8 72.7 %	3 100.0 %	11 78.6 %	
	Not enough	0 0.0 %	1 9.1 %	0 0.0 %	1 7.1 %	
	Total	0 0.0 %	11 100.0 %	3 100.0 %	14 100.0 %	
Total	Good	16 59.3 %	9 19.1 %	0 0.0 %	25 32.5 %	
	Enough	11 40.7 %	36 76.6 %	3 100.0 %	50 64.9 %	
	Not enough	0 0.0 %	2 4.3 %	0 0.0 %	2 2.6 %	
	Total	27 100.0 %	47 100.0 %	3 100.0 %	77 100.0 %	

Information :

P.G : Nutrition Knowledge

Based on the table above, the results of the multiple linear regression test show that the multiple correlation (R) value is  $0.005 < 0.05$ , which means that there is an influence between nutritional knowledge and attitudes towards eating on adolescent eating behavior. This knowledge of nutrition and the attitude of choosing good food greatly influences the eating behavior of teenagers because it has a direct impact on fulfilling balanced nutrition and a person's health condition (Naeeni, et al., 2014).

Nutritional knowledge possessed by teenagers is a basic provision to fulfill the body's nutrition, but it cannot guarantee that someone has a good diet and is in accordance with balanced nutritional guidelines if it is not based on strong motivation and self-awareness (Hamulka et al., 2018). Teenage eating patterns are determined by their attitudes in choosing the food they consume every day (Rachmi et al., 2021).



Humans need food to carry out daily activities and to support growth. If the food consumed is less than the body's needs, the food reserves in the body will be used up, and if this continues to happen it can result in weight loss and a decrease in other nutrients. Lack of nutrients in the body can cause stunted physical growth, decreased body immunity and decreased academic achievement. Providing good nutrition for teenagers will produce the nation's next generation who are healthy, qualified, productive and can compete in academic and non-academic potential.

#### 4. CONCLUSION

Based on the results of the research that has been carried out, it can be concluded as follows: There is no relationship between nutritional knowledge and food choice attitudes in adolescents aged 12-21 years in Kediri Regency. There is a relationship between nutritional knowledge and eating behavior in adolescents aged 12-21 years in Kediri Regency. There is a relationship between food choice attitudes and eating behavior in adolescents aged 12-21 years in Kediri Regency. There is an influence between nutritional knowledge and attitudes towards food choices on the eating behavior of adolescents in Kediri Regency. Based on the evaluation of the research that has been carried out, suggestions that can be given for further research are: In research on eating behavior in adolescents, further research can be carried out related to degenerative diseases, obesity and malnutrition or underweight Further research needs to be carried out to examine other factors not examined in this study such as culture, beliefs, surrounding environment and so on.

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