Media Gizi Kesmas
p-ISSN 2301-7392, e-ISSN 2745-8598
10.20473/mgk.v14i2.2025.243-249

ORIGINAL ARTICLE Open Access

Association between Knowledge and Attitudes and Practices of Sugar, Salt, and Fat Consumption among Junior High School Students

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Submitted: 06-05-2025
Accepted: 18-11-2025
Published: 01-12-2025

Citation:
Andjani, S., & Nadhiroh, S. R. (2025). Association between Knowledge and Attitudes and Practices of Sugar, Salt, and Fat Consumption among Junior High School Students. *Media Gizi Kesmas*, 14(2), 243-249. https://doi.org/10.20473/mgk.v14i2.2025.243-249

ABSTRACT

Background: Junior High School (JHS) students are teenagers who are vulnerable to having health problems with the occurrence of problems in their nutritional status. One of the causes of abnormal nutritional status is through eating patterns such as excessive consumption of food with additional food ingredients such as sugar, salt, and fat (oil). Recommendations for consuming these additional ingredients have been written in Ministerial Regulation of the Ministry of Health No. 30 of 2013.
Objectives: The purpose of this study was to analyze the association between knowledge and attitudes with practices about sugar, salt, and fat consumption of students at State Junior High School 17 Surabaya.
Methods: This study is included in quantitative research with a cross-sectional research design. The sample used was 82 students. Data collection included anthropometric measurements and filling out questionnaires regarding sugar, salt, and fat. Data were analyzed using the chi-square test.
Results: The results showed that there was an association between knowledge and practices regarding sugar, salt, and fat consumption (p=0.000) as well as attitudes and practices regarding sugar, salt, and fat consumption (p=0.000).
Conclusion: The conclusion of this study is that knowledge and attitudes are related to practices regarding sugar, salt, and fat consumption, and practices about sugar, salt, and fat consumption have a relationship with the nutritional status of students. Suggestions that can be given are that schools can evaluate school canteens related to food and drinks with high sugar, salt, and fat content to reduce the chances of students having poor consumption behavior, and students are expected to always increase their insight and be careful in consuming food and drinks that contain additional food ingredients.

Keywords: Fat, Healthy Lifestyle, Salt, Student, Sugar

INTRODUCTION

The nutritional status of Indonesian adolescents aged 13-15 years based on data *Survei Kesehatan Indonesia* (SKI) 2023 was found to be 5.7% (thinness), 12.1% (overweight), and 4.1% (obese). Meanwhile, in East Java, the incidence of thinness reached 5.5%, overweight reached 15.0%, and obesity reached 4.8% (Badan Kebijakan Pembangunan Kesehatan, 2023). Rachmi et al. (2019) argue that physical changes will occur in a child who grows and develops until adolescence, this can be related to the energy intake need in daily. This condition is closely related to eating patterns such as consumption habits and lifestyle. There is one adolescent health problem that is related to several aspects that have been mentioned previously; this condition is a nutritional problem that can occur in an adolescent.

Februhartanty et al. (2019) state that a teenager who has a negative body image can encourage teenagers to go on a diet with the aim of losing weight because they do not like their body condition. Wrong diet practices, such as skipping breakfast, dieting with braces, and smoking, can cause eating disorders such as anorexia nervosa and bulimia nervosa. Wahyuningsih and Ninggrat (2019) explained the risk of degenerative diseases that can occur in old age which can accompany obese

adolescents, for example, diabetes mellitus 2, hypertension, heart disease, respiratory tract disorders, osteoarthritis, stroke, and fertility disorders, especially for women.

Through a literature study Banjarnahor et al. (2022), there are several risk factors for overweight and obesity in adolescents, such as socioeconomic and demographic factors, physical activity and lifestyle, parenting patterns, and eating patterns and habits. Fauziyyah et al. (2021) state that consumption habits are the main factor and have an influence on a person's nutritional needs. This is because the interaction of food and drink can have an impact on health, which begins by influencing nutritional status.

According to balanced nutrition in the official dietary guidelines of the Ministry of Health quoted by Rahayu et al. (2023), it states that there are 10 balanced nutrition messages that can be a solution to adolescent nutritional problems. The message is that there are several types of food if consumed in larger amounts than recommended, a person can have various diseases in the future. Foods that need to be limited in consumption are foods that have a sweet taste where there is sugar content, salty taste that contains salt, and fattening foods or fried foods.

Shapu et al. (2020) indicate that adolescents knowledge of nutrition has an impact on their attitudes and practices when choosing the food that they want to consume. Unhealthy food consumption habits are a reflection of poor nutritional knowledge and practices. Research Kusumawati et al. (2023) on junior high school students' knowledge of daily sugar, salt, and fat consumption daily limits showed a very low initial understanding, where the respondents did not understand at all about the recommended consumption of sugar, salt, and fat. Dewanti et al. (2023) reveal that the better the nutritional knowledge of adolescents, the better their attitudes will be. His research showed that out of 99 respondents with good nutritional knowledge, 66.7% of respondents had good attitudes.

Based on the research by Dwinugraha and Anggiruling (2022), the consumption of Sugar, Salt, and Fat (SSF) is closely linked to malnutrition problems. Similarly, Kartolo and Santoso (2022) found that among junior high school students, SSF intake was significantly associated with obesity. These findings indicate that adolescents' SSF consumption practices may contribute to various nutritional issues. Research by Nurbaeti and Barizah (2019) further revealed that 65% of adolescents had poor dietary patterns, largely due to a preference for fast food and snacks, which are considered more practical and affordable. However, the presence of nutrition labels on food packaging does not always ensure that the products meet nutritional adequacy, emphasizing the need for greater awareness of healthy food choices in both quality and quantity.

Preliminary observations at SMP Negeri 17 Surabaya showed that many street vendors and food stalls operate around the school, particularly after school hours. These vendors offer foods and beverages high in sugar, salt, and fat, commonly prepared by frying, which may influence students' eating habits. This study offered novel insights by examining the interrelationship between knowledge, attitudes, and practices related to SSF consumption among early adolescents, a population often underrepresented in dietary behavior research. Unlike prior studies focusing on adults or single nutrients, this research simultaneously investigated three major dietary risk factors associated with non-communicable diseases. The study aimed to assess levels of knowledge, attitudes, and practices regarding SSF consumption and to determine their interrelationships. It sought to answer: *"*Is there a significant association between students knowledge and attitudes toward SSF consumption and their actual dietary practices*?"*

METHODS

This type of research is quantitative research with a cross-sectional research design. The independent variables used in this study are knowledge and attitude, while the dependent variable is practice. This study has passed the ethical review with research ethics number 0216/HRECC.FODM/II/2025.

The location of research was conducted at SMP Negeri 17 Surabaya with a population of students in grades VII and VIII. Through the calculation of the sample size, 82 students were found to be the research respondents. Then a proportion calculation was carried out to determine the number of each class level. The number of students in class VII was 42 students and in class VIII was 40. In sampling, the non-probability sampling method used is convenience sampling. The time of data collection was carried out in February 2025. Data was obtained through weighing, measuring height, and filling out questionnaires directly with students answering statements on the questionnaire paper. The inclusion criteria for this research sample include: 1) Students are willing to be research respondents, and 2) Students are in good health.

The instruments used for data collection include the characteristics of students and students' parents, as well as knowledge, attitudes, and practices of sugar, salt, and fat consumption. The questionnaire used in this study was developed with the KAP (Knowledge, Attitude, and Practice) theory through previous research references and language simplification (Teng et al.,2019; Arifen et al., 2024; Moitra et al., 2021). In addition, this questionnaire has passed validity and reliability tests. The level of knowledge is classified as high when the score is

22.5 or above, whereas attitude and practice are classified as positive and good, respectively, when each score is 37.5 or above.

This study used two methods of analysis there are univariate and bivariate. The use of univariate analysis to obtain the results of the frequency distribution of student characteristic variables consisting of class, age, gender, and amount of pocket money. Then, the characteristics of students' parents, which include education, occupation, and income. In addition, there is a level of knowledge, attitude, and practice of sugar, salt, and fat consumption. While bivariate analysis was carried out to obtain a correlation between knowledge and attitudes with practices of sugar, salt, and fat consumption. This analysis uses SPSS V.26 software and in statistical tests including the chi-square test with a p-value <0.05, which means there is a relationship between the variables tested.

RESULTS AND DISCUSSION

Based on the data on student characteristics obtained, it can be seen that the distribution of student ages shows that the ages are divided into 3 groups there are 12 years, 13 years, and 14 years. Of the total 82 students, the largest number is 13 years old, with a percentage reaching 59% and the smallest is 12 years old (7%). Students who participated in this study were male and female, with the largest number of which was female students, reaching 61% of the total students. Then, for student pocket money, it is money given by parents and is only used to buy food and drinks in a day. The average pocket money of respondents in this study was Rp. 11.621. Based on this average, the amount of pocket money is grouped into 2: there are high and low. Thus, it is known that as many as 52 students get pocket money <Rp. 11.621 in a day. Student characteristics can be seen clearly in Table 1.

Table 1. Student Characteristics

Characteristics	Amount (n)	Percentage (%)
Age (year)		
12	6	7.0
13	48	59.0
14	28	34.0
Gender		
Male	32	39.0
Female	50	61.0
Pocket money		
High (>Rp 11.621)	30	36.6
Low (<Rp 11.621)	52	63.4
Total	82	100.0

Based on the data on the characteristics of the students parents obtained, it can be seen that the frequency distribution of parental education shows that the highest education of the students' parents is high school graduates for fathers (47.6%) and college graduates for mothers (48.8%). Then, for the occupation of the students' parents, it is collected based on several categories. Through the data obtained for the highest results, there are 39 fathers who work as private employees, while 40 mothers do not work and focus on being at home as housewives. In addition, there are other categories which are jobs other than those grouped, such as selling online, journalists, writers, or retired parents. Meanwhile, the income of the students' parents is the nominal wage earned each month. This income is a combination of the father's and the mother's. Based on the data obtained, income grouping was used using the UMK (Minimum City Wage) of Surabaya in 2025 of Rp. 4.961.753 as a benchmark in determining the category. It can be seen that the highest income is in the high income category (>UMK Surabaya) with a percentage of 51.2%, although this figure is not too far from the low income category (<UMK Surabaya). The characteristics of students' parents can be seen clearly in Table 2.

Table 2. Students' Parents Characteristics

Characteristics	Father		Mother	
	Amount (n)	Percentage (%)	Amount (n)	Percentage (%)
Education				
Elementary school graduate	5	6.1	4	4.9
Junior high school graduate	7	8.5	10	12.2
Senior high school graduate	39	47.6	28	34.1
College graduate	31	37.8	40	48.8
Occupation				
Civil servants	12	14.6	7	8.5

Characteristics	Father		Mother	
	Amount (n)	Percentage (%)	Amount (n)	Percentage (%)
Private employee	39	47.6	21	25.7
Self-employed	22	26.8	7	8.5
Laborer	3	3.7	0	0.0
Other	6	7.3	7	8.5
Unemployed	0	0.0	40	48.8
Total	82	100	82	100.0

Characteristics	Amount (n)	Percentage (%)
Income		
High (>Rp 4.961.753)	42	51.2
Low (<Rp 4.961.753)	40	48.8
Total	82	100.0

The knowledge aspect, a total score was obtained regarding sugar, salt, and fat, which was then grouped based on predetermined categories, including high knowledge and low knowledge. Based on the data obtained, there were 62 students with high knowledge. This number is more than students with low knowledge. The attitude aspect, a total score was obtained regarding sugar, salt, and fat, which was then grouped based on predetermined categories, including positive attitudes and negative attitudes. A total of 58 students had a positive attitude towards sugar, salt, and fat consumption. The practice aspect, a total score was obtained regarding sugar, salt, and fat, which was then grouped based on predetermined categories, including good practices and poor practices. Compared to the poor practices category, good behavior showed a higher frequency and percentage, reaching 72%. The level of knowledge, attitude, and behavior of sugar, salt, and fat consumption can be seen clearly in Table 3.

Table 3. Level of Knowledge, Attitudes, and Practices of Sugar, Salt, and Fat Consumption

Aspect	Amount (n)	Percentage (%)
Knowledge		
High	62	75.6
Low	20	24.4
Attitudes		
Positive	58	70.7
Negative	24	29.3
Practices		
Good	59	72.0
Poor	23	28.0
Total	82	100.0

Association between Knowledge with Practices of Sugar, Salt, Fat Consumption

Cross-tabulation of the association between knowledge and practices of sugar, salt, and fat consumption is presented in Table 4. The results of the chi-square test show a significant relationship between knowledge and these dietary practices (p-value<0.05). This finding indicates that individuals with higher levels of knowledge tend to adopt better practices in controlling the intake of sugar, salt, and fat. According to Miller et al. (2015), people tend to adopt healthier eating behaviors when they are well-informed about proper food choices and aware of how their diet affects health. There is a study Daniel and Triyanti (2023) whose research results are in line with this study, where there is a significant correlation between the level of knowledge and practices of sugar consumption (p-value=0.015). Furthermore, research Nadhiroh et al. (2022) in Kulon Progo Regency, Yogyakarta, found that there was a relationship between a person's level of knowledge and practices of salt consumption (p-value=0.000). In addition, the results of the study obtained by Merita and Junita (2021) showed that there was a significant relationship between knowledge and the habit of eating fatty foods (p-value=0.005).

The use of food additives in food and beverages needs to be limited. Consumption recommendations as stated in the Ministerial Regulation of the Ministry of Health No. 30 of 2013. It is stated that a person is at risk of developing degenerative diseases or non-communicable diseases if they consume each of these food ingredients in amounts that exceed the recommended daily consumption limit.

According to Syapitri et al. (2021) various theories that are created will experience continuous development which is able to realize the collection of knowledge that is the embodiment of science. In addition, there is a scientific approach that can be used to accumulate knowledge into a science.

Someone who has the skills to think and a great interest can play a role in forming one of the factors in realizing the development of existing theories. Someone who has curiosity allows the knowledge they have to increase. With the knowledge they have, someone can determine the actions to be taken.

Table 4. Association between Knowledge with Practices of Sugar, Salt, and Fat Consumption

Knowledge	Practices				Total		p-value
	Good		Poor				
	n	%	n	%	n	%	
High	57	91.9	5	8.1	62	100	<0.001
Low	2	10.0	18	90.0	20	100	

Association between Attitudes with Practices of Sugar, Salt, and Fat Consumption

Cross-tabulation of the association between attitudes and practices of sugar, salt, and fat consumption can be seen in Table 5. Through the results of the analysis using the statistical chi-square test, it is known that there is a relationship between attitudes and practices of sugar, salt, and fat consumption, which is indicated by a p-value<0.05. This finding suggests that individuals with more positive attitudes toward healthy eating tend to exhibit better practices in controlling the intake of sugar, salt, and fat. In the context of the Theory of Planned Behavior, a positive attitude toward healthy nutrition serves as a pivotal factor influencing the intention to engage in and sustain healthy dietary practices. Furthermore, such an attitude contributes to greater perceived behavioral control, facilitating individuals' ability to overcome barriers to healthy eating (Ajzen, 1991).

There is a study by Gedi and Tasyikan (2022) whose research results are in line with this study. It was stated that respondents who have negative attitudes excessively consume Sugar-Sweetened Beverages (SSBs), as there is drinks containing high amounts of added sugar, which explains that there is a correlation between attitudes and practices of SSBs consumption (p-value=0.05). Furthermore, Ismail et al. (2021) their research found that women have better attitudes towards salt intake and health compared to men, which also shows a relationship between attitudes and practices of salt consumption (p-value=0.044). In addition, the research results from Merita and Junita (2021) Jambi found that there was a relationship between perceptions of fattening food and fatty food habits (p-value=0.008).

According to Sukaryawa and Sari (2023) the effort made in determining a target to be liked or disliked is one of the tendencies in the manifestation of a person's attitude. The attitude formed in a person is obtained from the activity of studying and copying something positive, also based on verbal information that is received and reinforced. In the learning process, students' attitudes will affect their responses and practices. If students are positive, they will work to ensure the learning process runs smoothly and brings benefits.

Table 5. Association between Attitudes with Practices of Sugar, Salt, Fat Consumption

Attitudes	Practices				Total		p-value
	Good		Poor				
	n	%	n	%	n	%	
Positive	56	96.6	2	3.4	58	100	<0.001
Negative	3	12.5	21	87.5	24	100	

The limitations of this study are that the technique used to determine and take samples may not represent the entire population. The cause could be due to the use convenience sampling technique. In addition, data collection is not carried out through face-to-face interviews, which can cause data to be biased.

CONCLUSION

Consumption practices can be based on the knowledge and attitudes of adolescents. This study shows that there is an association between knowledge and attitudes with practices of sugar, salt, and fat consumption in students of SMP Negeri 17 Surabaya. Suggestions given to schools can help evaluate school canteens related to food and drinks with high sugar, salt, and fat content to reduce the chances of students having bad consumption practices, and students are expected to always increase their insight and be careful in consuming food and drinks that contain additional food ingredients.

Acknowledgement

The author would like to thank the parties who have helped facilitate this research, the teachers of SMP Negeri 17 Surabaya who allowed and provided facilities during the research, and the students of SMP Negeri 17 Surabaya who were willing to be respondents of this research. Then, thanks are addressed to the supervising lecturer, Mrs.

Siti Rahayu Nadhiroh, and other lecturers and staff who helped in the continuation of this research.

Conflict of Interest and Funding Disclosure

None.

Author Contributions

SA: conceptualization, data curation, formal analysis, funding acquisition, methodology, investigation, project administration, resources, writing–original draft; SRN: supervision, review, and editing.

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