

Adolescent Knowledge and Attitudes toward Sugar, Salt, and Fat Consumption at MAN 1 Bekasi Regency

Siti Nailal Ghinah¹, Widya Lestari Nurpratama², Nur Fauzia Asmi³, Dandi Sanjaya⁴

^{1,2,3,4} Bachelor of Nutrition Study Program, Faculty of Health Sciences,
Universitas Medika Suherman, Bekasi, Indonesia

Corresponding Author: ghinan35@gmail.com

ARTICLE HISTORY

Received [31 July 2026]

Revised [11 September 2026]

Accepted [14 September 2026]

Keywords :

Adolescents, Attitude, GGL
Consumption, Nutrition
Knowledge, SQ-FFQ.

This is an open access article
under the [CC-BY-SA](https://creativecommons.org/licenses/by-sa/4.0/) license



ABSTRACT

Adolescence is a transitional phase marked by shifts in lifestyle and dietary habits, with a high preference for sugar, salt, and fat (GGL). Excessive consumption of GGL during this growth period significantly elevates the long-term risk of non-communicable diseases (NCDs). This study aims to analyze the overall descriptive and analytical framework of nutrition knowledge, attitudes, and GGL consumption patterns among school adolescents. This quantitative study utilized an analytical observational cross-sectional design. A sample of 86 eleventh-grade school adolescents was selected through a purposive sampling approach. Data on nutrition knowledge (15 multiple-choice questions) and attitudes (10 Likert-scale statements) were gathered using validated self-administered questionnaires. Dietary consumption patterns of GGL over the past 14 days were measured via a Semi-Quantitative Food Frequency Questionnaire (SQ-FFQ). Univariate and bivariate data were evaluated using the Chi-Square test ($\alpha = 0.05$) through SPSS software. Univariate analysis indicated that the majority of respondents maintained an adequate intake category for sugar (75.6%), salt (73.3%), and fat (72.1%). Bivariate Chi-Square analysis revealed no statistically significant association between nutrition knowledge and the consumption patterns of sugar ($p=0.621$), salt ($p=0.866$), or fat ($p=0.588$). Similarly, no significant correlation was found between attitudes and the intake of sugar ($p=0.433$), salt ($p=0.640$), or fat ($p=0.390$). These outcomes show a profound knowledge-practice and attitude-behavior gap, where cognitive and affective proficiency is overridden by food preferences and structural peer influences. Individual nutrition knowledge and attitudes do not serve as linear determinants of actual GGL intake among school adolescents. Educational institutions should transition toward managing the behavioral food micro-environment rather than relying solely on conventional direct cognitive education.

INTRODUCTION

Adolescence is a transitional period from childhood to adulthood characterized by various physical, psychological, and behavioral changes, including dietary patterns. During this phase, adolescents tend to have less healthy eating patterns and prioritize taste over the nutritional value of the foods they consume. Changes in modern lifestyles and peer influence cause adolescents to consume fast food more frequently and try foods and beverages that are currently popular. These consumption habits require attention because they can affect adolescent health both at present and in the future (Amrinanto et al., 2025). Non-communicable diseases (NCDs) are a major cause of death at both the global and national levels. The occurrence of NCDs is influenced by various factors, one of which is an unhealthy lifestyle that leads to changes in dietary patterns. Adolescents are one of the groups that frequently consume snacks high in sugar, salt, and fat (GGL). This condition requires attention because high GGL consumption during adolescence has the potential to increase the risk of NCDs in the future (Dwijayanti et al., 2025).

Based on data from the Indonesian Ministry of Health through Risesdas 2018 among adolescents aged 15–19 years, daily consumption of sweet foods was 50.90%, sweetened beverages 63.12%, salty foods 56.09%, and fatty/fried foods 54.59% (Kementrian Kesehatan Republik Indonesia., 2013). These data indicate a high level of risky food consumption among adolescents that may affect their future health. Research in an urban school environment also found that 79.2% of adolescents consumed excessive sugar, 88.9% consumed excessive salt, and 66.7% consumed excessive fat (Amalia, 2024). High GGL consumption among adolescents is influenced by several factors, such as low nutrition knowledge and attitudes in food selection. Adolescents tend to choose foods based on taste, trends, and environmental influences without considering their nutritional content (Nadhiroh et al., 2025). It was shown that low knowledge and negative attitudes toward food were significantly associated with GGL intake ($p = 0.000$). Therefore, knowledge and attitudes are important factors in improving adolescent consumption patterns.

The Semi-Quantitative Food Frequency Questionnaire (SQ-FFQ) is an instrument used to assess an individual's food consumption habits over a certain period by considering both the frequency and amount of food consumed. The SQ-FFQ can be used to estimate nutrient intake because this method not only records how often foods are consumed but also takes into account the portion sizes eaten by respondents. Therefore, the SQ-FFQ is considered capable of providing a more detailed picture of long-term consumption patterns and is practical for use in nutrition research (Ardiyanti, 2025).

RESEARCH METHODS

This study was a quantitative study with an analytical observational design using a cross-sectional approach. This approach was selected because all variables, both independent variables (nutrition knowledge and attitudes) and dependent variables (sugar, salt, and fat/GGL consumption patterns), were measured at the same point in time to examine associations between variables without any intervention or treatment of the research subjects. The population in this study included all Grade XI students at MAN 1 Bekasi Regency aged 16–17 years, totaling 360 students. The research target was focused on Grade XI students based on the consideration that this age group is in middle adolescence, which is characterized by increasingly mature cognitive abilities and greater independence in choosing and determining daily foods. The sample size was calculated using the Slovin formula with a 10% margin of error while considering limitations of time, personnel, and field conditions. Based on the mathematical calculation using this formula, a minimum sample size of 78.26 was obtained and rounded to 79 respondents. To anticipate dropouts, absence, or incomplete questionnaire data, the sample was increased by 10%, resulting in a final total of 86 respondents.

The sampling technique used was purposive sampling based on inclusion and exclusion criteria established by the researchers. The inclusion criteria were active Grade XI students who were willing to participate as respondents and voluntarily complete the entire research process, while the exclusion criteria included students who were absent during data collection or who completed the questionnaire incompletely. This technique ensured that the collected data were truly representative and aligned with the specific objectives of the study. Primary data were obtained directly from respondents through structured questionnaires and interviews using standardized instruments. Nutrition knowledge was measured using a 15-item multiple-choice questionnaire adopted from (Utami et al., 2023), which had previously undergone validity and reliability testing with a Cronbach's alpha value of 0.720 (reliable category). Attitudes were measured using a 10-item Likert-scale questionnaire adopted from (Utami et al., 2023) with a Cronbach's alpha value of 0.647. Meanwhile, GGL consumption patterns were assessed using the Semi-Quantitative Food Frequency Questionnaire (SQ-FFQ) covering eating habits during the previous 14 days (Shabrina et al., 2019; Swari et al., 2023).

Daily intake obtained from the SQ-FFQ conversion was then compared with safe threshold limits based on the recommendation of the Regulation of the Minister of Health of the Republic of Indonesia (Permenkes) No. 63 of 2015, namely sugar consumption <50 grams/day, salt <5 grams/day, and fat <67 grams/day. Data processing was carried out through editing, coding, entry, and cleaning stages before proceeding to statistical analysis using computer software. Data analysis was conducted in two stages: univariate analysis to describe the frequency distribution of respondent characteristics and each research variable, and bivariate analysis to test the association between independent and dependent variables using the Chi-Square test (with Fisher's Exact Test as an alternative when Chi-Square assumptions were not met) at a 95% confidence level ($\alpha = 0.05$). This study also considered legal and subject-protection aspects by obtaining official ethical approval from the Research Ethics Committee of Universitas Medika Suherman with Ethical Clearance Number: 004637/UNIVERSITAS MEDIKA SUHERMAN/2026.

RESULTS

Respondent Characteristics

This study involved 86 Grade XI students at MAN 1 Bekasi Regency. The respondent characteristics analyzed included age, sex, and daily allowance. These characteristics are presented to provide a general description of the respondent profile in this study.

Table 1. Characteristics of Research Respondents (n=86)

Characteristics	n	%
Age (years)		
Mean $\bar{x} \pm SD$	16,93 $\pm$ 0,256	
Sex		
Male	24	27,9
Female	62	72,1
Daily allowance		

Low (Rp7,000–Rp15,000)	2	2,3
Moderate (Rp15,000–Rp29,000)	79	91,9
High (Rp30,000–Rp50,000)	5	5,8

Note: SD = Standard Deviation.

Based on Table 1, the mean age of respondents was 16.93 ± 0.256 years. By sex, most respondents were female, totaling 62 students (72.1%), while 24 students (27.9%) were male. Based on daily allowance, most respondents were in the moderate category, namely Rp15,000–Rp29,000, totaling 79 students (91.9%). Five respondents (5.8%) had a high daily allowance, while 2 respondents (2.3%) were in the low category.

Distribution of Research Variables

The subsequent descriptive analysis was conducted on the main research variables, namely nutrition knowledge, attitudes, and sugar, salt, and fat (GGL) consumption patterns. The distribution of each variable is presented in Table 2.

Table 2. Distribution of Knowledge, Attitudes, and Sugar, Salt, and Fat Consumption Patterns among Respondents (n=86)

Variable	Category	n	%
Nutrition knowledge	Good	61	70,9
	Poor	25	29,1
Attitude	Good	63	73,3
	Poor	23	26,7
Sugar consumption pattern	Adequate	65	75,6
	Excessive	21	24,4
Salt consumption pattern	Adequate	63	73,3
	Excessive	23	26,7
Fat consumption pattern	Adequate	62	72,1
	Excessive	24	27,9

Based on Table 2, most respondents had good nutrition knowledge, totaling 61 respondents (70.9%), while 25 respondents (29.1%) had poor nutrition knowledge. For the attitude variable, the majority of respondents had a good attitude, totaling 63 respondents (73.3%), while 23 respondents (26.7%) had a poor attitude. In terms of GGL consumption patterns, most respondents were in the adequate consumption category. Adequate sugar consumption was found in 65 respondents (75.6%), while 21 respondents (24.4%) were in the excessive category. For salt consumption, 63 respondents (73.3%) were in the adequate category and 23 respondents (26.7%) were in the excessive category. Meanwhile, adequate fat consumption was found in 62 respondents (72.1%), while 24 respondents (27.9%) were in the excessive category. Consumption data were obtained using the Semi-Quantitative Food Frequency Questionnaire (SQ-FFQ) with a 14-day observation period.

Association between Knowledge and Sugar, Salt, and Fat Consumption Patterns

Bivariate analysis was conducted to determine the association between the level of nutrition knowledge and sugar, salt, and fat consumption patterns. The statistical test used was the Chi-Square test with a significance level of $\alpha=0.05$.

Table 3. Association between Knowledge and Sugar, Salt, and Fat Consumption Patterns (n=86)

Knowledge	Sugar Adequate n (%)	Sugar Excessive n (%)	P-value	Salt Adequate n (%)	Salt Excessive n (%)	P-value	Fat Adequate n (%)	Fat Excessive n (%)	P-value
Poor	18 (72,0)	7 (28,0)	0,621	18 (72,0)	7 (28,0)	0,866	17 (68,0)	8 (32,0)	0,588
Good	47 (77,0)	14 (23,0)		45 (73,8)	16 (26,2)		45 (73,8)	16 (26,2)	

Chi-Square test; $\alpha=0.05$.

Based on Table 3, among respondents with good knowledge, 77.0% had an adequate sugar consumption pattern, compared with 72.0% among respondents with poor knowledge. The Chi-Square test showed no significant association between nutrition knowledge and sugar consumption patterns ($p=0.621$). For salt consumption patterns, the proportion in the adequate category among respondents with good knowledge was 73.8%, compared with 72.0% among respondents with poor knowledge. The analysis showed no significant association between nutrition knowledge and salt consumption patterns ($p=0.866$). For fat consumption patterns, 73.8% of respondents with good knowledge were in the adequate consumption category, compared with 68.0% in the poor-knowledge group. This difference was not statistically significant ($p=0.588$). Overall, there was no significant association between nutrition knowledge and sugar, salt, or fat consumption patterns because all p-values were greater than 0.05.

Association between Attitudes and Sugar, Salt, and Fat Consumption Patterns

The next analysis was conducted to determine the association between attitudes and sugar, salt, and fat consumption patterns using the Chi-Square test at a significance level of $\alpha=0.05$.

Table 4. Association between Attitudes and Sugar, Salt, and Fat Consumption Patterns (n=86)

Attitude	Sugar Adequate n (%)	Sugar Excessive n (%)	P-value	Salt Adequate n (%)	Salt Excessive n (%)	P-value	Fat Adequate n (%)	Fat Excessive n (%)	P-value
Poor	16 (69,6)	7 (30,4)	0,433	16 (69,6)	7 (30,4)	0,640	15 (65,2)	8 (34,8)	0,390
Good	49 (77,8)	14 (22,2)		47 (74,6)	16 (25,4)		47 (74,6)	16 (25,4)	

Chi-Square test; $\alpha=0.05$.

Based on Table 4, respondents with good attitudes had an adequate sugar consumption proportion of 77.8%, while the proportion among those with poor attitudes was 69.6%. The Chi-Square test showed no significant association between attitudes and sugar consumption patterns ($p=0.433$). For salt consumption, the proportion of respondents in the adequate category was 74.6% in the good-attitude group and 69.6% in the poor-attitude group. Statistical analysis showed no significant association between attitudes and salt consumption patterns ($p=0.640$). For fat consumption, the proportion in the adequate category was 74.6% in the good-attitude group and 65.2% in the poor-attitude group. The Chi-Square test showed no significant association between attitudes and fat consumption patterns ($p=0.390$). Thus, there was no significant association between attitudes and sugar, salt, or fat consumption patterns among respondents because all p-values were greater than 0.05.

Summary of Analysis Results

Bivariate analysis showed that neither nutrition knowledge nor attitudes were significantly associated with sugar, salt, and fat consumption patterns among students at MAN 1 Bekasi Regency. The p-values for the associations between knowledge and sugar, salt, and fat consumption were 0.621, 0.866, and 0.588, respectively, while the p-values for the associations between attitudes and

sugar, salt, and fat consumption were 0.433, 0.640, and 0.390, respectively. All p-values were above $\alpha=0.05$.

Although no statistically significant associations were found, descriptively the proportion of adequate consumption tended to be higher among respondents with good knowledge and good attitudes than among those with poor knowledge and poor attitudes. These findings indicate descriptive differences in proportions, but the differences did not demonstrate statistically significant associations in this study.

DISCUSSION

Overview of Respondent Characteristics

The characteristics of respondents in this study included age, sex, and daily allowance, which provide context for understanding sugar, salt, and fat (GGL) consumption patterns among adolescents. Most respondents were aged 16–17 years, a phase of adolescence in which individuals begin to have greater independence in making food choices but are still influenced by the school environment, peers, digital media, and ease of access to food. These conditions make adolescents a group vulnerable to high-GGL food consumption (Kementerian Kesehatan Republik Indonesia., 2022; Maziyah et al., 2023; WHO., 2025; Yunita et al., 2024). By sex, there was a difference in the proportions of male and female respondents. Sex is related to physiological needs and food-consumption characteristics, although consumption behavior is determined not only by biological factors but also by knowledge, habits, and the environment. Research by (Prasetya et al., 2023) showed that females tend to have better knowledge than males, while (Mokodompit et al., 2025) showed differences in nutrient requirements and consumption characteristics by sex.

Meanwhile, respondents' daily allowances varied and may influence purchasing power and access to foods and beverages in the school environment. A larger allowance can provide adolescents with greater opportunities to purchase various types of food and increase snacking frequency. (Rahman et al., 2021) found an association between allowance and food-consumption behavior among adolescents, while (Agrina et al., 2023) showed that allowance is related to the ability to purchase snacks, including foods and beverages high in GGL. However, the amount of allowance is not the only factor determining food choices because consumption decisions are also influenced by knowledge, attitudes, habits, and the environment.

Association between Knowledge and GGL Consumption Patterns among School Adolescents

The results showed no significant association between nutrition knowledge and sugar, salt, and fat consumption patterns among students at MAN 1 Bekasi Regency. For sugar consumption, the p-value was 0.621, with an adequate consumption proportion of 72.0% among respondents with poor knowledge and 77.0% among respondents with good knowledge. For salt consumption, the p-value was 0.866, with adequate consumption proportions of 72.0% and 73.8%, respectively. Meanwhile, for fat consumption, the p-value was 0.588, with an adequate consumption proportion of 68.0% among respondents with poor knowledge and 73.8% among respondents with good knowledge. These findings indicate that good nutrition knowledge is not necessarily followed by more appropriate GGL consumption patterns. This condition illustrates a knowledge-practice gap, in which understanding of nutrition has not been fully applied in daily consumption behavior. This is consistent with the systematic review by (Thakur & Mathur et al., 2022), which showed that the relationship between nutrition knowledge and eating practices among children and adolescents is not always consistent. Nutrition knowledge alone may not be sufficient to produce changes in eating behavior because eating practices can also be influenced by various other factors, such as age, sex, nutritional status, lifestyle, peer influence, and support from parents or guardians.

The results of this study also differ from the study by (Masri et al., 2022), which found a significant association between nutrition literacy and sugar, salt, and fat consumption among adolescents. That study showed that nutrition literacy was associated with sugar, salt, and fat consumption, so adolescents with better nutrition literacy tended to be more capable of limiting the consumption of foods high in GGL. The difference in findings may be influenced by differences in population characteristics, measurement instruments, and the concepts used to measure knowledge. In the study by (Masri et al., 2022), nutrition literacy covered broader abilities in understanding food information, whereas this study measured knowledge based on understanding of definitions, food sources, the effects of excessive consumption, and GGL consumption limits.

Conversely, the results of this study are consistent with the study by (Ismail et al., 2022), which also showed no significant association between the level of knowledge and sugar consumption. These findings reinforce that a good level of knowledge does not automatically ensure the

implementation of consumption patterns that comply with health recommendations. This condition can be understood because knowledge is one factor that may influence consumption behavior, but it is not the only determining factor. Research in the thesis also showed that other factors such as eating habits, family environment, school environment, food availability, and peer influence may play a role in shaping adolescent consumption behavior. Thus, although respondents had good knowledge about GGL, environmental conditions and established habits may prevent that knowledge from being fully applied in daily food and beverage choices.

For salt consumption, the difference in the proportion of adequate consumption between the poor-knowledge and good-knowledge groups was also relatively small, at 72.0% and 73.8%, respectively. This condition indicates that respondents' knowledge was not sufficient to explain variation in salt consumption. This is consistent with the study by (Tamehi et al., 2024), which showed that knowledge is not always associated with better dietary patterns. In addition, sodium consumption can also be influenced by factors beyond knowledge, including the social conditions and environment in which individuals obtain and consume food. Therefore, students' ability to understand salt-consumption limits may not directly determine the types and amounts of food they choose in daily life.

A similar pattern was also observed for fat consumption. Respondents with good knowledge had an adequate fat-consumption proportion of 73.8%, compared with 68.0% among those with poor knowledge. Although there was a descriptive difference in proportions, the difference was not statistically significant. This result is consistent with the study by (Yugharyanti et al., 2024), which showed that knowledge is not always related to an individual's diet quality. The consumption of fatty foods may be influenced by eating habits, preferences for certain foods, the family environment, the school environment, and ease of access to high-fat foods. Thus, knowledge of the effects of excessive fat consumption may not be sufficient to change consumption habits if it is not supported by an environment and conditions that encourage the adoption of a healthy diet.

Overall, the results showed that nutrition knowledge was not significantly associated with sugar, salt, and fat consumption patterns among students at MAN 1 Bekasi Regency. These findings indicate that increasing knowledge alone does not necessarily produce changes in consumption behavior. Adolescent eating behavior is complex and may be influenced by various factors, including eating habits, family environment, school environment, food availability, and peer influence. Therefore, efforts to improve GGL consumption patterns among adolescents should not focus only on increasing knowledge through nutrition education, but should also be accompanied by environmental support that enables adolescents to apply that knowledge in everyday life.

Association between Attitudes and GGL Consumption Patterns among School Adolescents

The results showed no significant association between attitudes and sugar, salt, and fat consumption patterns among students at MAN 1 Bekasi Regency. For sugar consumption, the p-value was 0.433, with an adequate consumption proportion of 69.6% in the poor-attitude group and 77.8% in the good-attitude group. For salt consumption, the p-value was 0.640, with adequate consumption proportions of 69.6% and 74.6%, respectively. Meanwhile, fat consumption showed a p-value of 0.390, with an adequate consumption proportion of 65.2% in the poor-attitude group and 74.6% in the good-attitude group. These findings indicate that a good attitude is not necessarily translated into more appropriate GGL consumption behavior. This condition can be explained through the Theory of Planned Behavior, which states that attitude is one determinant of behavioral intention, but behavior is also influenced by subjective norms and perceived behavioral control (Ajzen et al., 2020). Thus, a positive attitude toward limiting GGL consumption may not directly result in appropriate consumption behavior if it is not supported by environmental conditions and the ability to implement it.

For sugar consumption, the good-attitude group had a higher proportion of adequate consumption than the poor-attitude group, at 77.8% compared with 69.6%. However, this difference did not indicate a statistically significant association. The results of this study are consistent with the study by (Setyanurlia & Sumarmi et al., 202 C.E.), which also found no significant association between attitudes and the level of Sugar-Sweetened Beverages (SSB) consumption. Similar findings were also reported by (Gedi et al., 2022), showing that some respondents continued to consume sweetened beverages regularly despite having good attitudes and knowledge regarding their health effects. In addition, (Daniel & Triyanti et al., 2023) showed that sugar-consumption patterns among adolescents are influenced not only by individual factors but are also related to product availability and lifestyle in the surrounding environment. These conditions indicate that a positive attitude toward limiting sugar consumption may not be sufficient to change consumption habits when adolescents can still easily obtain high-sugar foods and beverages and live in an environment that supports those habits (Ajzen et al., 2020; Linggarsih et al., 2022). For salt consumption, the proportion of adequate consumption in the good-attitude group was 74.6%, compared with 69.6% in the poor-attitude group.

Although there was a descriptive difference in proportions, the statistical test showed that the difference was not significant. This finding indicates that a good attitude is not always followed by a healthier salt-consumption pattern. Salt-consumption patterns may be influenced by various other factors, such as eating habits, preferences for high-salt foods, family consumption patterns, the environment, and the availability of processed foods high in sodium. Therefore, developing positive attitudes through nutrition education should be accompanied by strengthening a supportive food environment so that students have opportunities and convenience to make lower-salt food choices. This is consistent with the explanation that positive attitudes toward healthy eating patterns remain dependent on the situational factors adolescents face in daily life (Linggarsih et al., 2022).

For fat consumption, the good-attitude group had an adequate consumption proportion of 74.6%, compared with 65.2% in the poor-attitude group. Although descriptively the good-attitude group showed a higher proportion of adequate consumption, statistical testing still showed no significant association, with $p=0.390$. This result is consistent with the study by (Wiranti et al., 2025), which showed that understanding and positive attitudes toward the risks of excessive fat consumption are not always followed by healthy consumption behavior. A similar condition was also found by (Teng et al., 2020), showing that adolescents may have good attitudes toward consuming foods and beverages high in sugar and fat, while their actual consumption practices may still be poor. This discrepancy between attitudes and behavior can be explained through the attitude-behavior gap, namely the gap between what a person believes and what the person actually does. Among adolescents, this condition may be influenced by the appeal of fatty foods, established eating habits, peer influence, and ease of access to high-fat foods in the surrounding environment (Andjani & Nadhiroh et al., 2025).

Overall, the absence of a significant association between attitudes and sugar, salt, and fat consumption patterns indicates that changes in adolescent eating behavior are a complex process. Positive attitudes are an important aspect of developing awareness of healthy eating patterns, but they are not sufficient to ensure their implementation in everyday life. Consumption behavior is also influenced by the family environment, school environment, eating habits, peer influence, and the availability and accessibility of foods high in GGL. Therefore, interventions to improve GGL consumption patterns among adolescents should not focus only on developing positive attitudes through education, but should also be accompanied by the creation of a food environment that supports the implementation of those attitudes. These findings are consistent with the study by (Teng et al., 2020), which showed that good knowledge and attitudes are not always followed by good consumption practices.

CONCLUSIONS AND RECOMMENDATIONS

This study involved 86 Grade XI students at MAN 1 Bekasi Regency with a mean age of 16.93 ± 0.256 years. Most respondents were female (72.1%) and had a daily allowance in the moderate category (91.9%). Most respondents had good nutrition knowledge (70.9%) and good attitudes (73.3%). Based on 14-day SQ-FFQ measurements, most respondents had adequate consumption patterns for sugar (75.6%), salt (73.3%), and fat (72.1%). Bivariate analysis showed no significant association between nutrition knowledge and sugar ($p=0.621$), salt ($p=0.866$), or fat ($p=0.588$) consumption patterns. Likewise, there was no significant association between attitudes and sugar ($p=0.433$), salt ($p=0.640$), or fat ($p=0.390$) consumption patterns. All p -values were above $\alpha=0.05$. Thus, the hypotheses regarding associations between knowledge or attitudes and GGL consumption patterns among students were not supported. These findings indicate that good knowledge and attitudes are not necessarily followed by GGL consumption patterns that comply with health recommendations.

Adolescents are advised not only to rely on the knowledge and attitudes they already have, but also to apply them in their daily eating habits. This can be done by reading nutrition-information labels on packaged foods and limiting the consumption of processed foods and beverages high in sugar, salt, and fat. For health or nutrition professionals, the results of this study indicate the need for educational strategies that are not only oriented toward increasing knowledge but are also directed toward behavior change. Approaches that can be considered include nutrition counseling, involving parents and the surrounding environment, and using social media that is appropriate to adolescents' characteristics and daily lives.

For future researchers, studies can be developed by including other variables that may be associated with GGL consumption patterns among adolescents, such as family parenting patterns, peer influence, food availability, and the influence of social media and advertising. Future studies are also advised to use larger sample sizes, broader study areas, and research designs capable of providing a clearer picture of causal relationships so that the findings can be generalized more effectively.

REFERENCES

- Agrina, M (2023). Hubungan Pemberian Uang Saku, Konsumsi Makanan Dan Aktivitas Fisik Dengan Kejadian Gizi Lebih Pada Siswa Di Smp Negeri 1 Getasan Salatiga [Skripsi, Universitas Islam Negeri Walisongo Semarang]
- Ajzen, I (2020). The Theory Of Planned Of Behaviour : Frequently Asked Questions. *Humans Behaviour And Emerging Technologies*, 2(4), 314-324
- Amalia, F. (2024). Profil Pola Makan Gula, Garam, Lemak, Dan Aktivitas Fisik Dengan Status Gizi Siswi Kelas Xi Sman 12 Kota Bekasi
- Amrinanto, A. H., Putra, M. G. S., Djati, L. W. L., & Rahayu, P. D. (2025). Edukasi Pembatasan Konsumsi Gula Garam Lemak Pada Remaja Di Smk Kusuma Wardhana Kota Bogor. *Jurnal Pengabdian Gizi Dan Kesehatan Masyarakat Indonesia*, 3(1), 162–168.
- 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>
- Ardiyanti, N., & Diana, R., (2025). Validasi Semi Quantitative-Food Frequency Questionnaire Terhadap Estimated Food Record Untuk Menilai Konsumsi Total Buah Dan Sayur Pada Mahasiswa. *Jurnal Ilmu Kesehatan Dan Gizi*, 3(2), 227–236. <https://doi.org/10.55606/jig.v3i2.4380>
- Daniel, C., & Triyanti. (2023). Faktor Dominan Yang Berhubungan Dengan Konsumsi Gula Pada Mahasiswa Nonkesehatan. *Jurnal Gizi*, 12(2), 93–106.
- Dwijayanti, I., Utami, D. A., Siahaan, M. F., & Diba, M. F. (2025). Edukasi Pembatasan Asupan Gula, Garam Lemak Dalam Pemilihan Jajanan Remaja. *Harmoni Sosial: Jurnal Pengabdian Dan Solidaritas Masyarakat*, 2(1), 93–100. <https://doi.org/10.62383/Harmoni.V2i1.1119>
- Gedi, S., & Tasyikan, H. A. (2022). Knowledge, Attitude And Consumption Pattern Of Sugar Sweetened Beverages Among Somali Students In Turkey. *Journal Of Basic And Clinical Health Sciences*, 6, 579–588. <https://doi.org/10.30621/jbachs.861149>
- Ismail, , S. A. (2022). Hubungan Tingkat Pengetahuan Dan Sikap Terhadap Konsumsi Gula, Garam, Lemak Dengan Konsumsi Gula, Garam, Lemak Pada Mahasiswa Sarjana Terapan Gizi [Skripsi Politeknik Kesehatan Kementerian Kesehatan Jakarta II].
- Kementerian Kesehatan Republik Indonesia. (2013). Peraturan Menteri Kesehatan Republik Indonesia Tentang Pencantuman Informasi Kandungan Gula, Garam, Dan Lemak Serta Pesan Kesehatan Untuk Pangan Olahan Dan Pangan Siap Saji. Kementerian Kesehatan RI.
- Kementerian Kesehatan Republik Indonesia. (2018). Laporan Nasional Riskesdas 2018. Badan Penelitian Dan Pengembangan Kesehatan.
- Kementerian Kesehatan Republik Indonesia. (2022). Pedoman Gizi Seimbang Untuk Remaja. Kementerian Kesehatan RI.
- Linggarsih, H. D., Jumiyati, & Wahyudi, A. (2022). Survei Pengetahuan, Sikap Dan Pola Makan Remaja Pengguna Media Sosial Di Sman Kota Bengkulu. *Jurnal Kesehatan*.

- Masri E., Nasution, N. S., & Ahriyasna, R. (2022). Literasi Gizi Dan Konsumsi Gula, Garam, Lemak Pada Remaja Di Kota Padang. *Jurnal Kesehatan*, 10(1), 23–30. <https://doi.org/10.25047/J-Kes.V10i1>
- Maziyah, D. S., Nugroho, T. W., Tsani, A. F. A., & Dieny, F. F. (2023). Konsumsi Jajanan Kaitannya Dengan Asupan Gula, Garam, Lemak Pada Remaja Jepara Selama Pandemi Covid-19. *Journal Of Nutrition College*, 12(2), 113–120. <https://doi.org/10.14710/Jnc.V12i2.35679>
- Mokodompit, H. K. N., Akbar, H., Manika, H. S. L., Turang, R., Amboy, A. S. R., Mamonto, A. A., Widodo, F. M. N. A., Mamonto, F. A., Mamonto, N., & Da'aliuwa, Z. (2025). Edukasi Gizi Seimbang Untuk Kesehatan Reproduksi Remaja : Membangun Generasi Sehat Di Usia Dini. *Jurnal Pengabdian Masyarakat Bhinneka*, 4(2), 1669–1675. <https://doi.org/10.58266/Jpmb.V4i2.657>
- Prasetya, G., Sartika, A. N., Sari, A. E., Fadhilah, T. M., & Alamsyah, P. R. (2023). Edukasi Gizi Seimbang Dan Penilaian Status Gizi Pada Remaja Sma / Smk Di Kota / Kabupaten Bekasi Oleh Ketidakseimbangan Antara Asupan Gizi Yang Masuk Dengan Pengeluaran Energi . Kategori Sangat Sering. *Jurnal Mitra Masyarakat*, 4(1), 7–14.
- Rahman, J., Fatmawati, I., Syah, M. N. H., & Sufyan, D. L. (2021). Hubungan Peer Group Support, Uang Saku Dan Pola Konsumsi Pangan Dengan Status Gizi Lebih Pada Remaja. *Action: Aceh Nutrition Journal*, 6(1), 65. <https://doi.org/10.30867/Action.V6i1.391>
- Setyanurlia, A. R., & Sumarmi, S. (2024). The Correlation Between Knowledge And Attitude Towards Sugar-Sweetened Beverages Consumption Among Productive Aged Women. *Media Gizi Kesmas*, 13(1), 67–74. <https://doi.org/10.20473/Mgk.V13i1.2024.67-74>
- Shabrina, K., Mulyani, S., Perdana, M., Studi Ilmu Keperawatan, P., Kedokteran, F., Masyarakat, K., Keperawatan, Dan, Gajah Mada, U., Keperawatan Jiwa Dan Komunitas, D., & Keperawatan Medikal Bedah, D. (2019). Pengaruh Pendidikan Kesehatan Audiovisual Terhadap Konsumsi Natrium Pada Populasi Dengan Risiko Tinggi Sindrom Metabolik Di Puskesmas Turi The Effect Of Audiovisual Health Education On Natrium Consumption In Population With Metabolic Syndrome High-Risk In. 3(2), 55281.
- Swari, A. P., Nur Hatijah, Pengge, N. M., & Buanasita, A. (2023). Correlation Level Of Energy Consumption Level Of Protein And Body Image Prevalency Ced In Shafta High School Surabaya. *Journal Of Nutrition Explorations*, 1(3), 127–137. <https://doi.org/10.36568/Jone.V1i3.252>
- Tamehi, V. G., Malonda, N. S. H., & Sanggelorang, Y. (2024). Pengetahuan Gizi Dan Pola Makan Pada Siswa Sma Di Kabupaten Morowali Utara. *Jurnal Dunia Kesmas*, 13(1), 52–59.
- Teng, N. I. M. F., Juliana, N., Izlin, N. L., & Semaon, N. Z. (2020). Knowledge, Attitude And Practices Of Sugar-Sweetened Beverages: A Cross-Sectional Study Among Adolescents In Selangor, Malaysia. *Nutrients*, 12(12), 3617. <https://doi.org/10.3390/Nu12123617>
- Thakur, S., & Mathur, P. (2022). Nutrition Knowledge And Its Relation With Dietary Behaviour In Children And Adolescents: A Systematic Review. *International Journal Of Adolescent Medicine And Health*, 34(6), 381–392. <https://doi.org/10.1515/Ijamh-2020-0192>
- Utami, A. A. (2023). Efektivitas Metode Emo-Demo Terhadap Pengetahuan Dan Sikap Konsumsi Ggl (Gula, Garam, Lemak) Remaja Smpn 18 Padang [Skripsi, Politeknik Kesehatan Kemenkes Padang].
- Who. (2025). Guidance For Countries To Assess Adolescent Health And Well-Being. *Adolescent Health And Well Being*. https://www.who.int/publications/I/Item/9789240107847?Utm_Source=

- Wiranti, , T. R., Hasibuan, J. M. K., Sitindaon, A. P. R., Rahmadhani, N., A. T., M. R., & Davira, M. (2025). Sikap Dan Perilaku Mahasiswa Terhadap Konsumsi Lemak Dalam Pola Makan Sehari-Hari. *Medic Nutricia: Jurnal Ilmu Kesehatan*, 16(4).
- Yugharyanti, T. P., Fatimah, S., & Rahfiludin, M. Z. (2024). Alasan Pemilihan Makanan, Akses Pembelian Makanan, Dan Kualitas Diet Pada Mahasiswa. *Journal Of Nutrition College*, 13(1), 17–28.
- Yunita, U. R., Khusun, H., & Witjaksono, F. (2024). The Association Between Knowledge And Attitude Towards Nutrition Fact Panels (Nfp) With Sugar Intake Of The Indonesian Adolescents. *World Nutrition Journal*, 7(12), 54–64. <https://doi.org/10.25220/Wnj.V07.I2.0008>