

## Knowledge of Gastritis and Dietary Patterns Among Female Senior High School Students

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### ABSTRACT

**Introduction:** Gastritis is an inflammation of the gastric mucosa that frequently occurs among female adolescents due to unhealthy dietary patterns such as irregular eating schedules, frequent consumption of irritating foods, and low awareness about digestive health. Knowledge plays an important role in shaping eating behaviors, yet many adolescents tend to underestimate the risk factors of gastritis. This research aims to examine the correlation among knowledge about gastritis with dietary patterns among female senior high school students.

**Methods:** A correlational design with a cross-sectional approach was used in this research. The population is all 116 eleventh-grade female students of Public Vocational High School Malang City, and was selected using total sampling. Data collection used a knowledge questionnaire and a dietary questionnaire. Chi square test is used in data analysis.

**Results:** The finding of this research indicated that majority of respondents had adequate knowledge (61.2%), while 14.7% had good knowledge and 24.1% had poor knowledge. Most respondents (41.4%) had poor dietary habits. Statistical tests showed a p-value of 0.001, indicating a significantly correlation among knowledge levels about gastritis and dietary habits.

**Conclusions:** Nurses should design intervention to improve gastritis knowledge to help promote healthier eating behaviors to prevent gastritis.

## Introduction

Gastritis is a digestive disorder characterized by inflammation of the stomach lining, which can be acute or chronic (Li et al., 2020). Although often considered a minor condition, gastritis can actually cause serious consequences if not treated properly, such as stomach ulcers, gastrointestinal bleeding, and even the risk of stomach cancer (Qin et al., 2024). Globally, the prevalence of gastritis remains high, ranging between 20–40%, with millions of new cases each year (Silwal et al., 2021). This condition indicates that gastritis is not only a clinical problem but also a public health issue that requires serious attention.

Adolescence is a critical stage of development characterized by rapid physical, psychological, and social changes. Adolescent girls, in particular, often face pressures related to body image and dietary control, which can lead to unhealthy eating behaviors such as strict dieting or frequent consumption of processed foods. These behaviors increase vulnerability to gastritis, as irregular eating schedules and irritating food choices disrupt the protection of the stomach lining and increase acid secretion (Li et al., 2020). Thus, adolescence is a vulnerable period during which preventive education is very important. Those habits can increase the risk



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of developing gastritis and other digestive disorders, making adolescence a critical phase for health education interventions (Simbolon Pomarida & Simbolon Nagoklan, 2022).

Based on a 2020 report by the WHO health research institute, there are a number of countries in the world with high rates of gastritis: the United Kingdom (22%), China (31%), Japan (14.5%), Canada (35%), and France (29.5%). The incidence of gastritis in Shanghai confirmed by endoscopy is around 13.1%. This figure is 1% higher than that of Western populations (Hadi Pratama et al., 2022). Globally, between 1.8 and 2.1 million people suffer from gastritis each year. Approximately 583,635 people in Southeast Asia experience gastritis annually. According to the 2020 global burden of disease, gastritis can occur in adolescents to the elderly, with the highest prevalence in the 20-45 age group at 22%, the 14-19 age group at 15%, and the 46-64 age group at 10. In Indonesia, gastritis remains a health problem with a fairly high prevalence. Data shows that the incidence of gastritis reaches 40.8%, with East Java being one of the regions with notable cases (Dedi Irawan, 2024). The city of Malang itself reports thousands of gastritis cases every year, underscoring the need for special attention to school-aged groups (Harun et al., 2023). Initial observations at Vocational High School 11 in Malang City, also indicate that many female students experience symptoms of gastritis related to unhealthy eating patterns, such as skipping meals, consuming spicy foods, and irregular eating schedules. This shows that the issue of gastritis in adolescents is not only a global phenomenon but also occurs locally.

Knowledge about gastritis and nutrition plays an important role in shaping teenagers' eating behaviors (Syiffatulhaya et al., 2023). Adolescents with low knowledge tend to neglect healthy eating patterns, whereas those with sufficient knowledge are better able to manage their food intake properly. (Arianto & Aminah, 2024). Health education has been proven to increase knowledge and reduce risky behaviors, making knowledge a key factor in the prevention of gastritis. (Kumala & Salma, 2024). However, although sufficient knowledge is associated with good eating patterns, this condition is not always found in all adolescents, indicating variations in how knowledge is applied to daily eating behaviors. This situation highlights the importance of examining the relationship between knowledge about gastritis and dietary patterns among adolescents. Therefore, increasing knowledge not only strengthens understanding but also supports the maintenance of healthy eating behaviors to reduce the risk of gastritis.

Several previous research have examined the correlation among knowledge with eating patterns, but most were conducted in different cultural contexts or on university students (Silwal et al., 2021). Research that specifically focuses on teenage girls in vocational high schools in Indonesia is still limited, even though this group faces unique challenges such as a busy study schedule, limited access to nutritional information, and the influence of the social environment (Zebua et al., 2023). The gap in this research highlights the need for local studies to understand the relationship between knowledge and eating patterns in adolescent girls (Dewi Melati Anjani et al., 2023).

Knowledge about gastritis plays a significant role in shaping eating behaviors among adolescents. Various studies reveal that unhealthy eating habits, such as frequently consuming spicy and instant foods and irregular meal times, contribute to an increase in the incidence of gastritis among students. (Rahman et al., 2022). In addition, psychological conditions such as stress can further increase the risk of gastritis, especially when accompanied by irregular eating patterns and a lack of understanding about preventive measures (Suralaga & Usman, 2025). The findings indicate a close relationship between adolescents' knowledge of gastritis and their eating behaviors, which can be used as a basis for developing health education programs in schools to encourage healthy eating habits and prevent gastritis.



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Based on this background, this research aims to test the correlation of the level of knowledge about gastritis with eating patterns among class XI female students at SMK Negeri 11 Malang. The main objective of this research is to identify the extent to which knowledge influences eating behavior, so that the results can be used as a basis for health education programs in schools. This study is expected to provide theoretical benefits in the form of strengthening the concept of medical-surgical nursing related to gastritis prevention, as well as practical benefits for the community, educational institutions, and health workers in designing more effective nutritional interventions. Ultimately, it is hoped that the findings of this study will be able to contribute to contribute to gastritis prevention strategies, improve the quality of adolescent health, nor support the creation of a healthier and more productive younger generation (Citra et al., 2022).

## Methods

The quantitative design with a cross-sectional approach was used in this research, aims to examine the correlation of the level of knowledge about gastritis and eating patterns in adolescent girls. This design was chosen because it can describe conditions at a specific point in time and is suitable for analyzing the relationship between variables (Kusumawaty et al., 2022).

A generalization area consisting of subjects and objects that have certain quantities or characteristics determined by researchers for research is called population, from which conclusions are then drawn. A population includes not only humans, but also objects and other natural entities. A population is also not just a number, but includes all the characteristics or properties possessed by these subjects or objects. The research population consists of all 116 female students majoring in nursing in grade 11 at Vocational High School 11 in Malang. Total sampling was used in the sampling techniques, so that the entire population is used as the research sample. Thus, this study has a comprehensive coverage of the target group (Adiputra et al., 2021).

Data collection was conducted using a questionnaire that had been developed and examine validity or reliability. Gastritis knowledge questionnaire contains questions regarding the definition, risk factors, symptoms, and prevention of gastritis. The validity tested utilizes Pearson Product Moment, while the reliability measurement utilizes Cronbach's Alpha at a value of 0.761(Rika, 2016). Eating pattern questionnaire contains questions about meal frequency, types of food consumed, and daily eating habits. This instrument was also examine for validity nor reliability, with values ranging from 0.571-0.895. Reliability measurement was conducted using computer software with a Cronbach's alpha formula  $> 0.60$ . From the validity test results, an alpha of 0.761 was obtained for knowledge statements, and the reliability test results for the already valid dietary pattern questionnaire showed an alpha value of 0.956 (Bulolo, 2022). This study indicates that the questionnaire is suitable for use or already reliable.

Research data were collected directly from primary sources in the field using a questionnaire filling technique. At this stage, the researcher first provided informed consent to prospective respondents as a form of agreement to participate in the study. Next, the questionnaire was prepared in the form of a Google Form to make it easy for respondents to access and complete. After that, respondents were asked to fill out the questionnaire independently according to the instructions provided, so that the data obtained reflected their knowledge and eating patterns objectively.

In this study, the Chi-Square test was used on the statistical test because the two variables studied were nominal and ordinal. The Chi-Square test utilizes to test the hypothesis of whether there is a significantly correlation among the level of knowledge (independent variable) with eating habits (dependent variable). The finding of Chi-Square test is considered



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significant while the p-value is  $< 0.05$ , interpreted that there is a meaningful correlation among the two variables (Wayudi, 2023).

The following research has been approved by the Ethics Committee of the Faculty of Health Sciences, Dr. Soepraoen Institute of Science and Technology, Malang (No. KEPK-EC/346/XI/2025). Prior to data collection, a thorough explanation of research objectives and procedures as well as the signing of an informed consent form was given to all respondents. Respondents had the full right to refuse or withdraw from participation at any time without consequences, and the confidentiality of their identities was guaranteed by not including their names in the research report. The validity of the research data was maintained through the application of systematic data collection procedures, the direct involvement of researchers in the field, and re-verification of the data before analysis.

## Results

A. This study involved 116 female students with demographic data including willingness to participate as respondents, age, gender, weight, height, and history of gastritis.

**Tabel 1 Frequency distribution characteristics of Female High School Students (n=116)**

Characteristics	Category	Frequency (n)	Percentage (%)
Willing to Be a Respondent	yes	116	100
	no	0	0
Age	17 years old	69	59.5
	16 years old	45	38.8
	15 years old	1	.9
	14 years old	1	.9
Body weight	<40	15	12.9
	41-60	92	79.3
	>61	9	7.8
Height	135-155	69	59.5
	156-175	47	40.5
Gender	Female	116	100.0
	Male	0	0
Have you ever been diagnosed with gastritis?	yes	50	43.3
	no	42	36.2
	Don't know	24	20.7
<b>Total</b>		116	100

As we can observe that from characteristics of the 116 respondents, all (100%) stated their willingness to participate in the study. The most of respondents were 17 years old (59.5%), then 16 years old (38.8%), while those aged 15 and 14 were only 0.9% each. Based on body weight, most respondents had a body weight in the range of 41-60 kg (79.3%), while 12.9% had a body weight <40 kg and 7.8% had a body weight >61 kg. For height, the majority were in the range of 135-155 cm (59.5%), and 40.5% were 156-175 cm. All respondents in this study were female (100%). Regarding the history of gastritis, 43.3% of respondents had been diagnosed with gastritis, 36.2% stated they had never been diagnosed, and 20.7% did not know their diagnosis status.



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## B. Specific data

**Table 2 Frequency distribution of respondents based on the level of knowledge**

Category	Score range	Frequency (n)	Percentage (%)
Good	15-20	17	14.7
Enough	11-14	71	61.2
Lacking	1-10	28	24.1
Total		116	100

As we observe in the table, the results of research on the level of knowledge about gastritis among 11th-grade female students at Vocational High School 11 in Malang City. It was found that out of a total of 116 respondents, the majority fell into the moderate knowledge category, with 71 respondents (61.2%). Some others were in the good category, with 17 respondents (14.7%), while the remaining 28 respondents (24.1%) were in the low knowledge category.

**C. Table 3 Frequency distribution of respondents based on eating patterns**

Category	Score range	Frequency (n)	Percentage (%)
Good	0-8	68	58.6
Bad	9-17	48	41.4
Total		116	100

Table 3 shows the results of research on eating patterns among female eleventh-grade students at Vocational High School 11 in Malang City. It is known that out of a total of 116 respondents, the most have good eating patterns, totaling 68 respondents (58.6%). Meanwhile, 48 respondents (41.4%) fall into the category of poor eating patterns.

**D. Table 4 Cross-tabulation of the Relationship between Gastritis Knowledge Level and Eating Patterns**

Level of knowledge	Eating Pattern						P Value	
	Good		Bad		Total			
	F	%	F	%	F	%		
Good	4	3.4	13	11.2	17	14.7		
Enough	49	42.2	22	19.0	71	61.2	0.001	
Less	15	12.9	13	11.2	28	24.1		
Total	68	58.6	48	41.4	116	100.0		

As we observe in the table, the finding of cross-tabulation among the level of knowledge about gastritis and eating patterns among adolescent girls. It can be seen that respondents with good knowledge mostly had poor eating patterns, totaling 13 respondents (11.2%), while those with good eating patterns were only 4 respondents (3.4%). In the average knowledge category, most respondents had good eating patterns, totaling 49 respondents (42.2%), whereas 22 respondents (19.0%) had poor eating patterns. Meanwhile, in the low knowledge category, the number of respondents with good and poor eating patterns was relatively balanced, with 15 respondents (12.9%) and 13 respondents (11.2%), respectively.

**E. Tabel 5 Chi-Square Test**



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	<b>Value</b>	<b>df</b>	<b>Asymptotic Significance (2-sided)</b>
<b>Pearson Chi-Square</b>	13.220 <sup>a</sup>	2	.001
<b>Likelihood Ratio</b>	13.476	2	.001
<b>Linear-by-Linear Association</b>	.691	1	.406
<b>N of Valid Cases</b>	116		

Referring to the findings of the Chi-Square test, it indicated that the Pearson Chi-Square score is 13.220 with  $df = 2$  and a significance score of  $p = 0.001$ , which is less than 0.05. Thus, it can be concluded that there is a significantly correlation among the two variables studied. This finding is reinforced by a Likelihood Ratio value of 13.476 with the same significance score ( $p = 0.001$ ), ensuring that the relationship result is consistent. In addition, the output results show that there are no cells with an expected count less than 5, which means the assumptions for the Chi-Square test are met, so the analysis results can be considered reliable. Meanwhile, the Linear-by-Linear Association score of 0.691 with  $p = 0.406$  shown that there is no linear correlation among the categories, but this does not change the main conclusion that, overall, there is a meaningful correlation among the research variables.

## Discussion

### 1. Knowledge of Gastritis

This research shows that most respondents have moderate knowledge about gastritis (61.2%), with only 14.7% having good knowledge and 24.1% having poor knowledge. This condition indicates that adolescent girls' understanding of the risk factors, symptoms, and prevention of gastritis is still limited, in line with research in Nepal which found that late adolescents have low knowledge about gastritis (Silwal et al., 2021). According to the Health Belief Model, knowledge is an internal factor that influences risk perception and health behavior, whereby individuals with good knowledge are more aware of the consequences of disease and more motivated to take preventive measures (Qin et al., 2024). These findings are in line with (Ambarwati & Habsari, 2023) who stated that adolescents often only understand the general description of gastritis without knowing important aspects related to prevention, so that improving health literacy through formal education and social media is necessary to deepen adolescents' understanding.

### 2. Dietary Patterns Among Adolescents

A total of 41.4% of respondents had poor eating habits, such as skipping breakfast, consuming spicy foods, and eating fast food, while 58.6% had good eating habits. School environment factors, viral food trends, and peer influence were found to affect adolescents' eating habits, as confirmed by (Hadi Pratama et al., 2022) that adolescents' eating habits are greatly influenced by their social environment and popular food trends. Health behavior theory explains that eating habits are influenced by a combination of internal factors (knowledge, motivation) and external factors (environment, social, cultural), where (Simbolon Pomarida & Simbolon Nagoklan, 2022) emphasize that adolescent health behavior is not only determined by knowledge but also by social norms and peer pressure. Although the majority of respondents had good eating patterns, the high rate of poor eating patterns indicates a gap between knowledge and practice, so health education interventions must consider environmental factors



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and adolescent social habits, not just knowledge aspects (Yuliarsih, 2022). This gap confirms that adequate knowledge alone is not enough to ensure healthy eating behaviors in adolescents, as external factors such as peer pressure and food trends have a very strong influence. Therefore, effective health promotion needs to integrate social-based strategies with nutrition education, so that interventions not only increase knowledge but also shape supportive social environments and norms. This integrated approach is believed to be more effective in promoting sustainable behavioral change in adolescent eating patterns.

### **3. The Relationship Between Knowledge of Gastritis and Dietary Patterns Among Adolescents**

The Chi-Square analysis shows a significant correlation among the level of knowledge about gastritis and eating patterns ( $p = 0.001$ ), but the distribution of data shows a knowledge-behavior gap, where good knowledge is not always reflected in healthy eating patterns. For example, some respondents with good knowledge still have poor eating habits, in line with the research by (Arianto & Aminah, 2024) which found that even though adolescents have knowledge about gastritis, their eating behavior is still influenced by external factors such as the environment and social habits. According to social health behavior theory, adolescents' eating behaviors are not only determined by knowledge but also by social norms, taste preferences, and peer pressure, as emphasized by (Qin et al., 2024) that adolescents are more often influenced by food trends and social habits than health considerations. These findings indicate that increasing knowledge alone is insufficient to change adolescents' eating behaviors, necessitating a comprehensive approach involving structured health education in schools, accompanied by a supportive environment conducive to forming healthy eating habits, as suggested by (Kumala & Salma, 2024). This study confirms that knowledge is an important foundation, but not a determining factor in shaping adolescent eating behaviors. Findings that show a gap between knowledge and practice provide clear evidence that health promotion cannot focus solely on cognitive aspects. The results of this study provide a strong basis for the development of adolescent health programs that integrate nutrition education with environmental and social strategies, thereby enabling more comprehensive and sustainable behavioral change. Thus, this study contributes significantly to providing a scientific basis for the design of more effective school- and community-based interventions to bridge the gap between knowledge and adolescent eating behaviors.

### **Conclusion**

This research shows a significant relationship among adolescent girls' knowledge of gastritis and their eating patterns. Lack of understanding of the risk factors and preventive measures for gastritis contributes to unhealthy eating habits, thereby increasing the potential for gastrointestinal problems from an early age. These findings emphasize the importance of targeted health education to encourage better eating behaviors in adolescents, and are relevant to clinical practice and public health programs. Furthermore, the finding of this research are in line with international research in Nepal, China, and India that highlight that gastritis in adolescents is a global problem influenced by socioeconomic, cultural, and behavioral factors (Silwal et al., 2021), (Qin et al., 2024), (Nagireddi et al., 2023). Therefore, further research is recommended to involve a broader population, including male adolescents and groups with different socioeconomic backgrounds, and to use longitudinal designs and school-based interventions to assess the impact of increased knowledge on dietary changes and the effectiveness of nutrition education programs in reducing the risk of gastritis in adolescents globally.



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## Ethics approval and consent to participate

The following research has been approved by the Health Research Ethics Committee of ITSK RS dr. Soepraoen Kesdam V/BRW Malang through decision letter No. KEPK-EC/346/XI/2025. All research procedures were carried out in accordance with the principles of the Helsinki Declaration concerning research involving human subjects. Before data collection, the researchers obtained official permission from Vocational High School 11 in Malang City as well as written consent (informed consent) from all respondents and their parents or guardian. Respondents were given explanations regarding the purpose of the study, its benefits, and their right to refuse or withdraw from participation at any time without negative consequences. The confidentiality of respondents' identities and personal data is fully guaranteed by the researchers.

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