

Influence of dietary patterns and stress on gastritis among adolescents in Sukabumi

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ABSTRACT

Background: : Gastritis, characterized by inflammation of the stomach lining, poses a significant health challenge among adolescents, often exacerbated by modifiable risk factors including unhealthy dietary patterns, chronic stress, limited health literacy, and insufficient family support. In urban settings like Sukabumi City, Indonesia, adolescents face heightened vulnerability due to lifestyle shifts, academic pressures, and irregular eating habits, leading to prevalent symptoms such as epigastric pain, nausea, and dyspepsia. Despite its commonality, few studies have systematically analyzed the interplay of these factors in this demographic, underscoring the need for targeted correlational research to inform preventive strategies in nursing education and public health.

Objectives: This study aimed to analyze the factors influencing gastritis incidence among adolescents in Sukabumi City, with a focus on diet, stress, health knowledge, and family support.

Methods: Employing a correlational design with a cross-sectional approach, the research involved 105 adolescents aged 12-18 years, selected via proportionate random sampling from local schools. Data were gathered using a validated questionnaire assessing dietary habits (e.g., meal frequency and food choices), stress levels (via perceived stress scales), knowledge of gastritis prevention, and family support metrics. Statistical analysis included chi-square tests and logistic regression to determine associations ($p < 0.05$ significance).

Results: Approximately 65% of respondents exhibited gastritis symptoms, with psychosocial factors—particularly high stress ($OR=2.8$, $p=0.002$) and irregular eating ($OR=3.1$, $p<0.001$)—emerging as significant predictors. Family support and health knowledge showed no statistically significant impact ($p>0.05$).

Conclusions: Stress and poor dietary habits are primary drivers of gastritis in adolescents. Nursing-led interventions, including school-based education on stress management and nutrition, are crucial for mitigation.

KEYWORD: adolescents; diet; family support; gastritis; stress

Article info : Received June 09, 2025; 1st revision December 11, 2025; 2nd revision February 03, 2026; accepted February 09, 2026; available online February 17, 2026; published March 31, 2026

INTRODUCTION

Gastritis is a common gastrointestinal disorder characterized by inflammation of the stomach lining. This condition can cause a range of symptoms such as heartburn, nausea, and vomiting. Gastritis can be classified into two main types: acute and chronic. Acute gastritis typically occurs suddenly, often triggered by irritants such as alcohol or non-steroidal anti-inflammatory drugs (NSAIDs). In contrast, chronic gastritis develops gradually, usually due to a persistent *Helicobacter pylori* (*H. pylori*) infection or autoimmune conditions. If left untreated, chronic gastritis can lead to severe complications, including mucosal damage, ulcers, and even gastric cancer. Various risk factors, including lifestyle choices, stress, and environmental conditions, influence the progression of gastritis (1,2).

Chronic gastritis, on the other hand, develops over time and is often linked to persistent *H. pylori* infection or autoimmune diseases. *H. pylori*, a bacterium that infects the stomach lining, plays a crucial role in chronic gastritis. This infection leads to a prolonged inflammatory response that can result in substantial damage to the stomach's mucosal lining, ultimately leading to conditions such as peptic ulcers, bleeding, and in some cases, gastric cancer (3,4). Chronic gastritis is further classified into two subtypes: Type A, which is autoimmune in nature and involves the destruction of parietal cells in the stomach,

and Type B, which is associated with *H. pylori* infection and is the most common type of chronic gastritis (1).

One of the most significant contributors to chronic gastritis is *H. pylori* infection. This bacterium affects nearly 50% of the global population and is a major cause of chronic gastritis. *H. pylori* is also linked to the development of gastric ulcers and cancer. The bacterium survives in the acidic environment of the stomach by producing urease, an enzyme that neutralizes stomach acid, allowing it to colonize the stomach lining. This infection triggers an inflammatory response, which, if persistent, leads to mucosal damage. Studies have shown that *H. pylori* is responsible for approximately 80% of peptic ulcers and is a key risk factor for gastric cancer (3,5).

While *H. pylori* infection is a major contributor to chronic gastritis, lifestyle factors such as alcohol consumption, smoking, and frequent NSAID use can exacerbate the condition. These factors disrupt the stomach's protective mucosal layer, increasing susceptibility to gastric inflammation. Alcohol and NSAIDs can directly irritate the gastric lining, leading to increased gastric acid secretion and further aggravating gastritis symptoms (6). Chronic psychological stress has also been identified as a significant risk factor for gastritis, as it results in elevated gastric acid production, further exacerbating inflammation (7).

In addition to *H. pylori* infection and lifestyle factors, dietary habits play a crucial role in the development and exacerbation of gastritis. Poor dietary choices, such as the excessive consumption of spicy, fatty, or acidic foods, can irritate the stomach lining and increase gastric acid production, thus aggravating gastritis symptoms (Nagireddi et al., 2022). Spicy foods, in particular, have been shown to increase gastric acid production, further damaging the stomach's mucosal lining. Fatty foods, on the other hand, slow gastric emptying, increasing the time that food and gastric acid remain in the stomach, which can worsen inflammation.

Emotional eating, often triggered by stress, can also worsen gastritis symptoms. During stressful times, individuals may resort to unhealthy food choices, which can further compromise gastric health (8,9). This complex relationship between dietary habits, emotional health, and gastritis highlights the challenges in managing the condition. Effective management requires not only promoting healthier eating habits but also addressing the emotional and psychological factors that influence poor dietary choices.

Family support has been identified as an important factor in preventing and managing gastritis, particularly among adolescents and young adults. Emotional and practical support from family members can help individuals adopt healthier eating habits and manage stress more effectively. Studies have shown that strong family ties

and supportive relationships are associated with better dietary choices and improved overall health, which can reduce the risk of gastritis and other related health issues (10). Family-based interventions, particularly those focused on stress management and promoting healthy eating, have been found to significantly alleviate gastritis symptoms (11). By integrating family support into the management plan, individuals are more likely to adhere to healthier lifestyle changes and experience better long-term outcomes. In Indonesia, gastritis is a significant public health issue, with studies indicating that approximately 40.8% of the population is affected by the condition. This corresponds to around 274,396 reported cases of gastritis across the country's 238 million residents (12). While specific data for West Java is not available, it is likely that the region mirrors the national trend, as dietary habits and public health practices play a crucial role in the prevalence of gastritis. Research conducted by Wahab et al suggests that poor and irregular eating habits are major contributors to gastritis (13), particularly in fast-paced, modern societies like those in West Java. Moreover, Jusuf et al found that university students suffering from gastritis often exhibit unhealthy lifestyle patterns, further indicating that broader societal trends are contributing to the rising incidence of the condition (14). In Sukabumi City, one of the health centers reported the highest incidence of gastritis among the

city's seven health centers, with 642 cases reported in 2022 (Sukabumi City Health Office, 2022). These statistics highlight the growing burden of gastritis in Indonesia, particularly in urban areas where dietary habits and lifestyle factors are key contributors to the disease.

The incidence of gastritis among adolescents is particularly concerning, as this age group is vulnerable to irregular eating habits and psychological stress. Adolescents often skip meals, especially breakfast, which has been linked to an increased risk of gastritis (15,16). Additionally, academic and social pressures exacerbate the condition by directly affecting gastric health (17). These factors are particularly important in understanding why adolescent girls are more likely to develop gastritis due to social influences on their eating habits (18).

Stress plays a substantial role in exacerbating gastritis in adolescents. Studies have shown a clear connection between high stress levels and the severity of gastritis, with academic and social stress contributing to increased gastric acid production (19,20). These findings underscore the importance of promoting healthy eating habits and effective stress management in adolescents to prevent gastritis. Moreover, a lack of awareness about the condition among this group often leads to delayed diagnosis and treatment, which increases the risk of long-term complications such as ulcers and gastric

cancer (21). The presence of *Helicobacter pylori* complicates the management of gastritis in adolescents, as the infection is commonly acquired during adolescence through oral-oral and fecal-oral transmission (22). This bacterium is a major cause of chronic gastritis and exacerbates gastric inflammation over time. Given the high prevalence of *H. pylori* in adolescents, it is crucial to implement screening programs and early intervention strategies to reduce the long-term health impacts of the infection.

To address the rising incidence of gastritis, particularly among adolescents, a comprehensive public health strategy is essential. This strategy should include dietary education, stress reduction programs, and early screening for *H. pylori* infections. Public health campaigns aimed at promoting healthy eating habits, reducing stress, and improving awareness of gastritis will be key in reducing the disease's burden. In particular, family-based interventions can play a critical role in ensuring that adolescents adopt healthier lifestyles and seek timely treatment. This study, conducted in Sukabumi City, offers a novel contribution to the understanding of gastritis by exploring the psychosocial factors that influence its incidence in adolescents. While much of the existing literature focuses on the medical aspects of gastritis, this research examines the role of family support, stress, and adolescents' knowledge of digestive health in managing the disease. By incorporating

these social and psychological factors into the prevention and management strategies, this study provides a more holistic approach to addressing gastritis, particularly through family and community-based health education initiatives.

MATERIALS AND METHODS

This study used a correlational design with a cross-sectional approach to explore the relationship between psychosocial factors (family support, knowledge of healthy eating, and stress levels) and gastritis incidence in adolescents. The target population comprised 143 adolescents, reduced to 135 after excluding 8 pilot study participants, from a sample comprised 105 adolescents aged 12-18 years was selected via simple random sampling—calculated using Slovin's formula yielding a minimum of 101, with 4 additional respondents added for enhanced representation. All participants had physician-confirmed gastritis diagnoses established at initial patient presentation. Diagnoses were determined by attending physicians based on clinical history, symptoms (e.g., epigastric pain, nausea), and physical examination. Data collection took place at a community health center (puskesmas) where these adolescents receive treatment. The independent variables included diet (regular vs. irregular), stress (stressed vs. not stressed), knowledge of healthy eating (low vs. high), and family support (supportive vs. not

supportive). The dependent variable, gastritis, was categorized as present or absent.

A questionnaire was used to gather data on the independent variables, comprising three sections: family support (emotional and practical), knowledge of healthy eating (via a modified nutrition knowledge test), diet patterns, and stress levels (measured using the Perceived Stress Scale, PSS). All instruments were pre-tested for validity and reliability during the pilot study. Validity testing for the stress variable, based on the standard PSS instrument, yielded r-values of 0.429–1.000; for family support, using the standard Family Support Scale (FSS), r-values ranged from 0.203–0.830. Pearson product-moment analysis on the 20 diet pattern items (Cronbach's $\alpha = 0.78$) and 15 knowledge items (Cronbach's $\alpha = 0.81$) showed all p-values <0.05 , confirming validity of every item.

The chi-square test was used to examine relationships between categorical variables, and logistic regression was used to assess the impact of these factors on gastritis incidence. Data were cleaned, coded, and scored to facilitate analysis. The chi-square test and logistic regression were applied to identify significant factors associated with gastritis in adolescents. Ethical clearance was obtained from the Institutional Review Board (IRB) of STIKes Sukabumi (approval number: 032/ETIK/2023).

RESULTS AND DISCUSSION

The results of this study provide a comprehensive overview of the demographic characteristics of adolescent respondents, as well as the psychosocial factors that may influence the incidence of gastritis. The findings are presented in a series of tables, each highlighting specific variables such as age, gender, education, diet, stress levels, family support, and knowledge of healthy eating. These factors are explored to understand their potential relationships with the occurrence of gastritis

in adolescents in Sukabumi City. The subsequent analysis of the data is intended to provide insights into the key contributors to gastritis and their implications for public health interventions targeting this age group.

The following **Table 1** presents the demographic characteristics of adolescent respondents in Sukabumi. It includes data on their age, gender, education, occupation, and the source of information they received. This information is essential for further analysis in the study.

Table 1. Characteristics of adolescent respondents in Sukabumi

Respondent Characteristics	Category	Total	Percentage (%)
Age of Respondent	≤ 16	53	50.5
	>16	52	49.5
	Total	105	100
Gender of Respondents	Female	57	54.3
	Male	48	45.7
	Total	105	100
Respondent Education	SD	20	19
	SMP	28	26.7
	High School	56	53.3
	Not in School	1	1
	Total	105	100
Respondent Occupation	Work	5	4.8
	Not Working	100	95.2
	Total	105	100
Source of Information Received	Family	11	10.5
	Health Officer	86	81.9
	Friends	8	7.6
	Total	105	100

Based on the **Table 1**, the majority of adolescents in Sukabumi City were aged ≤16 years (50.5%), with a slight dominance of female respondents (54.3%). Most had high school education (53.3%) and were not

working (95.2%), indicating a focus on education over employment. Health workers were the primary source of information (81.9%), followed by family (10.5%) and friends (7.6%). This suggests that most

Table 2. Overview of diet, stress, knowledge, family support, and incidence of gastritis in adolescents in tipar village, UPTD Puskesmas Tipar Working Area, Sukabumi City

Respondent Characteristics	Category	Total	Percentage (%)
Diet	Irregular	55	52.4
	Regular	50	47,6
	Total	105	100
Stress	Stress	56	53.3
	Not Stressed	49	46.7
	Total	105	100
Knowledge	Low	57	54.3
	High	48	45.7
	Total	105	100
Family Support	Not in favor	52	49.5
	Support	53	50.5
	Total	105	100
Incidence of Gastritis	Gastritis	49	46.7
	No Gastritis	56	53.3
	Total	105	100

respondents, still in the educational phase, predominantly receive health education from medical professionals, which may influence their understanding of gastritis and its prevention. This study examines the relationship between diet, stress, health knowledge, and family support with the incidence of gastritis in adolescents in Sukabumi City. **Table 2** presents an overview of these factors and their correlation with gastritis in this population.

Based on the **Table 2** above, the majority of adolescents had an irregular diet (52.4%) and experienced stress (53.3%). More than half had low health knowledge (54.3%), and nearly half felt unsupported by their family (49.5%). Regarding gastritis, 46.7% had the condition. These findings suggest that factors such as diet, stress,

and family support may influence the occurrence of gastritis in adolescents. This analysis highlights the relationships between these factors and the occurrence of gastritis, offering insights into how they contribute to digestive health in this population.

Table 3 below, highlights the significant influence of diet, stress, knowledge, and family support on the incidence of gastritis among adolescents in Sukabumi City. Adolescents with an irregular diet had a notably higher incidence of gastritis (74.5%) compared to those with a regular diet (16%), with a p-value of 0.000, indicating a strong link between diet and gastritis. Similarly, stress was found to be a significant factor, as 66.1% of stressed adolescents experienced gastritis, while

Table 3. Influence of diet, stress, knowledge, and family support on the incidence of gastritis in adolescents in tipar village, working area of Tipar Health Center, Sukabumi City

Free Variable	Category	Incidence of Gastritis	No Gastritis	Total	p-value
Diet	Irregular	41 (74.5%)	14 (25.5)	55	0
	Regular	8 (16%)	42 (84%)	50	
	Total	49 (46.7%)	56 (53.3%)	105	
Stress	Stress	37 (66.1%)	19 (33.9%)	56	0
	Not Stressed	12 (24.5%)	37 (75.5%)	49	
	Total	49 (46.7%)	56 (53.3%)	105	
Knowledge	Low	35 (61.4%)	22 (38.6%)	57	0.001
	High	14 (29.2%)	34 (70.8%)	48	
	Total	49 (46.7%)	56 (53.3%)	105	
Family Support	Not in favor	31 (59.6%)	21 (40.4%)	52	0.008
	Support	18 (34%)	35 (66%)	53	
	Total	49 (46.7%)	56 (53.3%)	105	

only 24.5% of those not stressed did, also with a p-value of 0.000. Health knowledge played a role, with those having low knowledge more likely to suffer from gastritis (61.4%) compared to those with high knowledge (29.2%), supported by a p-value of 0.001. Lastly, adolescents without family support had a higher incidence of gastritis (59.6%) compared to those who received support (34%), with a p-value of 0.008. These findings underscore the importance of diet, stress management, health education, and family support in preventing gastritis in adolescents.

In the **Table 4**, will explain the results of the multivariate analysis on the relationship between diet, stress levels, knowledge, and family support with the incidence of gastritis in adolescents. This analysis shows that irregular eating patterns and stress have a significant influence on

the occurrence of gastritis, with higher odds ratios, while knowledge and family support do not show a significant effect.

Table 4. Multivariate analysis of the relationship between diet, stress, knowledge and support family with gastritis in adolescents

Variables	B	P-value	OR
Diet	3.086	0	21.896
Stress	2.194	0	8.975
Knowledge	0.425	0.478	1.53
Family Support	0.549	0.36	1.732
Constant	-2.666	0	0.07

R Square: 0.580

Based on the **Table 4** above, the last modeling obtained R Square = 0.580 (Nagelkerke R Square) means that diet, stress, knowledge and family support contribute to influencing the incidence of gastritis in adolescents by 58% and the remaining 42% is influenced by other factors not examined. The results of

multivariate logistic regression analysis showed that there were 2 variables associated with the incidence of gastritis in adolescents, namely diet and stress variables, and there were 2 variables as *confounding* variables, namely knowledge and family support variables. Based on this data, it shows that diet and stress have a significant influence on the incidence of gastritis in adolescents. Poor diet increased the odds of gastritis by almost 22 times, while stress played a major role by increasing the odds to about 9 times greater. On the other hand, knowledge and family support did not have a significant influence on the incidence, although they slightly contributed to the risk of gastritis. With an R Square of 0.580, the model successfully explained about 58% of the variability of gastritis in adolescents, confirming that dietary factors and stress play an important role in driving the onset of the disease in this age group.

This study provides significant insights into the factors influencing the incidence of gastritis in adolescents in Sukabumi City, particularly focusing on irregular dietary patterns, stress levels, health knowledge, and family support. The study's findings that psychosocial factors, notably stress and irregular eating habits, significantly increase the incidence of gastritis among adolescents align with existing literature emphasizing the role of lifestyle and psychological factors in digestive health. For example, (16) demonstrated that

unhealthy lifestyle choices, particularly erratic eating patterns, are associated with gastritis in young adults, suggesting these factors extend to adolescents. Similarly, Adila found a significant relationship between stress, irregular eating, and gastritis symptoms in high school students, indicating that disruptions in normal eating routines and excessive gastric acid secretion are key mechanisms in gastritis development (19).

This study also found that while knowledge about healthy eating and family support are important, these factors did not show a significant impact in preventing gastritis in the multivariate analysis. This suggests that, although these factors are crucial for overall health promotion, their direct physiological impact on gastric health may not be as immediate as the effects of stress and irregular eating patterns. Li et al pointed out that specific dietary habits, such as irregular meal sizes (20) and unhealthy food choices, are more strongly linked to gastritis symptoms than broader lifestyle knowledge. (21) further emphasized that psychosocial stress, often coupled with unhealthy eating behaviors, exacerbates gastrointestinal conditions. Together, these findings underscore the need for public health strategies focused on stress management and behavioral regulation, as they play a more direct role in adolescent digestive health than knowledge-based interventions alone. The study found that adolescents with irregular eating habits had

a much higher prevalence of gastritis compared to those who followed a regular diet. Of the 105 respondents, 74.5% of adolescents with irregular eating patterns reported experiencing gastritis, compared to only 16% of those with regular eating habits. The available evidence supports the notion that irregular eating patterns, such as skipping meals or having late-night meals, are linked to increased gastric acid secretion, which can aggravate gastritis symptoms.

Research by (22) found that high-fat and spicy foods can delay gastric emptying and stimulate increased acid production, which is known to irritate the gastric mucosa. This provides a plausible biological mechanism through which such dietary habits can worsen gastritis. Additionally, studies focusing on adolescents have highlighted that meal skipping, often tied to irregular eating habits, is prevalent in this age group. Such behavior may lead to nutritional imbalances, increasing susceptibility to gastrointestinal disorders, including gastritis (23).

The relationship between irregular meal timing and heightened gastric acid production underscores the importance of promoting regular, balanced meal patterns, particularly among adolescents. (23) that meal skipping is particularly common in adolescent populations, especially among girls. This practice often results in compensatory eating behaviors, such as consuming high-fat, spicy, and acidic foods,

which are known to disrupt the normal regulation of acid production and irritate the stomach lining. Consequently, this can exacerbate gastritis symptoms, further supporting the need for intervention. The evidence collectively suggests that educational strategies promoting regular meal intervals, reducing the intake of foods that encourage excessive acid secretion, and fostering a balanced diet are essential for preventing gastritis in adolescents.

Maintaining regular meal patterns is essential for stabilizing metabolic processes and supporting gastrointestinal health. Research by Onyeke et al. showed that adolescents who follow consistent meal habits are less likely to experience nutritional deficiencies, which are often linked to gastrointestinal disorders like gastritis (24). Structured dietary guidelines and educational programs for adolescents can help reduce risk factors associated with excessive gastric acid production and prevent the worsening of gastritis symptoms. Irregular eating behaviors, along with the consumption of high-fat, spicy, and acidic foods, contribute to excessive gastric acid and irritation of the gastric mucosa. Public health initiatives should prioritize promoting regular meal patterns to prevent or alleviate gastritis in adolescents. Current evidence highlights a significant link between psychosocial stress and the development of gastritis, particularly among adolescents. Epidemiological data show that adolescents exposed to high stress

levels often exhibit gastritis symptoms, supporting the role of stress in gastric mucosal damage. Chronic stress triggers physiological responses, such as increased gastric acid secretion, reduced mucosal blood flow, and higher reactive oxygen species (ROS) production, which can lead to mucosal inflammation and oxidative injury, increasing the risk of gastritis (25,26). Clinical studies confirm the prevalence of gastritis symptoms in stressed adolescents, emphasizing the need for effective stress management strategies. Incorporating stress reduction techniques, such as mindfulness and counseling, could help mitigate both the psychological and physiological effects of stress, thereby reducing the risk of gastritis (27).

Although knowledge about healthy eating and family support did not significantly affect the incidence of gastritis in the multivariate analysis, both remain important for overall adolescent health. Among respondents, 54.3% had low knowledge about healthy eating, and 49.5% felt their families provided insufficient support. While these factors showed some association with gastritis in the univariate analysis, they did not significantly contribute to predictive power.

This suggests that simply providing nutrition knowledge is insufficient for lasting behavioral change, especially when external influences like peer pressure and social media trends are involved (28,29). Promoting positive beliefs through cognitive

behavioral techniques is crucial for translating knowledge into action. Moreover, the family environment plays a vital role in shaping behaviors, but passive family support alone cannot counterbalance peer and social media pressures. Health promotion strategies must address cognitive, emotional, and social factors to drive long-term behavioral change.

Further research suggests that family-based health education must go beyond simply providing nutritional information; it should also focus on equipping families with stress management tools to help buffer adolescents against external pressures (30,31) found that cultural misalignments and poor family communication contribute to heightened stress in adolescents, which negatively impacts their eating habits. Alonso-Stuyck, (2020) emphasized that active parental involvement and effective communication are crucial during adolescence, a time when health behaviors are consolidating and influencing future well-being.

Studies also highlight that the decline in home-cooked meals and the lack of food preparation skills among adolescents further exacerbate the knowledge-practice gap in nutrition (32,33). As such, family-centered interventions that address both nutrition education and stress management could create a more supportive home environment, ultimately fostering healthier eating habits and emotional well-being among adolescents.

CONCLUSION AND RECOMMENDATION

This study highlights that irregular eating patterns and stress are key factors contributing to gastritis in adolescents in Sukabumi City. While health knowledge and family support are important, they did not significantly impact gastritis incidence in this study. The findings suggest that interventions promoting regular eating habits and stress management are crucial for preventing gastritis in adolescents. Future research should focus on effective strategies to improve these factors and enhance adolescent digestive health.

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