



Association between Dietary Pattern and Stress Level among Gastritis Patients at a Primary Health Care Center in West Halmahera Regency

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Abstract. Gastritis is a common gastrointestinal disorder that is influenced by both behavioral and psychological factors, including dietary patterns and stress. This study aimed to examine the association between dietary patterns and stress levels among patients with gastritis at a primary healthcare center in West Halmahera Regency. A quantitative analytical study with a cross-sectional design was conducted in November 2025. A total of 60 gastritis patients were recruited using a total sampling technique. Data were collected using structured questionnaires to assess dietary patterns and stress levels. Statistical analysis was performed using SPSS version 26. Descriptive analysis was used to summarize respondents' characteristics, while the Chi-square test or Fisher's exact test was applied to analyze the association between variables. The results showed that most respondents had unhealthy dietary patterns and experienced high stress levels. Dietary pattern was significantly associated with stress level ($p = 0.038$), whereas demographic characteristics were not significantly related to stress level. Patients with unhealthy dietary patterns were more likely to experience high stress. In conclusion, dietary pattern is significantly associated with stress levels among gastritis patients. These findings highlight the importance of promoting healthy eating behaviors as part of stress management strategies in primary health care settings.

Keywords: Cross-Sectional Study; Dietary Pattern; Gastritis; Primary Health Care; Stress Level.

1. INTRODUCTION

Gastritis is an inflammatory condition of the gastric mucosa and submucosa that remains a major public health problem worldwide (Magdalena *et al.*, 2025; Tilla *et al.*, 2024). It affects a large proportion of the population and contributes significantly to morbidity, reduced quality of life, and increased health care utilization (Milivojevic, Vladimir, 2020; Xie *et al.*, 2022). The World Health Organization reports that gastritis prevalence remains high in many countries, including China, Japan, Canada, France, and the United Kingdom (WHO, 2019). In Southeast Asia, gastritis is one of the most frequently diagnosed gastrointestinal disorders in primary health care facilities (Kemenkes RI, 2018).

In Indonesia, gastritis consistently ranks among the top ten most common diseases treated at primary health care centers (Kemenkes RI, 2018). National health statistics indicate that more than 40% of the population experience gastritis symptoms during their lifetime (Al Ta'ani *et al.*, 2024; Li, 2022). The burden of gastritis is particularly evident in community health settings, where patients often present with recurrent symptoms related to lifestyle and psychosocial factors (Madison & Bailey, 2024; Tilla *et al.*, 2024). If not properly managed, gastritis may progress to more severe complications such as peptic ulcer disease, gastrointestinal bleeding, and an increased risk of gastric cancer (Malfertheiner *et al.*, 2022; Salari *et al.*, 2021).

Dietary patterns play a crucial role in maintaining gastric health. Irregular meal timing, skipping meals, and frequent consumption of spicy, acidic, fatty, and processed foods can stimulate excessive gastric acid secretion and damage the gastric mucosal barrier (Tussakinah & Burhan, 2018). These dietary behaviors are commonly observed in working-age adults and populations with limited access to nutritional education (Pitaloka *et al.*, 2024). Psychological stress is another important determinant of gastrointestinal function. Stress activates the hypothalamic pituitary adrenal (HPA) axis and increases cortisol secretion, which can disrupt gastric acid regulation, reduce mucosal blood flow, and impair protective mechanisms of the stomach (Brzozowski *et al.*, 2016; Leigh *et al.*, 2023; Malfertheiner *et al.*, 2022). Prolonged stress not only worsens gastritis symptoms but may also influence eating behavior, leading to unhealthy dietary choices and irregular meal patterns (Black *et al.*, 2020). This interaction suggests a bidirectional relationship between dietary habits and stress, particularly among individuals suffering from gastritis.

Several studies have demonstrated that poor dietary habits and high stress levels are significantly associated with gastritis incidence and recurrence (Pitaloka *et al.*, 2024; Tussakinah & Burhan, 2018). However, most previous research has focused on the occurrence as the primary outcome, rather than examining stress level as an important health outcome among gastritis patients (Nurpratiwi *et al.*, 2025).

Despite growing evidence on the role of lifestyle factors in gastritis, important gaps remain. First, limited studies have explored the association between dietary patterns and stress levels specifically among gastritis patients in primary health care settings (Pitaloka *et al.*, 2024). Stress is a critical factor that affects treatment adherence, symptom perception, and overall quality of life, yet it is rarely examined as a main outcome variable (Sung *et al.*, 2018)

Second, data from rural and remote regions of Indonesia, including West Halmahera Regency, are scarce. Most available studies have been conducted in urban hospitals or academic institutions, which may not accurately represent the sociocultural and behavioral characteristics of patients attending community health centers in eastern Indonesia (Haryanik & Istiaji, 2025; Saputri, 2025). At Duono Primary Health Care Center, gastritis is one of the most frequently reported digestive disorders. However, there is limited local evidence regarding how dietary behavior and stress levels interact among gastritis patients in this setting. Understanding these relationships is essential for designing context-specific interventions aimed at reducing disease burden and improving patient well-being.

Based on the above considerations, this study aimed to analyze the association between dietary patterns and stress levels among gastritis patients at a primary health care center in West

Halmahera, Indonesia, using a cross-sectional design. This study focused on dietary pattern as the main behavioral determinant and stress level as the primary outcome variable. The findings of this study are expected to provide evidence-based information for health care providers and policymakers regarding modifiable lifestyle factors associated with stress among gastritis patients. By identifying dietary patterns as a significant factor related to stress level, this study highlights the importance of integrating nutritional counseling with stress management strategies in gastritis prevention and treatment programs (Malfertheiner *et al.*, 2022).

2. METHODS

Study Design and Setting

This study employed a quantitative analytical design with a cross-sectional approach. The research was conducted at a primary health care center (Puskesmas) in West Halmahera Regency. Data collection was carried out in November 2025. The study was implemented after obtaining formal permission from the respective primary health care center.

Population and Sample

The study population consisted of all gastritis patients who visited the primary health care center during the data collection period. A total of 60 respondents were included in the study. The sample was selected using a total sampling technique, in which all eligible patients meeting the inclusion criteria were recruited as study participants.

Variables and Measurement

The dependent variable in this study was stress level among gastritis patients, which was categorized into low stress and high stress. The independent variables included demographic characteristics (age group, gender, education level, marital status, and employment status) and behavioral characteristics, specifically dietary pattern. Dietary patterns were classified into healthy, moderate, and unhealthy categories based on respondents' reported eating habits.

Data Collection Procedure

Data were collected using structured questionnaires administered directly to respondents. The questionnaire captured information on demographic characteristics, dietary patterns, and stress levels. Data collection was conducted by the researcher with assistance from health staff at the primary health care center to ensure accurate and complete responses.

Data Analysis

The collected data were processed and analyzed using Statistical Package for the Social Sciences (SPSS) version 26. Descriptive analysis was performed to present the frequency and percentage distribution of demographic and behavioral characteristics. Bivariate analysis was

conducted to examine the association between independent variables and stress level. The Chi-square test was used, and Fisher’s exact test was applied when the expected cell count requirements were not met. A p-value of less than 0.05 was considered statistically significant.

Ethical Considerations

This study was conducted after obtaining official permission from the primary health care center (Permit No. 445/456/XI/PKM-D/2025). All respondents were informed about the purpose of the study and provided their informed consent prior to participation. The confidentiality and anonymity of all respondents were strictly maintained throughout the research process.

3. RESULTS

The demographic and behavioral characteristics of gastritis patients are presented in Table 1. Of the 60 participants included in this study, more than half were young adults aged 20–39 years (51.7%), while the remainder were middle-aged adults aged 40–59 years (48.3%). Female patients slightly outnumbered males (55.0% vs. 45.0%). Educational attainment was evenly distributed between low and high education levels. Most respondents were married (83.3%) and employed (51.7%). In terms of behavioral factors, unhealthy dietary patterns were the most frequently reported (40.0%), followed by moderate dietary patterns (36.7%). Additionally, a higher proportion of respondents experienced high stress levels (56.7%) compared to low stress levels (43.3%).

Table 1. Demographic and Behavioral Characteristics of Gastritis Patients at Duono Primary Health Care Center, West Halmahera Regency (n = 60).

Variable	Frequency (n= 60)	Percent (%)
Demographic Characteristic		
Age Group (years)		
Young Adults (20-39)	31	51,7
Middle Aged Adults (40-59)	29	48,3
Gender		
Male	27	45,0
Female	33	55,0
Education Level		
Low Education	30	50,0
High Education	30	50,0
Marital Status		
Married	50	83,3
Not Married	10	16,7
Employment Status		
Employed	31	51,7

Unemployed (Single/Widowed/Divorced)	29	48,3
Behavioral Characteristics		
Dietary Pattern		
Healthy	14	23,3
Moderate	22	36,7
Unhealthy	24	40,0
Stress Level		
Low Stress	26	43,3
High Stress	34	56,7

The association between demographic and behavioral characteristics and stress level is summarized in Table 2. Statistical analysis demonstrated that age group, gender, education level, marital status, and employment status were not significantly associated with stress level ($p > 0.05$). Conversely, dietary pattern showed a significant association with stress level ($p = 0.038$). Patients with unhealthy dietary patterns were more likely to experience high stress compared to those with healthy dietary habits. This finding indicates that dietary behavior is significantly related to stress among gastritis patients, whereas demographic characteristics did not show a meaningful association.

Table 2. Association between Demographic and Behavioral Characteristics and Stress Level among Gastritis Patients at Duono Primary Health Care Center, West Halmahera Regency.

Variable	Stress Level		<i>p-value</i>
	Low Stress n	High Stress n	
Demographic Characteristic			
Age Group (years)			0.768
Young Adults (20-39)	14	17	
Middle Aged Adults (40-59)	12	17	
Gender			0.084
Male	15	12	
Female	11	22	
Education Level			1.000
Low Education	13	17	
High Education	13	17	
Marital Status			0.062
Married	19	31	
Not Married	7	3	
Employment Status			0.063
Employed	17	14	
Unemployed	9	20	
Behavioral Characteristics			
Dietary Pattern			0.038*
Healthy	10	4	
Moderate	9	13	

Unhealthy 7 (11,7) 17 (28,3)

Notes: Statistical analysis was performed using the *Chi-square test* or *Fisher's exact test*. A *p-value* < 0.05 was considered statistically significant.

4. DISCUSSIONS

This study examined the association between demographic and behavioral characteristics and stress levels among gastritis patients at Duono Primary Health Care Center, West Halmahera Regency. The findings demonstrated that dietary pattern was the only variable significantly associated with stress level, whereas age, gender, education level, marital status, and employment status showed no statistically significant relationships. These results highlight the central role of modifiable behavioral factors, particularly diet, in influencing psychological stress among individuals with gastritis.

The significant association between unhealthy dietary patterns and higher stress levels suggests a close interaction between eating behavior and psychological well-being in gastritis patients. Individuals who reported irregular meal timing, frequent consumption of spicy, acidic, and fatty foods, and meal skipping were more likely to experience high stress. This finding aligns with existing evidence indicating that poor dietary habits can exacerbate gastric irritation, leading to persistent symptoms that contribute to psychological distress (Rita & Annica, 2020; Tussakinah & Burhan, 2018). From a physiological perspective, stress activates the hypothalamic pituitary adrenal (HPA) axis, resulting in elevated cortisol levels that disrupt gastric acid regulation, reduce mucosal blood flow, and impair protective mechanisms of the stomach (Brzozowski *et al.*, 2016; Leigh *et al.*, 2023). These mechanisms may explain how unhealthy dietary behavior and stress reinforce one another, creating a vicious cycle that worsens gastritis-related outcomes.

The present findings are consistent with previous studies reporting strong associations between dietary patterns and gastritis-related outcomes. (Pitaloka *et al.*, 2024) found that irregular eating habits were significantly associated with both stress levels and gastritis symptoms among nurses, emphasizing the importance of regular meal patterns and food quality in maintaining gastrointestinal and psychological health. Similarly, (Van Oudenhove *et al.*, 2016) reported that psychological stress exacerbates gastrointestinal symptoms through gut-brain axis dysregulation and influences eating behavior, contributing to irregular meal patterns and unhealthy dietary choices. Collectively, these findings support a bidirectional relationship between dietary habits and stress in gastrointestinal disorders, including gastritis.

In contrast, no significant associations were observed between demographic characteristics and stress level in this study. Although higher proportions of stress were

observed among female participants and those who were unemployed, these differences did not reach statistical significance. This suggests that stress among gastritis patients may be more strongly influenced by behavioral and lifestyle factors rather than sociodemographic background. Similar findings were reported by (Firdausy *et al.*, 2022), who observed that stress related to gastritis occurred across different age groups without a clear demographic pattern. The lack of association with education level may indicate that knowledge alone is insufficient to reduce stress or promote healthy dietary behavior without supportive environmental and behavioral interventions.

Importantly, this study contributes to the existing literature by addressing a notable research gap. While many previous studies have focused on gastritis incidence or recurrence as primary outcomes, this study emphasizes stress level as a key outcome variable among gastritis patients in a primary health care setting. Stress plays a critical role in symptom perception, treatment adherence, and quality of life, yet it is often underexplored in gastritis research (Brzozowski *et al.*, 2016; Leigh *et al.*, 2023). By focusing on stress as an outcome, this study provides a more comprehensive understanding of gastritis as both a physical and psychological condition.

Overall, the findings underscore the importance of integrating dietary counseling with stress management strategies in the management of gastritis at the primary health care level. Addressing unhealthy dietary patterns may not only reduce gastric symptoms but also alleviate psychological stress, thereby improving overall patient well-being. These results are particularly relevant for community health settings in rural and remote areas, such as West Halmahera, where resources are limited and lifestyle-related diseases remain prevalent.

5. CONCLUSIONS

This study investigated the association between demographic and behavioral characteristics and stress level among gastritis patients at Duono Primary Health Care Center, West Halmahera Regency. The findings demonstrate that dietary pattern is the only factor significantly associated with stress level among gastritis patients, whereas demographic characteristics, including age group, gender, education level, marital status, and employment status, showed no statistically significant relationships. Patients with unhealthy dietary patterns were more likely to experience high stress compared with those who maintained healthy eating behaviors. This result highlights the important role of lifestyle factors, particularly dietary habits, in influencing psychological well-being among individuals suffering from gastritis. The coexistence of poor dietary behavior and elevated stress may create a reinforcing cycle that

exacerbates both gastrointestinal symptoms and mental distress. The absence of significant associations between demographic variables and stress level suggests that stress among gastritis patients is not determined primarily by sociodemographic background but rather by modifiable behavioral factors.

These findings emphasize the need for comprehensive gastritis management strategies that integrate nutritional counseling and stress management interventions rather than focusing solely on demographic risk profiling. In conclusion, improving dietary patterns may contribute not only to better gastrointestinal health but also to reduced stress levels among gastritis patients. Health promotion programs in primary health care settings should prioritize education on regular meal timing, balanced nutrition, and avoidance of foods that irritate the gastric mucosa, accompanied by psychological support and stress reduction strategies. Future research using longitudinal designs and larger sample sizes is recommended to further clarify the causal pathways between dietary behavior and stress in gastritis populations and to develop effective, evidence-based interventions.

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