

PREVALENCE AND RISK FACTORS ASSOCIATED WITH GASTRITIS IN PATIENTS VISITING ROYAL PRIMA HOSPITAL

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ABSTRACT

Introduction: Acute or chronic gastritis is an inflammation of the stomach lining caused by *Helicobacter pylori*, a bacterium that causes disease in over 50% of people. If left untreated, it can lead to serious complications.

Objectives: This study aimed to determine prevalence and risk factors of gastritis in patients attending Royal Prima Hospital.

Methods: This study was an analytic observational study with a cross-sectional design conducted on 132 patients who visited Royal Prima Hospital with gastritis complaints. Data were analyzed using univariate, bivariate (chi-square and Fisher), and multivariate analysis (logistic regression).

Results: This study reported a prevalence of gastritis of 64.9%. Associated risk factors were smoking status (OR=2.20, 95% CI, 1.18-4.09); $p=0.014$, coffee drinking (OR=8.26 95% CI, 3.92-17.37; $p<0.001$), diet (OR=12.44, 95% CI, 5.75-26.87; $p<0.001$).

Conclusions: Coffee drinking and diet are determinant factors of gastritis. Educating patients at risk of gastritis by reducing coffee consumption, quitting smoking, improving diet and other factors that can increase gastritis complications are efforts that must be made in preventing the increase in gastritis disease.

Keywords: gastritis, patients, prevalence, risk factors

Introduction

Gastritis is an inflammation of the stomach lining (Feyisa & Woldeamanuel, 2021; Smith et al., 2019). The disease is marked by pain, swelling, and irritation of the stomach lining (Smith et al., 2019). Other signs and symptoms may include nausea, vomiting, dull ache, upper abdominal discomfort, bloating, and loss of appetite. Depending on the duration of the signs and symptoms, Peptic Ulcer disease may be acute or chronic (Feyisa & Woldeamanuel, 2021; Suwindri et al., 2021). An acute ulceration is a sudden inflammation of the stomach lining that lasts a few days to less than a month (Ananthakrishnan & Xavier, 2020). Similarly, a chronic ulcer is an inflammation of the stomach lining that occurs gradually and persists for more than a month or even several years (Sipponen & Maaros, 2015; Yin et al., 2022). Gastritis remains a public health problem in both developed and developing countries (Feyisa & Woldeamanuel, 2021). Globally, 50.8% of the population in developing countries suffer from ulcers (gastritis) (Isabella et al., 2019). At a lower rate, 34.7% of the population in developed countries have ulcer-related health problems (Feyisa & Woldeamanuel, 2021). Based on Indonesian Ministry of Health data, gastritis ranks sixth with 33,580 inpatient cases (60.86%) and seventh among outpatients (201,083 cases). Some areas have a high incidence of gastritis, with 274,396 cases out of 238,452,952 people, or 40.8%. In Indonesian cities, Jakarta 50%, Palembang 35.5%, Bandung 32%, Denpasar 46%, Surabaya 31.2%, Aceh 31.7%, and Pontianak 31.2%. Medan had the highest incidence of gastritis at 91.6% (Kemenkes RI, 2018).

In general, ulcer disease is higher in men than women (Li et al., 2020a). Several previous studies have found that factors such as gender, age, socioeconomic status, biology, environmental factors, and individual behavior significantly contribute to gastritis (Agbor et al., 2018; Bamba et



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al., 2021; Isabella et al., 2019). Based on an initial survey conducted by the researchers, the number of gastritis patients at the Royal Prima General Hospital from January to April was quite high. In addition, most of the patients complained about eating on time and eating a lot after eating late, according to the researcher's observations based on the status of the patients in the medical records. In this regard, there has been no research to identify the factors that contribute to the status of both acute and chronic gastritis at Royal Prima Hospital. It is crucial to determine the prevalence of gastritis in this area in relation to the above factors. This is because there have been no previous studies in the Royal Prima Hospital. Our primary objective is to provide valuable insights into the factors that significantly contribute to the occurrence of gastritis and to disseminate information about the prevalence of gastritis. Therefore, this study aimed to evaluate the prevalence and risk factors of gastritis disease in patients with gastritis complaints attending the Royal Prima Hospital.

Methods

This research used an observational approach to determine the prevalence and factors associated with the incidence of gastritis in patients at Royal Prima Hospital from May to June 2024. The study population included all patients with gastritis complaints, and the sample size was 132. A questionnaire was used to collect data on gastritis. The dependent variable was gastritis status. All patients with gastritis symptoms at the Royal Prima Hospital who consented to the collection of information were included. Children and patients with co-morbidities were excluded. Data were collected using a structured questionnaire. Written informed consent was obtained from each patient prior to data collection.

The independent variables included gender, age, education, occupation, income, smoking status, coffee consumption, and diet, which were measured using a questionnaire that had been tested for validity and reliability on 30 respondents with an r value for each question > 0.239 (r count $> r$ table) and a reliability test value of 0.812. Dietary variables were assessed by 10 questions, namely: eating acidic foods, drinking soda, eating spicy foods, eating large portions in one meal, eating too fast and in a hurry, eating at the wrong time, eating high fiber foods (vegetables, fruits, grains) in a day, skipping breakfast, drinking 2 L of water in a day, not washing hands before eating, good diet was defined by $\geq 75\%$ correct responses. After the data were collected, we analyzed the statistical application. This study began by describing the characteristics of the research data in tabular form. Chi-square test and Fisher's test were used to analyze the relationship between the independent variable and the dependent variable. Bivariate analysis was used to evaluate potential variables that affect the dependent variable. In addition, a multivariate logistic regression model was selected to identify the determinants of gastritis incidence. Variables were considered statistically significant if the p -value was < 0.05 . Odd ratios with 95% confidence intervals were reported for the significance of the predictor variables on the outcome variable in the multivariate logistic regression analysis.

Results

The results of the descriptive analysis of the sample characteristics are shown in Table 1. Of the study participants, 123 (65.4%) were female and 65 (34.6%) were male. The age of the respondents ranged from 18 to 56 years. Half of the study participants, 101 (53.7%) were between 18-28 years old, 65 (36.4%) were between 40-50 years old, while only 15 (8.0%) and 7 (3.7%) were 29-39 years old and over 50 years old, respectively. In addition, 102 (54.3%) respondents had a low level of education and 86 (45.7%) respondents had a high level of education. In terms of income, the distribution is almost uniform. A total of 93 (49.5%) study participants earned \geq UMR and 95 respondents (50.5%) earned $<$ UMR.



Table 1 Respondent Characteristics

Variables	Percentage	
	n	%
Gender		
Male	65	39.6
Female	123	60.4
Age		
18-28 years	101	53.7
29-39 years	15	8.0
40-50 years	65	34.6
>50 years	7	3.7
Education		
SMA	102	54.3
Sarjana/ Sederajat	86	45.7
Occupation		
Not working	84	44.7
Private/factory workers	49	26.1
Governmental	55	29.3
Average monthly income		
< Minimum wage	95	50.5
≥ Minimum wage	93	49.5
Smoking Status		
Yes	89	47.3
No	99	52.7
Drinking coffee		
Yes	87	46.3
No	101	53,7
Food pattern		
Not Good	138	73.4
Good	50	26.6
Gastritis Status		
Yes	122	64.9
No	66	35.1

There were 87 people (44.7%) of the study participants with a non-working status, while 55 people (29.3%) worked in the government sector and 49 people (26.1%) worked in the non-government sector. According to some risk factors for gastritis, which were asked to the respondents, 89 people (47.3%) smoked, 87 people (46.3%) had coffee consumption habits, and 138 people (73.4%) had an unfavorable diet. Based on the diagnosis results obtained from the medical record data of the patients who came to the Royal Prima Medan Skit House, the prevalence of gastritis was quite high, which was about 64.9%.

Table 2. Bivariate Analysis Based on Gastritis Status in Respondents

Variable	Gastritis Status				<i>p-value</i>	<i>Odd ratio (95% CI)</i>
	Yes		No			
	n	%	n	%		



Gender						
Male	30	46.2	35	53.8	<0.001	0.28 (0.15-0.54)
Female	92	74.8	31	25.2		
Education						
Low	61	59.8	41	40.2	0.12	0.61 (0.33-1.12)
High	61	70.9	25	29.1		
Age						
< 40 years	76	65.5	40	34.5	0.876	1.07 (0.58-1.98)
≥ 40 years	45	62.5	27	37.5		
Average monthly income						
< Minimum wage	61	64.2	34	35.8	0.88	1.06 (0.58-1.98)
≥ Minimum wage	61	65.6	32	34.4		
Occupation						
Not Working	54	64.3	30	35.7	0.879	0.95 (0.52-1.74)
Working	68	65.4	36	34.6		
Smoking status						
Yes	66	74.2	23	25.8	0.014	2.20 (1.18-4.09)
No	56	56.6	43	43.4		
Drinking coffee						
Yes	76	87.4	11	12.6	<0.001	8.26 (3.92-17.37)
No	46	45.5	55	54.5		
Dietary habit						
Not good	110	79.7	28	20.3	<0.001	12.44 (5.75-26.87)
Good	12	24.0	38	76.0		

Cross tabulation of various characteristics of respondents with gastritis status was tested by Fisher's test and presented in Table 2. Data analysis showed a significant association between gender and gastritis status in the study subjects. The number of women suffering from gastritis was higher than men (p -value <0.001 and odds ratio less than 1 (0.28). This means that women are 0.28 times less likely to have gastritis than men, or in other words, men are 3.57 times more likely to have gastritis than women.

The results of this study did not show a significant association between education level and gastritis status ($p=0.12$), indicating that the difference in the proportion of individuals with gastritis between low and high education groups was not strong enough to be considered a statistically significant difference. Although the odds ratio shows a trend that individuals with higher education have a slightly higher risk of developing gastritis, the wide confidence interval (95% CI) (0.33-1.12) indicates that this result is inconsistent and needs to be confirmed by further research. The demographic profile of the respondents in this study was dominated by individuals with a relatively low level of education. A total of 54.3% of the participants had less than a high school education. In addition, the level of participation in the labor force was also relatively low, with 44.7% of respondents not having a job. Furthermore, the results showed that there was no significant difference between income groups below and above the minimum wage in terms of the risk of developing gastritis ($p=0.88$).

Data analysis in Table 2 also showed a significant association between smoking and the risk of developing gastritis. Individuals who smoked had a 2.20 times higher risk of developing gastritis than those who did not smoke (p -value < 0.001). These results suggest that smoking is a strong risk factor for gastritis. Another factor that showed a significant association with the risk



of developing gastritis was the habit of drinking coffee. Individuals who frequently drank coffee had an 8.26 times higher risk of developing gastritis than those who rarely or never drank coffee (p-value < 0.001) obtained from Fisher's test. This finding suggests that excessive coffee consumption may increase a person's risk of developing gastritis. Data analysis using the Chi-Square test showed a highly significant association between poor diet and the risk of gastritis. Individuals with a poor diet had a 12.44 times higher risk of developing gastritis than those with a good diet (p-value < 0.001). These results suggest that an unhealthy diet is a very strong risk factor for gastritis.

Table 3. Multiple Linear Regression Analysis

Variable	B	t	p-value
Smoking	0.033	0,35	0.721
Drinking coffe	0.412	6,13	<0.001**
Dietary habit	0.221	3,09	0.002*

Table 3 presents the results of multiple linear regression analysis aimed at identifying the relationship between several independent variables (gender, diet, smoking and coffee drinking) and the dependent variable, the risk of developing gastritis. The results of the data analysis showed that there was no significant influence between gender (p-value=0.534) and smoking (p-value=0.721) on the risk of gastritis. The results of logistic regression analysis showed that individuals with an unhealthy diet (p = 0.002) had a 2.21 times greater risk of gastritis compared to individuals with a healthy diet. In addition, individuals who frequently consumed coffee (p < 0.001) also had a higher risk of gastritis. These findings suggest that dietary improvement and reduced coffee consumption may be effective prevention strategies to reduce the risk of gastritis.

Discussion

The prevalence of gastritis among the study participants was 64.9%. Risk factors included psychological stress, frequent use of anti-inflammatory drugs, smoking, and consumption of spicy foods (Feyisa & Woldeamanuel, 2021). Age-related patterns vary, with some studies showing higher prevalence in older age groups (Khandelwal et al., 2024). Common symptoms include heartburn, bad taste in the mouth, and flatulence (Elseweidy, 2017; Liu et al., 2024). Helicobacter pylori infection is the main cause of gastritis (Agi et al., 2022). The results of this study show that the number of women suffering from gastritis is higher than men. In a study conducted in Shahdara, Pakistan, 65.98% of gastritis patients were women and only 34.01% of men were affected by gastritis (Feyisa & Woldeamanuel, 2021).

The high prevalence of gastritis among women in this study may be due to the fact that women are more likely than men to visit health facilities for treatment of gastritis and other diseases. Interestingly, a recent study found no significant association between gender and pain scale in gastritis patients (Novitayanti, 2023). These mixed findings suggest that the relationship between gender and gastritis may be influenced by various factors including age, population and comorbidities. Furthermore, smoking has also been shown to contribute to the incidence of gastritis.

Studies have shown that smokers are more likely to develop erosive gastritis compared to non-smokers (Salama et al., 2021). Smoking also increases the risk of gastric intestinal metaplasia, with smokers having a two-fold higher risk than non-smokers (Thrift et al., 2022). The combination of smoking and Helicobacter pylori infection further exacerbates gastric mucosal damage, leading to a higher prevalence of intestinal metaplasia, erosive gastritis,



glandular atrophy, and reactive gastropathy (Salama et al., 2021). In addition, periodontitis, which is associated with smoking, has been linked to an increased risk of chronic gastritis and peptic ulcers (Byun et al., 2020). The severity of gastritis is influenced by smoking habits, and health workers are encouraged to provide counseling on healthy lifestyles to minimize recurrence and complications (Patonah et al., 2023) and the risk of gastric intestinal metaplasia decreases over time after smoking cessation (Thrift et al., 2022).

Multiple linear regression results showed that diet was the factor most strongly associated with the incidence of gastritis. Poor eating habits, such as eating irregularly, eating too fast, and preferring fast or spicy foods, showed an increased risk of gastritis (Li et al., 2020b; Liu et al., 2024). Previous studies have shown that people with gastritis often have a poor diet, whereas those without gastritis tend to maintain a good diet (Prasiwi, 2021). Specific dietary factors associated with gastritis include meal frequency, food type, and portion size (Indah Agustiyani & Isnaeni, 2024). To prevent and reduce cases of gastritis, health workers recommend the implementation of a balanced diet with healthy foods and proper nutrition (Liu et al., 2024; Prasiwi, 2021). Furthermore, the likelihood of gastritis severity is more likely in individuals who skip and delay meals. Individuals who eat by skipping or delaying meals suffer more from acute gastritis than chronic gastritis. Similar research states that gastritis develops because an individual skips and delays meals from the usual time (Li et al., 2020a; Prasiwi, 2021). Another factor in this study that contributed significantly to the incidence of gastritis was the habit of consuming coffee, while smoking did not show a significant effect in the regression test conducted. The results of a previous study conducted on gastritis patients showed that 71.1% of participants drank coffee and only 23.9% stated that they did not drink coffee (Abdulfattah et al., 2023). Regular consumption of coffee, especially more than three cups per day, can trigger gastritis symptoms. The caffeine in coffee can stimulate excessive stomach acid production, irritating the stomach mucosa (Abdulfattah et al., 2023; Santoso, 2023).

Conclusion

Infections caused by *H. pylori* are contagious and pose a threat to public health as they can affect people of all ages. Based on the results of this study, the prevalence of patients who came with gastritis complaints at Royal Prima Hospital was 64.9% where gender, coffee drinking habits, smoking and diet had a significant relationship with the incidence of gastritis while age, education, income, and work did not show a significant relationship with the incidence of gastritis. Diet and coffee drinking are determinants of gastritis incidence in patients visiting Royal Prima Medan Hospital. Educating patients at risk of gastritis by reducing coffee consumption, quitting smoking, improving diet and other factors that can increase gastritis complications are efforts that must be made in preventing an increase in gastritis disease.

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