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ORIGINAL ARTICLE

Gastritis in medical students: An analysis of contributing factors

Farah Shyfa Kesuma[1]*, Ermi Girsang[2], Ali Napiah Nasution[3]

ABSTRACT

Gastritis, defined as inflammation of the stomach lining, can arise from various factors, including Helicobacter pylori infection, stress, poor dietary habits, and the use of certain medications. Medical students represent a population particularly susceptible to gastritis due to high academic pressure, irregular eating patterns, and smoking habits. This study aimed to analyze the risk factors for gastritis among medical students at Prima Indonesia University. This study employed a cross-sectional design involving 123 medical students. Data were collected through questionnaires, and statistical analysis was performed using SPSS version 27. The majority of the study subjects were 21 years old (61.8%) and female (74.8%). Irregular eating habits (82.1%), coffee consumption (74%), and academic stress (79.7%) were prevalent among the subjects. More than half of the subjects had a history of gastritis (57.7%). The risk factors significantly associated with gastritis included female sex (OR=2.362; 95% CI: 1.030-5.414), irregular eating patterns (OR=3.707; 95% CI: 1.385-9.918), coffee consumption (OR=2.569; 95% CI: 1.126-5.861), and academic stress (OR=3.062; 95% CI: 1.227-7.638). Age did not significantly affect the risk of gastritis. Females were found to be more susceptible to gastritis than males, possibly due to hormonal influences and lifestyle factors. Irregular eating patterns and coffee consumption increased the risk of gastritis; however, smoking habits did not show a significant association. Academic stress was identified as an important risk factor, as it can increase gastric acid production. The risk factors significantly associated with gastritis among medical students were female sex, irregular eating patterns, coffee consumption, and academic stress.

Keywords: risk factor, gastritis, medical student

Introduction

Gastritis is an inflammation of the stomach lining that can arise from various causes, leading to a range of symptoms and health implications. Common causes of gastritis include infection with *Helicobacter pylori* bacteria, which is responsible for many cases of chronic gastritis and is prevalent in a significant portion of the population.[1,2] Recent studies indicate that gastritis and duodenitis—a pair of gastrointestinal disorders—are significant global health concerns, with an estimated 31 million cases reported worldwide in 2019.[3] Despite decreases observed globally in standardized incidence and prevalence rates from 1990 to 2019, the burden remains substantial, notably affecting those aged 50–69 years old residing in low socio-demographic index (SDI) regions.[4]

Affiliation
[1]Undergraduate Programme in Medical Science, Universitas Prima Indonesia, Medan, Indonesia
[3]Department of Public Health and Community Medicine, Universitas Prima Indonesia, Medan, Indonesia
[2]Department of Family Medicine, Universitas Prima Indonesia, Medan, Indonesia

*Corespondence:
ermigirsang@unprimdn.ac.id

Medical students are recognized as a high-risk group for gastritis, with studies indicating prevalence rates ranging from 38.6% to 61.2% among university students.[5,6] This vulnerability can be attributed to several factors inherent to the medical profession and the lifestyle choices often made by students in this field. Medical students experience significant pressure. They must study long hours, memorize vast amounts of information, and face high-stakes exams.[7,8] This pressure can lead to chronic stress, which may weaken the immune system and increase susceptibility to infections, including H. pylori, a bacterium that can cause gastritis.[6]

Recent studies have identified several risk factors for gastritis among medical students. Poor eating habits, including irregular meal times and unhealthy food choices, are significant contributors.[5,6] Stress and anxiety are strongly associated with gastritis development, with high perceived stress increasing the odds of experiencing symptoms.[9,10] Other risk factors include smoking and a family history of gastritis.[5,9] Medical students are likely to use nonsteroidal anti-inflammatory drugs (NSAIDs), such as ibuprofen or aspirin, to alleviate headaches and other aches. However, NSAIDs can irritate the stomach lining and increase the risk of gastritis.[11,12]

Investigating the risk factors for gastritis among medical students is essential for several interconnected reasons. The unique pressures and lifestyle characteristics of this group—such as high stress levels, irregular eating habits, and dependence on certain substances—increase their vulnerability to gastritis. Exploring these factors enables early intervention and prevention strategies, ultimately enhancing student well-being and academic performance. This study aims to analyze the risk factors for gastritis among medical students at Universitas Prima Indonesia.

Method

This study utilized a cross-sectional design with an analytical observational approach. The research was conducted at the Faculty of Medicine, Prima Indonesia University, from September until its completion. The study population consisted of medical students from the class of 2021 at Prima Indonesia University, totaling 124 participants. A total sampling technique was employed, including the entire population in the sample.

Data collection involved administering online questionnaires via Google Forms to all participants. Age data were collected through direct questions regarding participants' dates of birth and subsequently categorized into relevant age groups for analysis. Gender identity was assessed using multiple-choice questions with options for 'Male' and 'Female.' Respondents' dietary patterns were assessed through a series of questions regarding eating frequency, types of food consumed, and other related factors. Coffee consumption levels were measured based on the frequency of caffeinated beverage intake. Smoking habits were assessed through questions about the frequency and types of cigarettes consumed. Academic stress levels were evaluated using an instrument comprising a series of questions specifically designed to assess stress related to academic activities.

The collected data were analyzed using univariate analysis to describe each variable's characteristics. Bivariate analysis employing the Chi-square test examined associations between independent variables (age, gender, dietary patterns, coffee consumption, smoking habits, and academic stress) and the dependent variable (occurrence of gastritis). Data processing and analysis were performed using SPSS software.

Results

Table 1 presents the demographic and lifestyle characteristics of the 123 subjects who participated in the study. These characteristics include age, gender, dietary habits, coffee consumption, smoking status, experiences of academic stress, and history of gastritis. This data is crucial for providing context and understanding the population under study. The majority of subjects were 21 years old, totaling 76 individuals (61.8%). Those aged 20 years comprised 27 individuals (22%), while 20 individuals (16.3%) were aged 22 years. This indicates that the sample is predominantly composed of relatively young individuals, particularly those who are 21 years old. In terms of gender distribution, most subjects were female, totaling 92 individuals (74.8%), while 31 individuals (25.2%) were male. This reflects a significant gender imbalance in the sample, with a much larger proportion of females.

Regarding dietary habits, a majority of subjects reported having an irregular diet (101 individuals or 82.1%), while only 22 individuals (17.9%) maintained a regular diet. This suggests that most subjects may be at risk for diet-related digestive issues. Coffee consumption was prevalent among the subjects, with 91

individuals (74%) reporting regular coffee drinking habits, while 32 individuals (26%) did not consume coffee. This indicates that coffee consumption is quite common among the participants. Most subjects did not smoke; specifically, 105 individuals (85.4%) reported being non-smokers, while only 18 individuals (14.6%) smoked. This suggests that the majority of subjects maintain a relatively healthy lifestyle in terms of smoking. Academic stress was experienced by a significant number of subjects, with 98 individuals (79.7%) reporting such experiences, while 25 individuals (20.3%) had never experienced academic stress. This highlights the high prevalence of academic stress within this population.

Finally, more than half of the subjects had a history of gastritis, with 71 individuals (57.7%) reporting such a history compared to 52 individuals (42.3%) who did not. This suggests that gastric problems are relatively common among the study participants..

Table 1. Subject characteristics (n=123)

Characteristic	n	%
Age		
20 years	27	22
21 years	76	61.8
22 years	20	16.3
Gender		
Male	31	25.2
Female	92	74.8
Diet		
Regular	22	17.9
Irregular	101	82.1
Coffee drinking habit		
No	32	26
Yes	91	74
Smoking habit		
No	105	85.4
Yes	18	14.6
Experience academic stress		
No	25	20.3
Yes	98	79.7
Gastritis		
No	52	42.3
Yes	71	57.7

Individuals classified as underweight had an equal proportion of normal and high blood sugar levels (3.35% for each). In the normal BMI category, a greater number of individuals had normal blood sugar levels (23.4%) compared to those with high levels (8.3%). As BMI categories increased (overweight, obesity I, and obesity II), the proportion of individuals with high blood sugar levels also rose. In the obesity I category, the proportion of individuals with high blood sugar levels (27.0%) was significantly greater than those with normal levels (8.3%). Notably, only one individual in the obesity II category had high blood sugar levels (1.7%). This suggests that higher BMI, especially in the obese categories, correlates with an increased risk of elevated blood sugar levels.

Table 2 presents data on the association between various risk factors and the incidence of gastritis among 123 medical students. There was no statistically significant association between age and gastritis incidence (p=0.209), indicating that the age differences among the students did not significantly affect their risk of developing gastritis. A significant association was found between gender and gastritis incidence (p=0.040). The Odds Ratio (OR) of 2.362 (95% confidence interval: 1.030-5.414) indicates that female students are 2.362 times more likely to develop gastritis than their male counterparts. Diet also showed a significant association with the incidence of gastritis (p=0.007), with students maintaining an irregular diet being 3.707 times more likely to experience gastritis compared to those with a regular diet (OR=3.707; 95% confidence interval: 1.385-9.918). Coffee drinking habits were significantly associated with the incidence of gastritis (p=0.023); students who consumed coffee were 2.569 times more likely to experience gastritis than those who did not (OR=2.569; 95% confidence interval: 1.126-5.861).

Table 2. Relationship between risk factors with gastritis among medical student (n=123)

Risk factor	Gastritis			p	OR
	No	Yes	Total		
	n (%)	n (%)	n (%)		
Age					
20 years	11 (40.7)	16 (59.3)	27 (100.0)	0.209	
21 years	29 (38.2)	47 (61.8)	76 (100.0)		
22 years	12 (60.0)	8 (40.0)	20 (100.0)		
Gender					
Male	18 (58.1)	13 (41.9)	31 (100.0)	0.040	2.362 (1.030-5.414)
Female	34 (37.0)	58 (63.0)	92 (100.0)		
Diet					
Regular	15 (68.2)	7 (31.8)	22 (100.0)	0.007	3.707 (1.385-9.918)
Irregular	37 (36.6)	64 (63.4)	101 (100.0)		
Coffee drinking habit					
No	19 (59.4)	13 (40.6)	32 (100.0)	0.023	2.569 (1.126-5.861)
Yes	33 (36.3)	58 (63.7)	91 (100.0)		
Smoking habit					
No	46 (43.8)	59 (56.2)	105 (100.0)	0.406	1.559 (0.544-4.470)
Yes	6 (33.3)	12 (66.7)	18 (100.0)		
Experience academic stress					
No	16 (64.0)	9 (36.0)	25 (100.0)	0.014	3.062 (1.227-7.638)
Yes	36 (36.7)	62 (63.3)	98 (100.0)		

Although there was a difference in the percentage incidence of gastritis between smoker and non-smoker students, this relationship was not statistically significant (p=0.406), suggesting that smoking did not significantly affect gastritis risk in this sample. The experience of academic stress showed a significant association with the incidence of gastritis (p=0.014). Students who experienced academic stress were 3.062 times more likely to develop gastritis than those who did not (OR=3.062; 95% confidence interval: 1.227-7.638). Based on the results of this study, several risk factors were significantly associated with the incidence of gastritis among medical students: gender (female), irregular diet, coffee drinking habits, and academic stress. In contrast, age and smoking habits showed no significant association with the incidence of gastritis in this study.

Discussion

This study's findings reveal a notable relationship between various risk factors and the incidence of gastritis in 123 medical students. The study found that age did not significantly influence the risk of developing gastritis. One study indicated that individuals aged 18-28 have a higher prevalence of acute gastritis compared to those aged 40-50, suggesting that younger age may correlate with lower overall gastritis status.[13] In contrast, other studies indicate an increase in atrophic gastritis (AG) and intestinal metaplasia (IM) prevalence with age, particularly among individuals over 40. Analysis of global data reveals that while age-standardized incidence rates (ASIRs) for gastritis and duodenitis increase with age, there is also a significant burden of these conditions among younger populations.[14] Thus, while older age groups exhibit higher rates, younger individuals are not exempt from experiencing gastritis.

In contrast, gender emerged as a significant predictor of gastritis incidence. Female students were 2.362 times more likely to develop gastritis compared to male students. These findings are in line with previous research indicating that women may be more susceptible to certain digestive conditions due to hormonal influences and possibly different lifestyles.[15] Factors contributing to this difference include both physiological and psychological aspects inherent to males and females. Women are often more emotionally sensitive and susceptible to stress, which can lead to increased gastric acid production and a heightened risk of gastritis.[16] Men typically require higher protein and energy intake, whereas women face a greater risk of vitamin and mineral deficiencies due to dietary inadequacies. The tendency among women, particularly during adolescence and young adulthood, to restrict food intake for weight management may also elevate the risk of gastritis due to prolonged gastric emptying.[15]

Another important factor identified in this study is eating habits. Students with irregular diets were found to be 3.707 times more likely to develop gastritis compared to those with regular diets. An irregular diet often includes the consumption of processed or fast foods, which can irritate the gastric mucosa and contribute to the development of gastritis.[17,18] In addition, coffee consumption was significantly associated with an increased incidence of gastritis. Students who consumed coffee were 2.569 times more likely to experience gastritis compared to those who did not. Previous literature suggests that the caffeine and polyphenols in coffee may exacerbate acid production in the stomach, potentially elevating the risk of developing gastritis.[19,20]

Although a notable difference existed in the incidence of gastritis between smokers and non-smokers, this association was not statistically significant. Therefore, smoking does not seem to play a substantial role in influencing the risk of gastritis within this population. A study conducted in Indonesia identified a significant correlation between smoking and the incidence of gastritis.[21] Similarly, research from South Sulawesi demonstrated a relationship between smoking habits and the occurrence of gastritis.[22] Conversely, a study conducted in Southeast Aceh found no significant association between smoking and gastritis (Safii & Andriani, 2019).[23] Interestingly, Namiot et al.[24] observed that among H. pylori-infected individuals, smokers exhibited lower H. pylori density and inflammatory cell infiltration in the gastric corpus compared to non-smokers. This finding suggests that smoking may influence the histology of gastritis differently in populations infected with H. pylori. Additionally, factors such as coffee consumption and dietary habits have also been associated with gastritis.[22,23] These findings underscore the complex relationship between smoking and gastritis, indicating a need for further investigation.

Academic stress is another significant factor associated with gastritis incidence. Students under academic stress are 3.062 times more likely to develop gastritis than their peers without stress. Academic stress significantly contributes to the development of gastritis, especially among university students. This stress is closely linked to hormonal changes that elevate gastric acid production, including hydrochloric acid (HCl) and pepsin. During stressful periods, cortisol is released, stimulating gastric acid secretion through neuroendocrine mechanisms.[25] These findings highlight the multifaceted nature of gastritis risk factors in young adults, stressing the need to address dietary habits, manage stress levels, and consider gender-specific vulnerabilities in prevention efforts. Understanding these interconnected factors enables healthcare providers to tailor effective prevention strategies to mitigate associated risks

Conclusion

This study investigated the risk factors associated with gastritis in medical students at Prima Indonesia University. The research involved 123 participants and examined several factors, including age, gender, dietary patterns, coffee consumption, smoking habits, academic stress, and a prior history of gastritis. The main findings indicated that age was not significantly associated with the risk of gastritis. However, female students were more susceptible to gastritis than male students. Irregular dietary patterns were also associated with an increased risk of gastritis compared to regular dietary patterns. Coffee consumption was associated with an increased risk of gastritis; however, smoking habits did not show a significant effect. Additionally, academic stress was identified as a factor that increased the risk of gastritis among students.

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