



## FACTORS ASSOCIATED WITH SYMPTOMS OF GASTROESOPHAGEAL REFLUX DISEASE AMONG MEDICAL STUDENTS OF UNIVERSITAS NEGERI GORONTALO

### FAKTOR-FAKTOR YANG BERHUBUNGAN DENGAN GEJALA GASTROESOPHAGEAL REFLUX DISEASE PADA MAHASISWA KEDOKTERAN UNIVERSITAS NEGERI GORONTALO

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#### Abstract

Digestion is a very important process for the health and well-being of the body, if it is not properly managed, it can increase the risk of more serious health problems, one of which is Gastroesophageal Reflux Disease (GERD). Risk factors that may contribute to the development of GERD include poor dietary pattern, physical activity, medication use, sleep quality, lifestyle, and academic stress. This study employs an analytical and approach using a quantitative method with a cross-sectional design. The population and sample consisted of 106 students selected using purposive sampling. Data analysis was conducted using a univariate and bivariate analyses. The chi-square test result showed that dietary pattern, physical activity, medication use, sleep quality, lifestyle, and academic stress had a significant association with GERD symptoms, with p-values < 0,05. It is recommended that students pay attention to dietary patterns, physical activity, medication use, sleep quality, lifestyle, and manage stress properly to achieve better health. For the Faculty of Medicine, it is recommended that education be provided regarding the importance of maintaining student health, particularly in relation to dietary patterns, physical activity, medication use, sleep quality, lifestyle, and stress management. Future researchers are encouraged to further develop follow-up studies on factors associated with GERD symptoms.

**Keywords :** GERD, Dietary Pattern, Physical Activity, Academic Stress.

#### Abstrak

Pencernaan merupakan proses yang sangat penting untuk kesehatan dan kesejahteraan tubuh, jika tidak dikelola dengan baik dapat meningkatkan risiko masalah kesehatan yang lebih serius, salah satunya ialah Gastroesophageal Reflux Disease (GERD). Faktor risiko yang dapat menyebabkan GERD meliputi pola makan yang buruk, aktivitas fisik, penggunaan obat, kualitas tidur, perubahan gaya hidup, dan stres akademik. Penelitian ini merupakan penelitian study analitik dengan metode kuantitatif menggunakan pendekatan cross sectional. Populasi dan sampel mahasiswa yang berjumlah 106 dengan menggunakan teknik Purposive Sampling. Analisis data menggunakan analisis univariat dan analisis



bivariat. Hasil uji chi square menunjukkan variabel pola makan, aktivitas fisik, penggunaan obat, kualitas tidur, gaya hidup, dan stres akademik memiliki hubungan yang signifikan terhadap gejala GERD dengan nilai p value <0,05. Disarankan mahasiswa tetap memperhatikan pola makan, aktivitas fisik, penggunaan obat, kualitas tidur, gaya hidup serta mengelola stres dengan baik agar mendapat kesehatan yang lebih baik, untuk Fakultas Kedokteran agar dapat memberikan edukasi mengenai pentingnya menjaga kesehatan mahasiswa, khususnya dalam hal pola makan, aktivitas fisik, dan pengelolaan stres, untuk peneliti selanjutnya agar dapat terus mengembangkan penelitian lanjutan tentang faktor-faktor yang berhubungan dengan gejala GERD.

**Kata Kunci :** GERD, Pola makan, Aktivitas fisik, Stres akademik.

## 1. INTRODUCTION

Gastroesophageal Reflux Disease (GERD) is a common gastrointestinal disorder caused by the weakening of the lower esophageal sphincter, allowing stomach acid to rise into the esophagus (Vakil et al., 2006). This condition is often confused with gastritis because they have similar symptoms, although their underlying mechanisms are different. Globally, GERD is estimated to affect around 14% of the world's population, with an increasing trend in cases in various countries, including Asia (Taraszewska, 2021). Several studies show that lifestyle and behavioral factors such as irregular dietary patterns, physical activity, medication use, sleep quality, and stress play a role in the onset of GERD symptoms (Patala et al., 2021; Juen et al., 2023). Medical students are a group that is prone to GERD due to high academic demands, irregular eating patterns, lack of sleep, and stress. GERD can have a negative impact on students' daily activities and academic performance (Kuswono et al., 2021; Puspitasari et al., 2024). Therefore, this study aims to analyze the factors associated with GERD symptoms in medical students.

Gastroesophageal Reflux Disease (GERD) is a medical condition in which stomach acid repeatedly rises back into the esophagus, causing uncomfortable symptoms. Heartburn, pain or discomfort in the epigastric region, dysphagia, regurgitation of fluids, chest pain, hoarseness, coughing due to aspiration, and asthma are symptoms that occur in people with GERD (Saputera & Budianto., 2017).

A diet that includes frequent consumption of hot, spicy, and acidic foods can cause stomach problems. These types of foods can increase stomach acid production, triggering acid reflux into the esophagus. This condition is typically characterized by a burning sensation in the chest (heartburn). If it persists, acid reflux can cause irritation of the esophagus and lead to more serious digestive disorders, one of which is GERD (Ajjah et al., 2020).

Physical activity can affect GERD symptoms, although the impact can vary depending on the type, intensity, and timing of exercise. In general, exercise has a positive effect on digestion and overall health, such as improving overall physical condition (reducing obesity), improving heart health, and increasing metabolism. Obesity is a major risk factor for GERD, as excess weight can increase pressure on the stomach and cause stomach acid to rise into the esophagus (gullet). Other positive effects include improving digestive function and reducing stress (Sara et al., 2021).



The use of medication not only provides benefits but also has disadvantages. Some dietary supplements can worsen GERD symptoms, especially those that interfere with LES function, including antidepressants, calcium channel blockers, and narcotics. This category also includes excessive consumption of nonsteroidal anti-inflammatory drugs (NSAIDs) and certain antibiotics. These medications can increase gastric acid secretion and inhibit gastric emptying (Patala et al., 2021).

Sleep quality and GERD have a two-way relationship because they influence and exacerbate each other. GERD symptoms such as heartburn, coughing, and discomfort in the throat can interfere with sleep quality, as they can cause you to wake up at night. Poor sleep can also worsen GERD symptoms because lack of sleep can increase stress, disrupt hormone regulation, and weaken the LES. When LES pressure decreases or the muscles weaken, the barrier between the stomach and esophagus becomes less effective, allowing stomach acid to more easily reflux into the esophagus (Tan et al., 2024).

Smoking and coffee consumption are part of a lifestyle associated with GERD. Nicotine in cigarettes can lower LES pressure and increase gastric acid secretion. Meanwhile, coffee consumption can stimulate gastric acid production and inhibit gastric emptying, thereby triggering acid reflux and worsening GERD symptoms (Patria., 2023).

Stress often worsens GERD symptoms, as it can increase stomach acid production, reduce LES function, and affect stomach movement. Therefore, effective stress management can help reduce GERD symptoms. Stress refers to the way individuals carry out tasks involving cognition, emotions, planning, or schedules, as well as strategies for solving problems. This begins with identifying sources of stress that arise in everyday life (Jannah et al., 2021).

## 2. RESEARCH METHOD

This study used an analytical study design with a cross-sectional approach to analyze the relationship between factors associated with Gastroesophageal Reflux Disease (GERD) symptoms in students at the Faculty of Medicine, UNG. Data were collected using a structured questionnaire distributed to respondents. The questionnaire covered variables such as dietary patterns, physical activity, medication use, sleep quality, lifestyle (smoking and coffee consumption), academic stress, and GERD symptoms. The research subjects were 106 students from the Faculty of Medicine, UNG, class of 2022 and 2023, selected using purposive sampling. The data were analyzed univariately and bivariately. Bivariate analysis was performed using the Chi-Square test to determine the relationship between independent variables and GERD symptoms.



### 3. RESULT AND DISCUSSION

#### a. Characteristics of Respondents

Table 1. Characteristics of Respondents

Karakteristik	Frekuensi	
	(n)	(%)
<b>Usia</b>		
18-20	62	58,5
21-23	44	41,5
<b>Jenis Kelamin</b>		
Laki-laki	28	26,4
Perempuan	78	73,6
<b>Tahun Akademik</b>		
2022	47	44,3
2023	59	55,7

Source: Primer Data, 2025

Based on the distribution of student characteristics, it is known that the majority of students are in the 18-20 age group, totaling 62 students (58.5%). In addition, the majority of students are female, totaling 78 students (73.6%). Based on the year of enrollment, the majority of students are enrolled in the 2023 class, totaling 59 students (55.7%).

#### b. Univariate Analysis

Table 2. Frequency Distribution and Percentage of Respondents based on Research Variables

Variabel	Frekuensi	
	(n)	(%)
<b>Gejala GERD</b>		
Ya	33	31,1
Tidak	73	68,9
<b>Pola Makan</b>		
Baik	6	5,7
Cukup	68	64,2
Buruk	32	30,2
<b>Aktivitas Fisik</b>		
Tinggi	13	12,3
Sedang	20	18,9
Rendah	73	68,9
<b>Penggunaan Obat</b>		
Tidak Berisiko	93	87,7
Berisiko	13	12,3
<b>Kualitas Tidur</b>		
Baik	34	32,1
Buruk	72	67,9
<b>Gaya Hidup</b>		
Baik	82	77,4
Buruk	24	22,6
<b>Stres Akademik</b>		



Variabel	Frekuensi	
	(n)	(%)
Rendah	20	18,9
Sedang	63	59,4
Tinggi	23	21,7

Source: Primer Data, 2025

Based on Table 4.2, it was found that most students did not have GERD symptoms, namely 73 students (68.9%), while 33 students (31.1%) had GERD symptoms. Regarding dietary patterns, 6 students (5.7%) had a good dietary pattern, 68 students (64.2%) had an adequate dietary pattern, and 32 students (30.2%) had a poor dietary pattern. Regarding physical activity, 13 students (12.3%) had high physical activity, 20 students (18.9%) had moderate physical activity, and 73 students (68.9%) had low physical activity. Regarding medication use, 93 students (87.7%) took non-risky medications, while 13 students (12.3%) took risky medications. In terms of sleep quality, 34 students (32.1%) had good sleep quality, while 72 students (67.9%) had poor sleep quality. In terms of lifestyle, 82 students (77.4%) had a good lifestyle, while 24 students (22.6%) had a poor lifestyle. Furthermore, regarding academic stress, 20 students or 18.9% had low academic stress, 66 students or 59.4% had moderate academic stress, and 23 students or 21.7% had high academic stress.

### c. Bivariate Analysis

**Table 3. The Relationship Between Each Factor and GERD Symptoms in Medical Students at Gorontalo State University**

Variabel	Gejala GERD				Total	p value	
	Ya		Tidak				
	n	%	n	%	n	%	
<b>Pola Makan</b>							
Baik	2	6,1	4	5,5	6	5,7	0,019
Cukup	15	45,5	53	72,6	68	64,2	
Buruk	16	48,5	16	21,9	32	30,2	
<b>Aktivitas Fisik</b>							
Tinggi	8	24,2	5	6,8	13	12,3	0,015
Sedang	8	24,2	12	16,4	20	18,9	
Rendah	17	51,5	56	76,7	73	68,9	
<b>Penggunaan Obat</b>							
Tidak Berisiko	22	66,7	71	97,3	93	87,7	0,000
Berisiko	11	33,3	2	2,7	13	12,3	
<b>Kualitas Tidur</b>							
Baik	4	12,1	30	41,0	34	32,1	0,003
Buruk	29	87,9	43	58,9	72	67,9	
<b>Gaya Hidup</b>							
Baik	20	60,6	62	84,9	82	77,4	0,006
Buruk	13	39,4	11	15,1	24	22,6	
<b>Stres Akademik</b>							
Rendah	3	9,1	17	23,3	20	18,9	0,025
Sedang	18	54,5	45	61,6	63	59,4	
Tinggi	12	36,4	11	15,1	23	21,7	



*Source: Primer Data, 2025*

1) The Relationship Between Dietary Patterns and Gastroesophageal Reflux Disease Symptoms

Statistical tests show that dietary patterns have a sig-p value of  $0.019 < 0.05$ , meaning that dietary patterns are associated with GERD symptoms in medical students at the Faculty of Medicine, Gorontalo State University. The results of this study are in line with the research by Ajjah et al. (2020) at the Faculty of Medicine, Syiah Kuala University, which showed that GERD was less common in students with good eating habits compared to those with poor eating habits, with the Chi-Square test results showing a significant relationship between eating habits and the incidence of GERD ( $p = 0.004$ ) (Ajjah et al., 2020).

2) The Relationship Between Physical Activity and Gastroesophageal Reflux Disease Symptoms

Based on statistical test results, the sig-p value of 0.015 or  $< 0.05$  indicates that physical activity is associated with GERD symptoms in medical students at Gorontalo State University. The results of this study are in line with Sutanto's (2022) research at Pelita Harapan University, which showed that GERD was less common in students with moderate physical activity compared to those with low physical activity, with the Chi-Square test results showing a significant relationship between physical activity and the incidence of GERD ( $p = 0.046$ ) (Sutanto., 2022).

3) The Relationship Between Dietary Patterns and Gastroesophageal Reflux Disease Symptoms

Based on statistical test results with a sig-p value of 0.000 or  $< 0.05$ , this indicates that the use of drugs is associated with GERD symptoms in medical students at Gorontalo State University. The analysis results showed a significant relationship between medication use and GERD symptoms ( $p < 0.05$ ). However, this relationship differs from previous theories stating that the use of certain medications can increase the risk of GERD (Hariyani et al., 2024; Patala et al., 2021). In this study, most students who experienced GERD did not use risky medications, while students who did not experience GERD symptoms almost all did not use risky medications.

4) The Relationship Between Dietary Patterns and Gastroesophageal Reflux Disease Symptoms

Based on statistical test results, the sig-p value of 0.003 or  $< 0.05$  indicates that sleep quality is related to GERD symptoms in medical students at Gorontalo State University. The results of this study align with the research by Hafidz and Debby (2021) at the University of Muhammadiyah North Sumatra, which showed that students with poor sleep quality experienced GERD more frequently than those with good sleep quality. The Chi-Square test results indicated a significant relationship between sleep quality and the occurrence of GERD ( $p = 0.004$ ) (Hafizh & Debby., 2021).



## 5) The Relationship Between Dietary Patterns and Gastroesophageal Reflux Disease Symptoms

Based on statistical test results, the sig-p value of 0.006 or  $< 0.05$  indicates that lifestyle is related to GERD symptoms in medical students at Gorontalo State University. The results of this study are in line with Patria's (2023) research at Syarif Hidayatullah State Islamic University Jakarta, which showed that GERD was more prevalent among students who smoked than those who did not, with the Chi-Square test results showing a significant relationship between smoking habits and the incidence of GERD ( $p = 0.000$ ). In addition, the study also showed that students with higher coffee consumption often experienced GERD compared to students with low coffee consumption, with a statistically significant relationship ( $p = 0.014$ ) (Patria., 2023).

## 6) The Relationship Between Dietary Patterns and Gastroesophageal Reflux Disease Symptoms

Based on statistical test results, the sig-p value of 0.025 or  $< 0.05$  indicates that academic stress is associated with GERD symptoms in medical students at Gorontalo State University. The results of this study are in line with Faisa's (2024) research at Muhammadiyah University Prof. Dr. Hamka, which showed a significant relationship between stress levels and the incidence of GERD in medical students, with the Spearman test results indicating a significant relationship between stress levels and the incidence of GERD in medical students ( $p = 0.000$ ) (Faisa., 2024).

## 4. CONCLUSION

Based on the results of a study conducted on 106 medical students at Gorontalo State University, it can be concluded that there is a relationship between factors such as diet, physical activity, medication use, sleep quality, lifestyle (smoking and coffee consumption), and academic stress with symptoms of Gastroesophageal Reflux Disease in medical students at UNG. These factors play an important role in the emergence of Gastroesophageal Reflux Disease symptoms, so prevention efforts are needed through lifestyle improvements, stress management, and increasing student awareness of the importance of maintaining digestive health.

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