The Association Between Gastroesophageal Reflux Disease (Gerd) And Sleep Quality Among Medical Students Of The Indonesian Muslim University Class Of 2021

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Abstract.

The Association Between Gastroesophageal Reflux Disease (Gerd) and Sleep Quality in Medical Faculty Students of Indonesian Muslim University Class of 2021. Gastroesophageal Reflux Disease (GERD) is a chronic gastrointestinal disorder characterized by the regurgitation of stomach contents into the esophagus, causing symptoms such as heartburn, regurgitation, sore throat, and cough. GERD can worsen sleep quality, contributing to sleep disorders. This study aims to examine the association between GERD and sleep quality among medical students at Indonesian Muslim University Class of 2021. This study employed a descriptive analytics desing with a cross-sectional approach, and the sample was selected through total sampling. The chi-square test was applied to analyze the association between GERD and sleep quality with a significance level of p < 0.05. Among 274 respondents, 45 (16.4%) had GERD, while 229 (83.6%) did not. Additionally, 42 (15.3%) had good sleep quality, whereas 232 (84.7%) had poor sleep quality. Statistical analysis showed a p-value = 0.027, indicating a significant association between GERD and sleep quality (p < 0.05). The findings suggest that students with GERD are at a higher risk of experiencing poor sleep quality. These results highlight the need for preventive measures and interventions to improve sleep quality in students suffering from GERD.

Keywords: GERD, Sleep Quality, Medical Students and Gastrointestinal Disorders.

I.   INTRODUCTION

Gastroesophageal reflux disease (GERD) is a common gastrointestinal disorder characterized by the back flow of gastric contents into the esophagus, leading to symptoms such as heartburn, regurgitation, sore throat, and chronic cough [1], [2]. Indigestion, including GERD, is a widespread health issue, with the American Nutrition Association estimating that over 70 million people experience digestive disorders daily. The increasing global prevalence of GERD varies significantly across regions, with studies indicating that the prevalence in East Asia ranged from 2.5% to 4.8% before 2005, increasing to 5.2%–8.5% between 2005 and 2010, while Southeast and West Asia reported a higher prevalence of 6.3%–18.3% during the same period [3], [4]. In Indonesia, epidemiological data on GERD prevalence remains limited, yet a survey conducted between 2013 and 2015 involving 2,045 subjects found that 57.6% had GERD, indicating a higher prevalence than in East Asia [5], [6]. Additionally, at Cipto Mangunkusumo General Hospital in Jakarta, 22.8% of patients undergoing endoscopy for dyspepsia were diagnosed with esophagitis [7]. The varying prevalence between countries is attributed to socioeconomic factors and lifestyle changes, including excessive coffee consumption, unhealthy dietary habits, high body mass index (BMI $\geq$ 25 kg/m²), and disrupted sleep patterns, all of which contribute to the increasing incidence of GERD [8]–[10].

Medical students, particularly those in their final years, are at a heightened risk of developing GERD due to high academic stress, irregular sleep schedules, and poor dietary habits. Research indicates that 25% of university students, including 38.6% of final-year MBBS students, report GERD-related symptoms [9], [11], [12]. The association between GERD and sleep disturbances is well-documented, with studies showing that 74% of GERD sufferers experience nighttime symptoms at least once per week, while 47%–57% report heartburn disrupting their sleep [13], [14]. Nocturnal GERD symptoms can lead to fragmented sleep,

increased daytime fatigue, and impaired academic performance. This bidirectional association is explained by physiological changes during sleep, such as delayed gastric emptying and reduced lower esophageal sphincter pressure, which exacerbate nighttime reflux [15], [16]. Furthermore, studies indicate that sleep deprivation itself can contribute to increased acid production and esophageal hypersensitivity, worsening GERD symptoms [2], [17], [18].

Given the significant impact of GERD on students academic performance, mental health, and overall well-being, understanding the association between GERD and sleep quality is crucial, particularly among medical students at Indonesian Muslim University, class of 2021. Effective management strategies should focus on lifestyle modifications, dietary adjustments, and stress reduction techniques to alleviate GERD symptoms and improve sleep quality [19], [20]. Additionally, educational programs aimed at increasing awareness of GERD risk factors and sleep disturbances can empower students to take proactive steps in managing their health, ultimately enhancing their academic performance and quality of life [11], [20], [21]. Future research should explore the long-term effects of GERD on sleep quality and overall well-being in medical students through longitudinal studies while evaluating the efficacy of various interventions in mitigating GERD-related health consequences.

II. METHODS

The type of research used in this study is descriptive analytic method with a cross-sectional approach [22], [23]. In this study, data were collected only once to explore the association between gastroesophageal reflux disease (GERD) and sleep quality in the 2021 batch of students of the Faculty of Medicine, Muslim Indonesia University. The population that became the focus of this study were all students of the Faculty of Medicine, Universitas Muslim Indonesia class of 2021. Sampling was carried out using the total sampling method, in which all members of the population who met the inclusion criteria would be included in the study. Data sources were obtained from respondents through a questionnaire distributed online using Google Form. This questionnaire was designed to collect information regarding GERD symptoms and respondents sleep quality. After the data was collected, the researcher will enter the data into the Statistical Package for the Social Sciences (SPSS) program for further analysis [24], [25]. The analysis includes univariate analysis to describe the characteristics of the respondents and the variables studied, as well as bivariate analysis to examine the association between GERD and sleep quality [26]. With this approach, it is hoped that the study can provide a deeper insight into the impact of GERD on students'sleep quality, as well as provide useful information for the development of more effective intervention strategies in improving students health.

III. RESULT AND DISCUSSION

Table 1. Distribution of Respondent Characteristics

Respondent Characteristics		Frequency	Percentage (%)
Gender (Sex)	Female	199	72.6
	Male	75	27.4
Age	20	55	20.1
	21	162	59.1
	22	53	19.3
	23	4	1.5
TOTAL		**274**	**100.0**

Source: Primary Data Result, 2024

Table 1 presents the distribution of respondent characteristics, including gender and age, among the 274 participants in this study. The gender distribution shows a higher proportion of female respondents (199 individuals, 72.6%) compared to male respondents (75 individuals, 27.4%). This indicates that the majority of participants in this study were female, which may reflect the demographic composition of the Faculty of Medicine at Universitas Muslim Indonesia or a higher willingness of female students to participate in health-related research. In terms of age distribution, the majority of respondents were 21 years old (162 individuals, 59.1%), followed by those aged 20 years (55 individuals, 20.1%) and 22 years (53 individuals, 19.3%). The smallest proportion of respondents were 23 years old (4 individuals, 1.5%), indicating that most participants

were in their early academic years. This age distribution is consistent with the typical age range of undergraduate medical students in Indonesia, where students enter medical school around the age of 18 or 19 and progress through their studies in a structured timeline. The findings from this table provide essential context for understanding the characteristics of the study population. Given the predominance of female respondents and the concentration of ages around 20–22 years, these demographic factors may influence the interpretation of health-related variables such as Gastroesophageal Reflux Disease (GERD) prevalence and sleep quality.

Table 2. Distribution of GERD Diagnosis

Diagnosis of GERD	Frequency	Percentage (%)
No GERD	229	83.6
Suffering from GERD	45	16.4
TOTAL	274	100.0

Source: Primary Data Result, 2024

Table 2 presents the distribution of Gastroesophageal Reflux Disease (GERD) diagnosis among the 274 respondents in this study. The majority of participants, 229 individuals (83.6%), did not suffer from GERD, while 45 individuals (16.4%) were diagnosed with GERD. These findings indicate that although GERD is present among medical students, it affects a smaller proportion (16.4%) of the study population. The relatively lower prevalence of GERD in this study aligns with previous research indicating that GERD affects a subset of individuals exposed to certain risk factors, such as high academic stress, irregular eating patterns, and consumption of triggering foods and beverages. Medical students, in particular, are known to experience lifestyle-related risk factors that may contribute to the development or exacerbation of GERD symptoms, including irregular meal schedules, high caffeine intake, and sleep deprivation. While the majority of students in this study did not report GERD symptoms, the 16.4% prevalence suggests that a significant minority may require targeted lifestyle modifications and medical interventions to manage their condition effectively.

Table 3. Distribution of Sleep Quality

Sleep Quality	Frequency	Percentage (%)
Good	42	15.3
Bad	232	84.7
Total	274	100.0

Source: Primary Data Result, 2024

Table 3 presents the distribution of sleep quality among the 274 respondents in this study. The findings indicate that the majority of participants, 232 individuals (84.7%), reported having poor sleep quality, while only 42 individuals (15.3%) experienced good sleep quality. This substantial prevalence of poor sleep quality highlights a concerning issue, particularly among medical students, who are known to face high academic demands and stress, which can significantly impact their sleep patterns. The high percentage of poor sleep quality may be attributed to several factors, including irregular sleep schedules, extended study hours, academic pressure, and lifestyle habits such as excessive screen time before bed. Additionally, medical students often experience increased stress levels, which may contribute to insomnia and fragmented sleep, further exacerbating their sleep disturbances. Given that adequate sleep is essential for cognitive function, emotional well-being, and overall health, the high prevalence of poor sleep quality among medical students underscores the need for targeted interventions to promote better sleep hygiene. Implementing strategies such as time management techniques, stress reduction programs, and educational initiatives on the importance of sleep may help improve the overall well-being and academic performance of medical students.

Table 4. Chi-Square Test of GERD on Sleep Quality

		Sleep Quality			Value
		Good	Bad	Total	
Prevalence of GERD	No GERD	40	189	229	
	Suffering from GERD	2	43	45	0.027
	TOTAL	42	232	274	

Source: Primary Data Result, 2024

Table 4 presents the Chi-Square test results examining the association between Gastroesophageal Reflux Disease (GERD) and sleep quality among the 274 respondents. The findings show that among 229 respondents without GERD, 40 individuals (17.5%) had good sleep quality, while 189 individuals (82.5%) reported poor sleep quality. In contrast, among the 45 respondents diagnosed with GERD, only 2 individuals (4.4%) had good sleep quality, whereas 43 individuals (95.6%) experienced poor sleep quality. The statistical analysis yielded a p-value of 0.027, indicating a significant association ($p < 0.05$) between GERD and poor sleep quality. This result suggests that individuals suffering from GERD are more likely to experience disturbed or poor sleep quality compared to those without GERD. The high prevalence of poor sleep among GERD sufferers can be attributed to nocturnal acid reflux, delayed gastric emptying, and transient lower esophageal sphincter relaxation (TLSR), which are known to disrupt sleep by causing discomfort, regurgitation, and frequent awakenings. These findings align with previous studies that highlight GERD as a risk factor for sleep disturbances, as nocturnal reflux symptoms can prolong acid exposure in the esophagus, delay sleep onset, and lead to fragmented sleep cycles. The significant correlation found in this study underscores the need for better GERD management strategies among medical students, including dietary modifications, stress management, and lifestyle adjustments, to improve sleep quality.

Discussion

Association of Gastroesophageal Reflux Disease (GERD) with Sleep Quality in Medical Students

Gastroesophageal Reflux Disease (GERD) is one of the chronic digestive disorders that is common throughout the world. Based on the results of this study, the prevalence of GERD in students of the Faculty of Medicine, Universitas Muslim Indonesia (UMI) class of 2021 was 16.4%. This prevalence is not much different from the research conducted on Baiturahmah University Medical students, which was 16.8%. Meanwhile, another study conducted at the Faculty of Medicine, North Sumatra University (USU) involving 211 respondents showed a lower prevalence of GERD, namely 10.4%. This difference in prevalence suggests that there are certain factors that contribute to the risk of GERD in medical students, including unhealthy diet, lifestyle changes, psychological stress, and high consumption of fast food and caffeinated drinks. Medical students often have unhealthy eating habits due to their busy academic schedules. They tend to prefer fast food that is practical to consume in the midst of busy studying and academic assignments. In addition, coffee consumption as a study companion is also a common habit among medical students. Research conducted states that high-fat fast food can irritate the esophagus and affect Lower Esophageal Sphincter (LES) tone, while caffeine in coffee can induce LES relaxation, both of which contribute to gastric acid reflux and aggravate GERD symptoms [27]–[30].

Association between GERD and Sleep Quality

The association between GERD and sleep quality has been the subject of many studies. One of the main factors linking the two is slower gastric emptying during sleep. This delay leads to increased intragastric pressure and distension of the gastric fundus, which in turn increases the risk of gastric acid reflux during the night. The main mechanism involved in the pathogenesis of GERD is Transient LES Relaxation (TLSR), which is inhibited during sleep. In addition, during sleep, there is a decrease in salivary secretion and flow and swallowing frequency leading to reduced esophageal peristalsis. As a result, there is a slowdown in the clearance of gastric acid from the esophagus, which prolongs acid exposure and inhibits alkalization and normalization of esophageal pH after reflux occurs. The results of this study showed that out of 274 respondents, 232 people (84.7%) had poor sleep quality, while 42 people (15.3%) had good sleep quality. Previous research conducted at Universitas Muslim Indonesia regarding the association between sleep quality and academic achievement of Faculty of Medicine students showed that 82.8% of students had poor sleep quality.

This data is almost in line with the results obtained in this study, confirming that the high rate of poor sleep quality in medical students may be caused by various factors, including academic pressure, task load, unhealthy lifestyle, and psychological stress. Some factors that are often associated with poor sleep quality include environmental conditions such as room temperature, noise, lighting, use of gadgets before bedtime, and obesity. Medical students often experience high academic pressure, especially in preparation

for exams, presentations, and other academic tasks that must be completed in a limited amount of time. In addition, involvement in extracurricular activities or organizations also adds to their time burden, which may result in a lack of adequate and quality sleep. Support for these findings is also provided by research conducted that medical students tend to have high levels of stress, making them vulnerable to sleep disturbances [31]. High stress levels can trigger the production of the hormone cortisol which can increase gastric acid secretion, thus exacerbating GERD symptoms that contribute to sleep disturbances [10].

GERD and Risk of Poor Sleep Quality

A study conducted at RSUD Sanjiwani Gianyar involving 104 respondents showed that 84.0% of those suffering from GERD symptoms had poor sleep quality, with significant results ($p < 0.002$). These results are in line with research conducted that patients with GERD symptoms had a 3.5 times higher risk of experiencing sleep disturbances than individuals without GERD [28]. Poor sleep quality can be influenced by various factors, including lifestyle, disease history, stress levels, emotional state, fatigue, motivation, nutrition, and environmental conditions. Academic stress in medical students, especially before exams, can cause anxiety disorders that trigger the body physiological responses, such as increased gastric acid production and muscle tension, which can worsen GERD symptoms. In addition, lack of sleep can lead to hormonal imbalances, including an increase in the hormone ghrelin that increases appetite and the tendency to consume unhealthy foods, which can ultimately aggravate GERD.

This study underscores the importance of a deeper understanding of the association between GERD and sleep quality in medical students. Given the high prevalence of GERD among medical students and its impact on sleep quality and overall health, more effective interventions in GERD management and sleep quality improvement are needed. Some preventive measures that can be taken include adjusting diet by avoiding high-fat and caffeinated foods before bedtime, maintaining a regular sleep schedule, and managing stress well through relaxation techniques or exercise. In addition, an educational approach is also an important step in increasing students awareness of the association between GERD and sleep quality. By providing better information on healthy lifestyles, medical students can take more effective preventive measures to reduce their risk of GERD and improve their sleep quality. Further research-based interventions are also needed to explore the best strategies for managing GERD and sleep disorders, especially in demanding academic contexts such as the medical student environment [32]–[34].

IV. CONCLUSION

This study demonstrates a significant association between GERD and sleep quality among medical student, Universitas Muslim Indonesia class of 2021. Students with GERD are more at risk of having poor sleep quality than those without GERD. The high prevalence of poor sleep quality among medical students suggests the need for more attention to factors that contribute to sleep disorders, including academic pressure, diet, and stress management. This study confirms that education-based intervention strategies and lifestyle changes are needed to improve the quality of life of students with GERD and sleep disorders. It is hoped that further research can explore more effective methods in managing GERD and improving sleep quality among medical students.

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