

## Prevalence of Gastroesophageal reflux disease symptoms in medical clerkship students in Raden Mattaher Hospital, Jambi

Afifah Amatullah<sup>1\*</sup>, Zahra Frizki Asty<sup>2</sup>, Zilzikridini Wijayanti<sup>3</sup>, Denok Tri Hardiningsih<sup>4</sup>

<sup>1</sup> Department of Internal Medicine, Faculty of Medicine and Health Sciences, Universitas Jambi – Raden Mattaher Hospital, Jambi, Indonesia;

<sup>2</sup> Department of Microbiology and Parasitology, Faculty of Medicine and Health Sciences, Universitas Jambi;

<sup>3</sup> Department of Public Health Sciences, Faculty of Medicine and Health Sciences, Universitas Jambi;

<sup>4</sup> Department of Phytopharmacy, Faculty of Medicine and Health Sciences, Universitas Jambi;

\*Corresponding Authors: afifahamatullah@unja.ac.id

### Abstract

**Background:** Gastroesophageal Reflux Disease (GERD) is a gastrointestinal disorder caused by the recurrent reflux of gastric contents into the esophagus, leading to symptoms and complications. Clinical clerkship medical students are a vulnerable group for GERD due to irregular eating habits, high stress levels, and poor sleep quality. The prevalence and associated risk factors of GERD in this population need to be explored, as they may impact health, quality of life, and academic performance. **Methods:** This study employed an analytical cross-sectional design involving medical students in the clinical clerkship program at Raden Mattaher Hospital, Jambi. A total of 150 respondents were recruited using purposive sampling. GERD symptoms were assessed by using GERD-Questionnaire. The prevalence was calculated using SPSS 26. **Results:** The study revealed that the prevalence of GERD symptoms among medical clerkship students was 21.3% and the remaining 78.7% was all at risk of having GERD. **Conclusion:** The high prevalence of GERD among clinical clerkship medical students highlights the need for increased attention to modifiable risk factors.

**Keywords:** clinical clerkship; GERD; medical students.

### Cite This Article

Amatullah, A., Asty, Z. F., Wijayanti, Z., & Hardiningsih, D. T. (2025). Prevalence of gastroesophageal reflux disease symptoms in medical clerkship students in Raden Mattaher Hospital, Jambi. *Proceedings Academic Universitas Jambi*, 1(2). 459-467.

### Editor

I Made Dwi Mertha Adnyana, M.Ked.Trop.

### Article info

Received: October 02, 2025. Revised: October 05, 2025. Accepted: November 09, 2025



## INTRODUCTION

Gastroesophageal Reflux Disease (GERD) is globally recognized as one of the most prevalent chronic digestive disorders, significantly affecting the quality of life and healthcare expenditure worldwide [1]. GERD is a condition that develops when the reflux of stomach contents causes troublesome symptoms and/or complications [2,3]. GERD is characterized primarily by typical symptoms such as heartburn and acid regurgitation, and the less frequent symptoms such as dysphagia, chest discomfort, water brash, odynophagia, burping, hiccups, nausea, and vomiting [4]. The spectrum of GERD ranges from non-erosive reflux disease (NERD) to reflux esophagitis and, in severe cases, Barrett's esophagus, highlighting its potential for long-term morbidity [2,3]. The prevalence rate of GERD is higher in western countries and lower in Asia. North America has the highest prevalence, 27.8%, while in Southeast Asia the prevalence was 7.4% [5]. The global, regional, and national burden of GERD has been increasing, posing a continuous challenge to public health systems [1].

The development and severity of GERD symptoms are influenced by a complex interplay of lifestyle, dietary, psychological, and physiological risk factors [6,7]. Extensive systematic reviews have established clear associations between GERD and specific lifestyle habits, including smoking, alcohol consumption, high-fat diets, and late-night eating [8,9]. Specific dietary components, such as caffeine, chocolate, citrus fruits, and spicy foods, are known to lower LES pressure or directly irritate the esophageal mucosa, thus exacerbating reflux symptoms [10,11].

Medical students are a profoundly vulnerable demographic for the development of stress-related and lifestyle-induced diseases, including GERD [7,12]. The transition into the clinical clerkship program (known locally as co-ass) represents an acute phase of high-demand training characterized by long hospital hours, irregular duty schedules, immense academic pressure, and exposure to emotionally demanding clinical scenarios [13]. These demanding conditions invariably lead to chronic stress, fragmented sleep, and compromised dietary choices [12]. It is common for medical students to adopt poor coping mechanisms, such as increased consumption of caffeine to sustain long study sessions, and reliance on quick, often high-fat or spicy, processed meals due to time constraints. These lifestyle shifts directly activate the documented risk factors for GERD [9,10]. The impact of GERD symptoms on this population is not merely physical; studies have documented a detrimental effect on the students' academic performance and overall quality of life [13]. This study aims to determine the prevalence of GERD symptoms using the GERD-Q instrument, among active medical clerkship students undergoing clinical rotation at Raden Mattaher Hospital, Jambi.

## METHODS

### *Study design and setting*

This is a cross-sectional study conducted in Raden Mattaher General Hospital Jambi as the main site for medical clerkship students of Faculty of Medicine and Health Universitas Jambi. The study was conducted from September to October 2025.

### *Population, samples and sampling*

The population for this study is all medical clerkship students who officially registered and actively participating in clinical rotations at Raden Mattaher Hospital during the study period (September–October 2025). A total sample size of 150 medical clerkship students was recruited through a purposive sampling technique. The inclusion criteria were active in clinical clerkship program and give consent to voluntarily fill the

questionnaire. The exclusion criteria are those who suffer from chronic digestive disorders other than dyspepsia and GERD.

### ***Instruments and criteria***

The GERD symptoms were obtained using the Gastroesophageal Reflux Disease Questionnaire (GERD-Q). This instrument is a six-item, patient-reported outcome measure specifically designed for the rapid and reliable identification of symptomatic GERD in primary care settings. The GERD-Q was developed and validated by Jones et al and has been used worldwide ever since to aid in the diagnosis, treatment, and research of GERD. The GERD-Q is highly valued for its non-invasive nature and ease of administration [14,15]. The six items of the GERD-Q are categorized into: 1) Positive Symptoms (4 items, scored 0–3): Relating to the frequency of heartburn, acid regurgitation, sleep disturbance due to symptoms, and use of non-prescription medication for relief. Higher scores indicate greater frequency and severity; and 2) Negative Symptoms (2 items, scored 5–0): Relating to the frequency of epigastric pain and nausea, which are less specific to GERD. The scoring is inverted for these items so that lower frequency contributes to a higher overall GERD-Q score, reflecting the diagnostic model's specificity (table 1) [14].

**Table 1.** The GERD questionnaire [14].

Question	Frequency score (points) for symptoms			
	0 day	1 day	2-3 days	4-7 days
1. How often did you have a burning feeling behind your breastbone (heartburn)?	0	1	2	3
2. How often did you have stomach contents (liquid or food) moving upwards to your throat or mouth (regurgitation)?	0	1	2	3
3. How often did you have a pain in the centre of the upper stomach?	3	2	1	0
4. How often did you have nausea?	3	2	1	0
5. How often did you have difficulty getting a good night's sleep because of your heartburn and/or regurgitation?	0	1	2	3
6. How often did you take additional medication for your heartburn and/or regurgitation, other than what the physician told you to take?	0	1	2	3

The total score for the GERD-Q ranges from a minimum of 0 to a maximum of 18. A composite score of  $\geq 8$  is the established cut-off point used to define the high likelihood of having GERD. The GERD-Q total score of 8 or more indicates 80% likelihood of having GERD, and in those with a total score of 3–7 indicates 50% likelihood of having GERD. Meanwhile the total score of 0–2 indicates 0% likelihood of having GERD [14].

### ***Procedure and data collection***

Data were collected using Google Form to facilitate a more flexible, wide and efficient way in distributing and filling the questionnaire. Informed consent was put on the first

section along with the assurance about the data confidentiality [5]. In collaboration with the class president and the heads of each clinical rotation, the Google Form link was sent to every student via private messages and WhatsApp groups to make sure the questionnaire was received and filled out.

### **Statistical analysis**

All raw data captured by the Google Form were exported and compiled into a master spreadsheet. Subsequent data analysis was performed using SPSS 26. The analytical strategy was primarily descriptive, focused on establishing the prevalence and characteristics of the GERD symptoms.

### **Ethical considerations**

The study was approved by the Ethics Committee of Faculty of Medicine and Health Sciences Universitas Jambi.

## **RESULTS**

A total of 150 medical clerkship students from Raden Mattaher General Hospital, Jambi, successfully completed the questionnaire. The mean age of the participants was calculated to be 22.97 years. The sample exhibited a female predominance, with the majority of respondents being female (n=103, 68.7%) compared to male (n=47, 31.3%). The most participants are in their first year, who started clinical clerkship in 2025 (n=73, 48.7%). The demographic characteristics of the study is shown in table 2.

**Table 2.** Demographic characteristics of the study

<b>Characteristics</b>	<b>n</b>	<b>%</b>	<b>mean (SD)</b>
<b>Gender</b>			
male	47	31.3	
female	103	68,7	
<b>Age</b>			22.97 (1.318)
21	15	10	
22	40	26.7	
23	53	35.3	
24	30	20	
25	8	5.3	
26	1	0.7	
27	1	0.7	
29	2	1.3	
<b>Year starting clinical clerkship</b>			
2020	1	0.7	
2021	3	2	
2022	2	1.3	
2023	14	9.3	
2024	57	38	
2025	73	48.7	
<b>Total Score of GERD-Q</b>			6.41 (1.818)
3	4	2.7	
4	12	8	
5	23	15.3	

6	56	37.3
7	23	15.3
8	18	12
9	6	4
10	5	3.3
12	1	0.7
14	1	0.7
15	1	0.7

The total GERD-Q scores among the 150 students ranged from a minimum of 3 to a maximum of 15. The mean GERD-Q score in this study was 6.41 (1.818). The primary finding of this study is to find the prevalence of GERD by applying the validated cut-off score of GERD-Q  $\geq 8$  for diagnosis of GERD, which was determined to be 21.3% (n=32). Conversely, the majority of the population, 78.7% (n=118), had GERD-Q scores below the diagnostic threshold (table 3)

**Table 3.** Prevalence of GERD in medical clerkship students

Categories	n	%
GERD	32	21.3
Not GERD	118	78.7
Total	150	100

The GERD-Q have different interpretation based on the range of the scores. Table 4 provides a detailed breakdown of the distribution of the individual GERD-Q scores across the entire sample to determine the likelihood of having GERD in this population. In table 4, all 78.7% participants who did not meet the score for being diagnosed with GERD had a 50% likelihood of having GERD.

**Table 4.** Distribution of GERD-Q score based on likelihood of having GERD

GERD-Q Score Range	Interpretation	n	%
0-2	0% likelihood of having GERD	0	0
3-7	50% likelihood of having GERD	118	78.7
8-18	80% likelihood of having GERD	32	21.3
Total		150	100

The frequency of specific GERD-Q symptoms reported by the entire sample (n=150) is summarized in table 5. The data revealed that nausea was the most frequently experienced symptom, followed by regurgitation and epigastric pain.

**Table 5.** Frequency of GERD-Q symptoms

GERD-Q Symptoms	n	%
<b>Positive Symptoms (Reflux-Specific)</b>		
Heartburn	60	40
Regurgitation	81	54
Sleep disturbance due to heartburn/regurgitation	30	20
Use of non-prescription medication (for relief)	58	38.7
<b>Negative Symptoms (Less Reflux-Specific)</b>		
Epigastric Pain	80	53.3
Nausea	96	64

## DISCUSSION

The primary finding of this cross-sectional study establishes the prevalence of symptomatic GERD among medical clerkship students at Raden Mattaher Hospital, Jambi, at 21.3% (n=32). This number is remarkably significant, indicating that over one-fifth of the clinical training population is currently burdened by troublesome and frequent reflux symptoms that meet the diagnostic criteria for GERD as defined by the GERD-Q [14].

This finding aligns closely with the body of international literature that has examined the prevalence of GERD within similar, high-stress academic environments. Specifically, the observed 21.3% prevalence is highly comparable to rates reported in geographically diverse medical student populations: a study in Oman found a prevalence of 20% [16]; research among undergraduate students in Baghdad reported a 22.6% prevalence [17]; and a nation-based study across Egypt found a comparable rate of 24.7% [18,19]. Other studies, such as those in India and Multan, documented rates of 26.7% and 18.7%, respectively [12,20,21]. This consistency strongly suggests that the intense, high-pressure environment inherent to medical training, irrespective of institutional or regional setting, is a universal determinant of increased GERD symptoms. The clinical clerkship phase, with its rigorous demands and chronic stress, appears to elevate the vulnerability of this specific cohort to a degree that supersedes typical demographic variation [13].

The elevated prevalence of GERD symptoms observed in this study confirms the designation of the medical clerkship student population as a high-risk group for gastrointestinal morbidity. The demands of clinical training necessitate a lifestyle that actively promotes the established risk factors for GERD. Furthermore, the high-stress academic and clinical load acts as a powerful psychological factor that exacerbates GERD [22,23]. Stress is known to alter gastrointestinal motility, increase gastric acid secretion, and heighten pain sensitivity in the esophagus. To cope with these pressures, students often adopt detrimental lifestyle habits [9]. This includes the consumption of trigger foods such as high-fat meals, spicy street food, and excessive caffeine at irregular times, often late at night following shifts, which directly contributes to LES relaxation and acid reflux [8,10]. Systematic reviews have documented the robust relationship between these dietary and lifestyle choices and the exacerbation of GERD, providing a strong contextual explanation for the prevalence found in this study [3,24].

While the 21.3% number identifies students with current, clinically defined symptomatic GERD (GERD-Q score  $\geq 8$ ), a critical analysis of the remaining 78.7% (n=118) of the population reveals a substantial hidden burden of risk. These students scored below the diagnostic threshold, but many of them still experience symptoms that are non-diagnostic yet impactful. As shown in Table 4, this group still has a 50% likelihood of having GERD. In this study, none of the students have a 0% likelihood of having GERD, in other words, all students are at risk of suffering from GERD.

The high rates of individual symptoms reported in our study 64% experiencing nausea and 54% experiencing regurgitation demonstrate that even students with a total GERD-Q score below 8 are frequently symptomatic. These high frequencies of individual symptoms confirm that a large portion of the 78.7% non-GERD group is experiencing gastrointestinal discomfort that places them directly on the trajectory toward clinically relevant GERD if their underlying lifestyle and stress factors are not addressed. Thus, the entire medical clerkship population should be considered a high-risk group that requires preventive intervention, rather than just the 21.3% who have crossed the symptomatic threshold. The presence of GERD symptoms, even at sub-

threshold levels, has a documented negative impact on the academic success and overall quality of life (QoL) of medical students [13].

The symptoms themselves—heartburn, regurgitation, and epigastric pain are distracting and can significantly impair concentration during lectures, study sessions, and clinical duties. The sleep disturbance (reported by 20% of our sample) is perhaps the most critical factor linking GERD to academic detriment [25,26]. Chronic lack of restorative sleep negatively affects cognitive function, memory consolidation, attention span, and mood, all of which are essential for effective clinical learning and high-stakes examination performance. A student suffering from GERD-related pain and sleep loss is fundamentally less equipped to absorb, recall, and apply complex medical knowledge than their asymptomatic peers. These symptoms also oftentimes lead to hospitalization, thus disrupting their academics and study period [13].

## CONCLUSIONS

This study revealed a substantial prevalence of GERD in active medical clerkship students at Raden Matta Her General Hospital Jambi, estimated at 21.3%. A significant proportion of the students not meeting this threshold, representing 78.7% of the population, are still considered at high risk for developing clinically relevant symptoms of GERD due to the demanding nature of the training environment and the high reported frequency of individual symptoms. This high prevalence, consistent with global trends in medical student populations, highlights the urgent need to address the compounding effects of stress, poor diet, and sleep disruption on student health, which will be the topic for the next phase of this research.

## CONFLICT OF INTEREST

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest

## FUNDING

This study was funded by LPPM Universitas Jambi, grant number 342/UN21.11/PT.01.05/SPK/2025.

## DECLARATION OF ARTIFICIAL INTELLIGENCE USE

This study used artificial intelligence (AI) tools and methodologies in the capacities of Manuscript writing support, such as Quillbot, to aid in language refinement (improving the grammar, sentence structure, and readability of the manuscript).

## REFERENCES

- [1] Zhang D, Liu S, Li Z, Wang R. Global, regional and national burden of gastroesophageal reflux disease, 1990–2019: update from the GBD 2019 study. *Ann Med* [Internet]. 2022;54(1):1372–84. <https://doi.org/10.1080/07853890.2022.2074535>
- [2] Fass R. Gastroesophageal reflux disease. *N Engl J Med* 2022;387:1207-16. DOI: 10.1056/NEJMcp2114026
- [3] Katz PO, Dunbar KB, Schnoll-Sussman FH, Greer KB, Yadlapati R, Spechler SJ. ACG clinical guideline for the diagnosis and management of gastroesophageal reflux disease. *Am J Gastroenterol.* 2022;117:27–56. <https://doi.org/10.14309/ajg.0000000000001538>.
- [4] Chhabra P, Ingole N. Gastroesophageal reflux disease (GERD): highlighting diagnosis, treatment, and lifestyle changes. *Cureus.* 2022;14(8): e28563. DOI 10.7759/cureus.28563

- [5] Zheng Z, Shang Y, Wang N, Liu X, Xin C, Yan X, et al. Current advancement on the dynamic mechanism of gastroesophageal reflux disease. *Int J Biol Sci.* 2021;17(15):4154–64. doi: 10.7150/ijbs.65066
- [6] Sadafi S, Azizi A, Pasdar Y, Shakiba E, Darbandi M. Risk factors for gastroesophageal reflux disease: a population-based study. *BMC Gastroenterol.* 2024;24(1):1–7. <https://doi.org/10.1186/s12876-024-03143-9>
- [7] Taraszewska A. Risk factors for gastroesophageal reflux disease symptoms related to lifestyle and diet. *Rocz Panstw Zakl Hig.* 2021;72(1):21–28. <https://doi.org/10.32394/rpzh.2021.0145>.
- [8] Priya. The impact of diet and lifestyle on gastroesophageal reflux disease ( GERD ): Current Insights. 2025;1(1):60–8.
- [9] Zhang M, Hou ZK, Huang ZB, Chen XL, Liu F Bin. Dietary and lifestyle factors related to gastroesophageal reflux disease: A systematic review. *Ther Clin Risk Manag.* 2021;17:305–23.
- [10] Khan M, Shah K, Gill SK, Gul N, Jestin KJ, Valladares V, et al. Dietary habits and their impact on gastroesophageal reflux disease ( GERD ). 2024;1 6(7): e65552. DOI 10.7759/cureus.65552.
- [11] Herdiana Y. Functional Food in Relation to Gastroesophageal Reflux Disease (GERD). *Nutrients.* 2023;15(16). <https://doi.org/10.3390/nu15163583>
- [12] Belete M, Tesfaye W, Akalu Y, Adane A, Yeshaw Y. Gastroesophageal reflux disease symptoms and associated factors among university students in Amhara region , Ethiopia , 2021 : a cross-sectional study. *BMC Gastroenterology (2023) 23:130* <https://doi.org/10.1186/s12876-023-02758-8> .
- [13] Alomair O, Alajlani A, Abu Mughaedh MAM, Almajed MM, Abu sinah AK, Ibrahim Ali S. Impact of Gastroesophageal Reflux Disease (GERD) Symptoms on the lifestyle and academic performance of medical students at King Faisal University. *Cureus.* 2023;15(12):1–8. <https://doi.org/10.7759/cureus.51261>.
- [14] Jones R, Junghard O, Dent J, Vakil N, Halling K, Wernersson B, et al. Development of the GerdQ, a tool for the diagnosis and management of gastro-oesophageal reflux disease in primary care. *Aliment Pharmacol Ther.* 2009;30(10):1030–8. doi:10.1111/j.1365-2036.2009.04142.x
- [15] Mukhlif. ZA, Alkhalidi NMF, Al-Rudaini RS. Association of Body Composition with GERD Risk in Medical Students: A Bioelectrical Impedance Analysis Study in Fallujah, Iraq. *Int J Res Publ Rev.* 2024;5(9):243–52. Doi : <https://doi.org/10.55248/gengpi.5.0924.2401>
- [16] Al-rudaini M, Al Farsi H, Anwar Z, Alwahshi A, Al Hinai R, Anwar S. Symptoms and Risk Factors of Gastroesophageal Reflux Disease Among Medical Students in Oman. *Int J Innov Res Med Sci.* 2024;9(04):182–6. DOI: 10.23958/ijirms/vol09-i04/1860.
- [17] Abdulwahhab SH, Al Hashimi BAR, Alkhalidi NM. Prevalence and associated factors of gastro-esophageal reflux disease among a sample of undergraduate medical students in Baghdad. *J Fac Med Baghdad.* 2022;63(4):163–70. <https://doi.org/10.32007/jfacmedbagdad.6341865>.
- [18] Baklola M, Terra M, Badr A, Fahmy FM, Elshabrawy E, Hawas Y. Prevalence of gastro-oesophageal reflux disease , and its associated risk factors among medical students : a nation-based cross- sectional study. *BMC Gastroenterology (2023) 23:269* <https://doi.org/10.1186/s12876-023-02899-w>.
- [19] Alotay A, Alhajery M, Alsultan KM, Alanazi RN, Saleh A, Alshabanat FB, et al. Prevalence

- of GERD symptoms and its related risk factors among medical students in Saudi Arabia. *J Pharm Bioall Sci* 2025;17:S861-4. DOI: 10.4103/jpbs.jpbs\_1552\_24.
- [20] Farooq M, Tahir M, Ali G, Anwar Z, Hussain G, Zainab M. Frequency and factors of gastro-esophageal reflux disease in medical college students in Multan. **Med Forum** 2024;35(11):155-159. doi:10.60110/medforum.351133.
- [21] Ramya Sree M, Kolli H, Periyasamy B, Praveen V. A cross-sectional study to evaluate the prevalence and risk factors of gastro-esophageal reflux disease among the undergraduate medical students of a tertiary-care Indian setting. *MGM J Med Sci*. 2023;10(1):102–5. DOI: 10.4103/mgmj.mgmj\_186\_22
- [22] Ahmed HAA, Yousef A, El-Kurdy R, Murad MA, Abdelwahab SM, Shiba HAA. Psychological factors, lifestyle habits, and their association with gastroesophageal reflux disease among Egyptian university students: A cross-sectional study. *Med (United States)*. 2024;103(47):e40477. <http://dx.doi.org/10.1097/MD.0000000000040477>
- [23] Alatawi HS, Alshaikh AA, Behairi MM, Alsudairy NM, Alshaikh JA. Prevalence and lifestyle factors associated with gastroesophageal reflux disease symptoms among adults in Saudi Arabia: a cross-sectional study. *Cureus*. 2025;17(4): e82997. DOI 10.7759/cureus.82997
- [24] Shaqran TM, Ismaeel MM, Alnuaman AA, Ahmad FA Al, Albalawi GA, Almubarak JN, et al. Epidemiology, causes, and management of gastro-esophageal reflux disease : a systematic review. *Cureus*. 2023; 15(10): e47420. DOI 10.7759/cureus.47420.
- [25] Tan X, Wang S, Wu F, Zhu J. Bidirectional correlation between gastroesophageal reflux disease and sleep problems: a systematic review and meta-analysis. *PeerJ*. 2024;12:e17202 DOI 10.7717/peerj.17202
- [26] Kurin M, Shibli F, Kitayama Y, Kim Y, Fass R. Sorting out the relationship between gastroesophageal reflux disease and sleep. *Curr Gastroenterol Rep*. 2021;23:15. <https://doi.org/10.1007/s11894-021-00815-4>.