

# Prevalence of Gastroesophageal Reflux Disease among Health Specialist Students in Makkah, Saudi Arabia

Mohannad T. Hemdi <sup>1</sup>, Abdulrahman F. Kabli <sup>2</sup>, Salah M. Bakry <sup>2</sup>, Khalid A. Alhazmi <sup>2</sup>, Suhayb M. Bakry <sup>2</sup>.

<sup>1</sup>Assistant professor, Department of Surgery, Faculty of Medicine, Umm Al-Qura University, Makkah, Saudi Arabia.

<sup>2</sup>Medical student, Faculty of Medicine, Umm Al-Qura University, Makkah, Saudi Arabia.

## ABSTRACT

**Background:** One of the most common gastrointestinal disorder in adults is gastroesophageal reflux disease (GERD). It is defined as a condition in which a reflux of gastric content causes symptoms and/or complications. The classical symptoms of GERD are heartburn, regurgitation, sore throat, and cough.

**Objectives:** The aim of this study is to measure the prevalence of GERD and determine the associated risk factors among health specialist students at Umm Al-Qura University (UQU) in Saudi Arabia.

**Methods:** A cross-sectional study was conducted using a self-administered survey distributed to students in health-related disciplines at UQU. The survey was disseminated via social-media platforms and 365 responses were received. The survey contained 23 different questions to assess the prevalence of GERD and ascertain if the disease is associated with multiple factors.

**Results:** A total of 365 students participated in this study. The mean age of participants was 21.6 years, and among the 365 participants, 116 (31.8%) were diagnosed with GERD based on the gastroesophageal reflux disease questionnaire (GERDQ) score. Other findings included that 24 (52.2%) students diagnosed with GERD were smokers ( $P>0.05$ ), 50 (40.0%) went to sleep one hour after dinner ( $P>0.05$ ), and 52 (44.4%) had a family history of GERD ( $P>0.05$ ).

**Discussion:** Multiple studies have been conducted regarding the prevalence of GERD in Saudi Arabia. One study in Riyadh found that 23% of the sample had GERD, while another one conducted in the south of the country found 40% with GERD.

**Conclusion:** There is an increased prevalence of GERD observed in this study. The main risk factors identified were smoking, family history of GERD, sleeping one hour after dinner, skipping breakfast, and inadequate sleep. There was no apparent association between GERD and different types of food and drinks.

**Keyword:** Gastroesophageal reflux disease, prevalence, risk factors, university students, Umm Al-Qura University.

## Introduction

One of the most common gastrointestinal disorder in adults is gastroesophageal reflux disease (GERD) [1]. GERD is a chronic disease characterized by regurgitation of gastric content into the esophagus, and it is vital to diagnose and treat the condition before exacerbation of its typical symptoms, which can reduce a patient's quality of life and cause complications [2]. The classical picture of GERD are

Regurgitation, heartburn, cough, and sore throat. Multiple factors are related to GERD, including analgesic intake, certain food and drink, smoking, family history, and others. Previous risk factors are connected and associated to the lifestyle of the patients [3]. Worldwide multiple studies have been conducted on GERD prevalence among university students, and while a few have been performed among Saudi health

Access this article online	
Quick Response Code:	Website: www.smh-j.com
	DOI: 10.54293/smhj.v2i1.122

**Address for correspondence:** Abdulrahman Fareed Kabli, Medical student, Faculty of Medicine, Umm Al-Qura University, Makkah, Saudi Arabia.

**E-mail:** [abdualrahmankabli@gmail.com](mailto:abdualrahmankabli@gmail.com)

**Received:** 18 November 2021 | **Accepted:** 29 January 2022

This is an open access article by SMHJ is licensed under Creative Commons Attribution 4.0 International License.

<https://creativecommons.org/licenses/by/4.0>

Please cite this article as: Alhazmi K, kabli abdualrahman, Bakry S, Bakry S, Hamdi MT. The Prevalence of Gastroesophageal Reflux Disease among Health Specialist Students in Makkah, Saudi Arabia: Prevalence of GERD among University students. SMHJ [Internet]. 2022;2(1):1-6.

## Prevalence of Gastroesophageal Reflux Disease among Health Specialist Students in Makkah, Saudi Arabia.

Care students, no studies have been conducted in Umm Al-Qura University (UQU) in Makkah city [4–7]. The majority of medical students who suffer from GERD do not seek medical attention because they either disregard the symptoms or self-medicate [8]. GERD can impair one's quality of life, affecting everyday activities, college attendance, and overall well-being. Consequently, we aimed to establish the distribution of GERD among young Saudi students in health-related disciplines at UQU, in addition to assessing the risk factors that are associated with GERD.

### Methods

This is a cross-sectional study conducted by using a questionnaire at UQU. An electronic survey made by Google forms was distributed through the social media platform WhatsApp for collection of data. There are over 4,100 students in health-related faculties at the university. To measure the prevalence and risk factors in a cross-sectional study with 95% confidence interval and 5% acceptable error margin and clustering effect of 1.2, we needed to survey at least 352 students. All students from other colleges or universities were excluded. To avoid response biases, a simple language was used to explain all questions, and participants were anonymous. All data were analyzed using IBM SPSS (Statistical Package for the Social Sciences) version 25 for Microsoft Windows. We calculated the sample size using Raosoft calculator, and the minimum sample size to establish a precision 95% confidence interval was 353 responses. The questionnaire was classified into three different parts: a section focusing on demographic information of the students, followed by one ascertaining risk factors, and finally the gastroesophageal reflux disease questionnaire (GERDQ), which was used to diagnose GERD [9]. The questionnaire included demographic characteristics, multiple lifestyle factors that might cause GERD, drawn from previous published Saudi studies. The GERDQ was used to diagnose students with GERD, it was validated as a patient-centered self-assessment. Those with a score of 8 or more were considered to have GERD, while those with a score of less than 8 were not considered to have this disease [9]. The questionnaire was distributed among students from December 2020 until January 2021. Questions from participants regarding the questionnaire was answered by the researchers. Participant's consent was obtained, and all answered the questionnaire of their own volition.

Ethical approval of this study was approved by the Ethics and Research Review Committee of Umm Al-Qura University, Faculty of Medicine (Approval number: HAPO-02-K-012-2021-02-536), Data of approval was 2/2/2021.

### Statistical analysis

The data were examined using acceptable statistical methods and SPSS version 25 software. For categorical data, frequency was computed; for age variables, mean and standard deviation were calculated. The Chi-square test was used to look for association between variables and GERD. Crosstabs were done to find the association of GERD with each independent variable, in order to assess potential risk factors, and a p-value of less than 0.05 was considered significant

### Results

Total of 365 responder participated in this study. Mean age of responders was 21.6 years, with the oldest responder 32 years and the youngest 18 years old. Most responses were from fifth-year students (122; 33.4%), and the least responses were from sixth-year students (21; 5.8%). Among the 365 responders, 206 (56.4%) were male and 159 (43.6%) were female. Responses from the College of Medicine were the highest with 295 (80.8%) responses, and the least were from the College of Nursing with six responses (1.6%) (Table 1).

Students were asked about bad habits, frequent consumption of different types of food and drink, and if they have any symptoms of GERD. Responses indicated that 46 (12.6%) students currently smoke, and 112 (30.7%) have a family history of GERD. Regarding drink consumption, 232 (63.6%) participants drink coffee, 180 (49.3%) drink tea, and 110 (30.1%) drink carbonated drinks.

To diagnose GERD, a questionnaire (GERQ Score) was used consisting of six questions, each of which had four possible answers. Each response correlated with a set score, and students who scored eight or more points were considered to have GERD (Table 2). Out of 365 participants, 116 (31.8%) were thus diagnosed, with the remaining 249 (68.2%) not suffering from GERD. Of the 116 students, 72 (35%) were male and 44 (27.7%) were female, while 24 (52.2%) smoked, 68 (30.1%) frequently consumed fast food, 57 (33.3%) ate spicy food, 78 (33.6%) drank coffee on a regular basis, and 61 (33.9%) drank tea (Table 3).

We found that smoking, family history of GERD, inadequate sleep, sleeping within one hour after meals, and skipping breakfast significantly correlated with GERD diagnosis ( $P > 0.05$ ). On the other hand, age, gender, eating snacks, and consuming different types of food and drink did not have any significance ( $p < 0.05$ ) (Table 4).

Prevalence of Gastroesophageal Reflux Disease among Health Specialist Students in Makkah, Saudi Arabia.

**Table 1:** Socio-demographic characteristics of the students.

Socio-demographic data		Freq %
Age (years) (mean [SD]) [range]	21.6 (2.04) [18-32]	
Gender	Male	206 (56.4%)
	Female	159 (43.6%)
Collage	Medicine	295 (80.8%)
	Dentistry	24 (6.6%)
	Applied medical sciences.	20 (5.5%)
	Pharmacy	20 (5.5%)
	Nurse	6 (1.6%)
Academic year	2nd year	98 (26.8%)
	3rd year	70 (19.2%)
	4th year	28 (7.7%)
	5th year	122 (33.4%)
	6th year	21 (5.8%)
	Intern	26 (7.1%)

**Table 2:** Frequency of different variables.

Variables	Freq (%)
Family history of GERD	112 (30.7%)
Smoking	46 (12.6%)
Inadequate sleep	117 (32.1%)
Skipping breakfast	199 (54.5%)
Sleeping one hour after dinner	125 (34.2%)
<b>Frequent consumption of:</b>	
Fast food	226 (61.9%)
Spicy food	171 (46.8%)
Fried food	219 (60%)
Coffee	232 (63.6%)
Tea	180 (49.3%)
Carbonated drinks	110 (30.1%)
Snacks	220 (60.3%)

Prevalence of Gastroesophageal Reflux Disease among Health Specialist Students in Makkah, Saudi Arabia.

**Table 3:** Symptomatic gastroesophageal reflux disease (GERDQ score).

<b>Variables</b>	<b>Freq (%)</b>
<b>How often do you have burning feeling behind your breastbone (heartburn) a week?</b>	
None	212 (54.4%)
1 day	95 (24.4%)
2 -3 days	62 (15.9%)
4 -7 days	21 (5.4%)
<b>How often do you have stomach contents moving upwards to your throat or mouth (regurgitation)?</b>	
None	215 (55.1%)
1 day	111 (28.5%)
2 -3 days	35 (9.0%)
4 -7 days	29 (7.4%)
<b>How often do you have pain in the center of the upper stomach?</b>	
None	257 (65.9%)
1 day	83 (21.3%)
2 -3 days	36 (9.2%)
4 -7 days	14 (3.6%)
<b>How often do you have nausea?</b>	
None	260 (66.7%)
1 day	73 (18.7%)
2 -3 days	45 (11.5%)
4 -7 days	12 (3.1%)
<b>How often do you have difficulty getting a good night's sleep because of your heartburn and/or regurgitation?</b>	
None	292 (74.9%)
1 day	60 (15.4%)
2 -3 days	26 (6.7%)
4 -7 days	12 (3.1%)
<b>How often do you take additional medication for your heartburn and/or regurgitation, other than what the physician told you to take?</b>	
None	335 (85.9%)
1 day	32 (8.2%)
2 -3 days	10 (2.6%)
4 -7 days	13 (3.3%)
<b>GERDQ Score</b>	
More than or 8	116 (31.8%)
Less than 8	249 (68.2%)

Prevalence of Gastroesophageal Reflux Disease among Health Specialist Students in Makkah, Saudi Arabia.

**Table 4:** Variables and the association with GERD.

Characteristics	GERD (n=116)	No GERD (n=249)	P
Age (years) mean [SD]	21.7 [1.8]	21.5 [2.1]	0.445
Gender – M:F (%)	72 (35.0%):44 (27.7%)	134 (65.0%):115 (72.3%)	0.143
Smoking	24 (52.2%)	22 (47.8%)	0.002
Family history of GERD	52 (46.4%)	60 (53.6%)	0.000
Inadequate sleep	52 (44.4%)	65 (55.6%)	0.000
Eating snacks	73 (33.2%)	147 (66.8%)	0.493
Skip breakfast	73 (36.7%)	126 (63.3%)	0.032
Sleep one hour after dinner	50 (40.0%)	75 (60.0%)	0.018
Frequent consumption of			
Fast food	68 (30.1%)	158 (69.9%)	0.418
Spicy food	57 (33.3%)	114 (66.7%)	0.574
Fried food	68 (31.1%)	151 (68.9%)	0.732
Coffee	78 (33.6%)	154 (66.4%)	0.351
Tea	61 (33.9%)	119 (66.1%)	0.432
Carbonated drinks	41 (37.3%)	76 (62.7%)	0.144

### Discussion

As a prevalent gastrointestinal disorder that affects adults worldwide, GERD is considered a major burden among adults, one that increases over time [10]. In our study, 32.8% of our student sample were diagnosed with GERD, and we observe that these results are higher than those reported in some other studies performed in other universities in Saudi Arabia and

also in India [4, 5, 6, 7]. Multiple studies have been conducted regarding the prevalence of GERD in Saudi Arabia. One study in Riyadh found that 23% of the sample had GERD, while another one conducted in the south of the country found 40% with GERD. In contrast, a Shaqra University study found only 2% of students have GERD. Another study, which discussed the prevalence of GERD in the general population in comparison with a university population, found that university students have a higher incidence of the disease than the general population [5, 11]. This could be due to stress, high caffeine intake, and the lack of time to eat healthily or workout. Regarding GERD and gender, in our study more male students were diagnosed with GERD than female students, although this difference was not statistically significant. We expected that age would not be associated with GERD because of the young age of our sample, but in studies conducted on the general population, a significant association was found between age and the disease [5, 12]. In this study, we found that smoking, inadequate sleep, skipping breakfast, and sleeping one hour after dinner were significantly associated with GERD. This might be due to poor lifestyle habits of students, as they tend to experience high stress due to exams and so on and lack the time to change their bad habits. Multiple other studies revealed the same result, suggesting that poor lifestyle has a huge effect on GERD symptoms [4–6, 11]. This could affect students in the future and have dangerous complications, including esophagitis, gastrointestinal bleeding, or even Barrett's esophagus. We observed a significant association between family history and GERD, a finding also reported in other studies. This association could be due to a genetic disposition or the familial sharing of similar lifestyles [5, 13]. In contrast, spicy, fast, or fried foods did not have a significant association with GERD in this study, in keeping with some other studies but in contrast with others. Drinks like coffee, tea, and carbonated beverages also did not have a relationship with GERD in our study.

### Conclusion

The main identified risk factors for GERD were smoking, family history of the disease, sleeping one hour after dinner, skipping breakfast, and inadequate sleep. The study also revealed that GERD is not associated with age, gender, and consumption of different types of food and drink. The prevalence of GERD in this study was higher in comparison to studies done in different universities. Since the prevalence of GERD is considered more higher in students than the general population, eating healthy

## Prevalence of Gastroesophageal Reflux Disease among Health Specialist Students in Makkah, Saudi Arabia.

food, consuming breakfast, doing regular exercises, and eating dinner three hours or more before sleep are recommended to avoid GERD and its complications. Further studies should be done to evaluate other risk factors and to determine definitive associations. Also, we recommend rising awareness of GERD among students as this disease have a great affect of the well-being of the community and might affect students' level in university.

### Conflict of Interest

None

### Funding

None

### References

1. Vakil N, Van Zanten S V., Kahrilas P, Dent J, Jones R, Bianchi LK, et al. The Montreal definition and classification of gastroesophageal reflux disease: A global evidence-based consensus. *Am J Gastroenterol* [Internet]. 2006;101. Available from: <https://pubmed.ncbi.nlm.nih.gov/16928254/>
2. Shaheen NJ, Hansen RA, Morgan DR, Gangarosa LM, Ringel Y, Thiny MT, et al. The burden of gastrointestinal and liver diseases. *Am J Gastroenterol* [Internet]. 2006;101:38-2128. Available from: <https://pubmed.ncbi.nlm.nih.gov/16848807/>
3. Clarrett DM, Hachem C. Gastroesophageal refl ux disease aff ects millions of people worldwide with signifi cant clinical implicati ons. *Mo Med* [Internet]. 2018;115:214. Available from: <https://pubmed.ncbi.nlm.nih.gov/31140167/>
4. Nadwa E, Alhablani F, Alruwaili R, Aldaghmi R, Alfallaj M. Gastroesophageal reflux disease among students of Jouf University, Sakaka, Saudi Arabia. *Int J Med Dev Ctries*. 2020;9-1144.
5. Alrashed A, Aljammaz K, Pathan A, Mandili A, Almatrafi S, Almotire M, et al. Prevalence and risk factors of gastroesophageal reflux disease among Shaqra University students, Saudi Arabia. *J Fam Med Prim Care* [Internet]. 2019;8:462. Available from: <http://www.jfmpc.com/text.asp?2019/8/2/462/253055>
6. Sharma A, Sharma PK, Puri P. Prevalence and the risk factors of gastro-esophageal reflux disease in medical students. *Med J Armed Forces India* [Internet]. 2018;74:4-250. Available from: <https://pubmed.ncbi.nlm.nih.gov/3081271/>
7. Arivan R, Deepanjali S. Prevalence and risk factors of gastro-esophageal reflux disease among undergraduate medical students from a southern Indian medical school: A cross-sectional study. *BMC Res Notes*. 2018;11.
8. Ofman JJ. The economic and quality-of-life impact of symptomatic gastroesophageal reflux disease. *Am J Gastroenterol* [Internet]. 2003;98. Available from: <https://pubmed.ncbi.nlm.nih.gov/12644026/>

9. 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;30:8-1030. Available from: <https://pubmed.ncbi.nlm.nih.gov/19737151/>
10. Dirac A, Naghavi M. The global, regional, and national burden of gastro-oesophageal reflux disease in 195 countries and territories, 1990â€“2017: a systematic analysis for the Global Burden of Disease Study 2017. *Artic Lancet Gastroenterol Hepatol* [Internet]. 2020;5:81-561. Available from: [www.thelancet.com/gastrohep](http://www.thelancet.com/gastrohep)
11. Arivan R, Deepanjali S. Prevalence and risk factors of gastro-esophageal reflux disease among undergraduate medical students from a southern Indian medical school: A cross-sectional study. *BMC Res Notes* [Internet]. 2018;11:448. Available from: <https://bmresnotes.biomedcentral.com/articles/10.1186/s13104-018-3569-1>
12. Kariri AM, Darraj MA, Wassly A, Arishi HA, Lughbi M, Kariri A, et al. Prevalence and Risk Factors of Gastroesophageal Reflux Disease in Southwestern Saudi Arabia. *Cureus* [Internet]. 2020;12. Available from: <https://www.cureus.com/articles/25967-prevalence-and-risk-factors-of-gastroesophageal-reflux-disease-in-southwestern-saudi-arabia>
13. Zhang H, Gao W, Wang L, Suzhen S, Gao Y, Liu B, et al. A population-based study on prevalence and risk factors of gastroesophageal reflux disease in the Tibet Autonomous Region, China. *PeerJ* [Internet]. 2019;2019. Available from: <https://pubmed.ncbi.nlm.nih.gov/3397765/>