Scientific Research Publishing

Open Journal of Gastroenterology, 2025, 15(10), 615-631
https://www.scirp.org/journal/ojgas
ISSN Online: 2163-9469
ISSN Print: 2163-9450

Prevalence and Associated Factors of Gastroesophageal Reflux among Students at Lédéa Bernard Ouédraogo University in 2025

Zanga Damien Ouattara[1*], Latif Sabane Ouedraogo[1], Siebou Hien[2], Steve Léonce Zoungrana[1], Mali Koura[3], Elias Dah[4], Solo Traoré[5], Appolinaire Sawadogo[3]

[1]Department of Gastroenterology, Regional Teaching Hospital of Ouahigouya, Ouahigouya, Burkina Faso
[2]Department of Nephrology, Regional Teaching Hospital of Ouahigouya, Ouahigouya, Burkina Faso
[3]Department of Gastroenterology, Souro Sanou Teaching Hospital of Bobo-Dioulasso, Bobo-Dioulasso, Burkina Faso
[4]Department of Public Health, Regional Teaching Hospital of Ouahigouya, Ouahigouya, Burkina Faso
[5]Department of Internal Medicine, Regional Teaching Hospital of Ouahigouya, Ouahigouya, Burkina Faso
Email: *damzang@gmail.com

How to cite this paper: Ouattara, Z.D., Ouedraogo, L.S., Hien, S., Zoungrana, S.L., Koura, M., Dah, E., Traoré, S., and Sawadogo, A. (2025) Prevalence and Associated Factors of Gastroesophageal Reflux among Students at Lédéa Bernard Ouédraogo University in 2025. *Open Journal of Gastroenterology*, **15**, 615-631.
https://doi.org/10.4236/ojgas.2025.1510057

Received: September 14, 2025
Accepted: October 17, 2025
Published: October 20, 2025

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Abstract

Introduction: Gastroesophageal reflux (GERD) is a common digestive disorder with increasing prevalence among young adults. It can significantly impact quality of life and lead to various complications. In West Africa, research on this condition within university settings remains limited. **Objective:** This study aims to evaluate the prevalence of GERD among students at Lédéa Bernard Ouédraogo University (ULBO) and to identify associated risk factors. **Methodology:** A cross-sectional, descriptive, and analytical study was conducted from April 1 to June 30, 2025, involving 432 students from ULBO. Data were collected through an online self-administered questionnaire. Statistical analyses were performed using SPSS 26, including Chi^2 tests, Fisher's exact test, and logistic regressions. **Results:** The prevalence of GERD was found to be 25.5%. The significantly associated factors included regular consumption of coffee/tea or carbonated beverages (ORa = 12.79; p = 0.036), fatty, spicy, or acidic meals (ORa = 18.83; p = 0.032), the habit of lying down after meals (ORa = 2.92; p = 0.020) and personal or family history of digestive diseases affecting the esophagus and stomach. The educational unit was also significantly associated (p = 0.002). **Conclusion:** GERD is a prevalent condition among students at ULBO, affecting approximately one in four students. Dietary habits and lifestyle choices influence this condition, necessitating awareness campaigns and the promotion of healthy eating habits to improve students' health.

Keywords

Gastroesophageal Reflux, Students, Prevalence, Risk Factors, Burkina Faso

1. Introduction

Gastroesophageal reflux (GERD) is a common condition of the upper digestive tract, typically manifesting as a combination of retrosternal burning or pyrosis and food regurgitation. It may or may not be accompanied by postural syndrome, and in some cases, it can lead to complications, including damage to the esophageal mucosa [1]. This condition results from dysfunction of the anti-reflux mechanism or exacerbating factors such as motility disorders that cause abnormal passage of gastric contents into the esophagus [2]. The literature presents disparate data with significant regional variations. Prevalence generally ranges from 10% to 30%, with higher rates reported in North America (18.1% - 27.8%) and the Middle East (8.7% - 33.1%), while remaining lower in East Asia (2.5% - 7.8%). Europe, South America, and Australia show intermediate rates, ranging from 8.8% to 25.9% [3]. In Africa, data are mainly hospital-based and often derived from endoscopic series, showing variable prevalence from 28% in Burkina Faso to 59.7% in Guinea [4] [5]. In any case, as highlighted by Shaqran *et al.* [6] millions of people worldwide are affected by GERD, and individuals of all ages are concerned, with a particular predominance among young adults. This condition is influenced by several factors, including lifestyle, dietary habits, obesity [7], and stress [8]. Students represent a population particularly exposed to these factors. A cross-sectional study conducted in July 2011 among 400 students at the University of Burundi estimated the prevalence of GERD at 27.8%, with frequent episodes reported in 21% of cases [9]. Additionally, the student population may exhibit specific eating habits and higher consumption of tobacco [10], alcohol, and coffee [11], along with elevated levels of academic stress [12], which may contribute to the emergence of GERD symptoms [13].

Ouahigouya, a city in northern Burkina Faso facing significant security challenges, has been home to Lédéa Bernard Ouédraogo University (ULBO) since 2010, offering three training programs: Medicine (UFR/SS), Sciences and Technology (UFR/ST), and Training and Development for Professions (IFPM). The socio-economic environment, stress related to security issues, and academic pressure could create a favorable context for the presence of GERD among this student population. However, no local data is available to assess the magnitude of the phenomenon, its modalities, and its determinants, which limits the implementation of targeted preventive actions. Therefore, we initiated this study, the first of its kind at the national level focused on students, to document the reality of GERD in this particular student context. Our aim was to determine the prevalence of GERD among ULBO students in 2025 and to identify the associated risk factors.

2. Method

This was a cross-sectional study with descriptive and analytical aims, conducted over a period of 3 months, from April 1 to June 30, 2025.

Study Population

The study involved students enrolled at Lédéa Bernard Ouédraogo University

for the 2024-2025 academic year.

Inclusion and Exclusion Criteria

- **Inclusion Criteria:** We included students registered at ULBO for the 2024-2025 academic year who consented to participate in the study.
- **Exclusion Criteria:** Exclusions were made for students who refused participation and for students' data that had incomplete, inconsistent, or unusable responses.

Sampling

Sampling was conducted using a non-probabilistic convenience approach, through a call for participation disseminated on digital platforms of the cohorts (WhatsApp groups), as well as by visiting frequented places around the university (cafeteria, library, classrooms, etc.). The minimum sample size was estimated using Schwartz's formula [14]:

$$n = Z^2 . p\,(1 - P) / d^2$$

where:

- n is the minimum sample size,
- $Z = 1.96$ for a 95% confidence interval,
- $p = 0.28$ (the prevalence of GERD reported in Ouagadougou in 2005 [4],
- d = desired precision (5% or 0.05).

Using these values, the minimum sample size was estimated at 310 students.

Study Variables and Operational Definitions

Variables

The collected information included:

- Sociodemographic characteristics of students (age, sex, marital status, type of cohabitation, training unit, level of study).
- Behavioral and lifestyle data related to tobacco, alcohol, soft drink consumption, fatty or acidic foods, physical activity, sleep habits, and levels of academic stress.
- Clinical data regarding personal and family histories of digestive, metabolic, or chronic diseases.
- Clinical data concerning GERD symptoms, their frequency, and the use of medications for relief.

Operational Definitions

In this study:

- GERD diagnosis was based on self-reported symptomatic criteria, in line with common epidemiological approaches. A student was considered to have GERD if at least one of the following typical symptoms was present: pyrosis and/or acid regurgitation, occurring at a frequency of at least once per week. Based on this definition, a binary variable titled "Presence of GERD" was created for statistical analyses.
- Fatty meals are defined as meals containing a significant proportion of fats, typically derived from fried foods, fatty meats, rich sauces (such as oils or cooked butters), or full-fat dairy products. These meals are commonly found

in Burkina Faso's cuisine through dishes such as "riz gras", "tô" accompanied by oily sauces (peanut, okra, etc.), or abundant frying (doughnuts, fried fish).

- Spicy meals refer to dishes containing substantial amounts of hot or strongly aromatic spices such as chili, ginger, garlic, pepper, or cloves. Their use is frequent in local cooking, both for preservation and flavor.
- Acidic meals include foods or preparations that have a low pH, such as citrus fruits (like lemon or orange), tomatoes, or acidic juices (juice from tamarind, baobab, etc.).
- Rarely corresponds to a frequency of at most once a week.
- Sometimes corresponds to a frequency of 2 to 3 times a week.
- Often corresponds to a frequency of 4 to 6 times a week.

Data Collection Tools and Techniques

Data collection was carried out using an online self-administered questionnaire designed via the KoboToolbox platform. This questionnaire was adapted to our context and was inspired by multiple questionnaires [15]-[17] available in the literature. However, studies regarding its sensitivity, specificity, and accuracy have not been the subject of locally validated work. We preferred this questionnaire to validated tools such as the frequency scale for the symptoms of GERD (FSSG). The questionnaires are more manageable, easier to understand, and allow for the consideration of atypical manifestations of GERD. Their efficacy for diagnosing GERD is also reported in the literature. Meanwhile, the validated scores have not undergone validation studies in our context, and their superiority over questionnaires is controversial [16] [18] [19].

The questionnaire was intended to be filled out directly by students enrolled at ULBO, constituting the target population of the study. To ensure an adequate understanding of the survey's content and objectives, the first phase involved visiting the different cohorts of the training units to present the study's purpose, explain the participation process, and address any questions. Subsequently, a link to the electronic questionnaire was generated via KoboToolbox and sent directly to the representatives of each cohort. They were responsible for relaying the link on their cohort's WhatsApp groups, allowing all relevant students to freely access the questionnaire. Students were invited to complete the questionnaire anonymously and voluntarily, according to their availability, over a four-week period.

Furthermore, to ensure the survey's accessibility to all students, including those facing technical difficulties or without access to digital platforms such as WhatsApp, paper versions of the questionnaire were also made available. These non-digital forms were distributed to the representatives of each cohort during visits to the university premises. Concerned students were able to fill out the questionnaire manually, under the same conditions of anonymity and confidentiality. Responses collected on paper were then manually entered into the electronic database on KoboToolbox by members of the research team.

Data Processing and Analysis

Statistical analyses were performed using IBM SPSS Statistics software, version

26.0, with a significance threshold set at $p < 0.05$. The analysis followed a multi-step approach: descriptive, univariate, and then multivariate, in accordance with methodological standards in analytical epidemiology.

Ethical and Deontological Aspects

Prior approval for the study was requested and obtained from the administrative and academic authorities of ULBO. An official authorization was issued for the implementation of data collection among students from the various training units involved.

Student participation was based on voluntary engagement, following clear and comprehensible information about the study's objectives, modalities, and implications. Informed, explicit, and voluntary consent was required from each participant before submitting the questionnaire.

3. Results

Distribution of the Study Population

Figure 1 below illustrates the distribution of the study population.

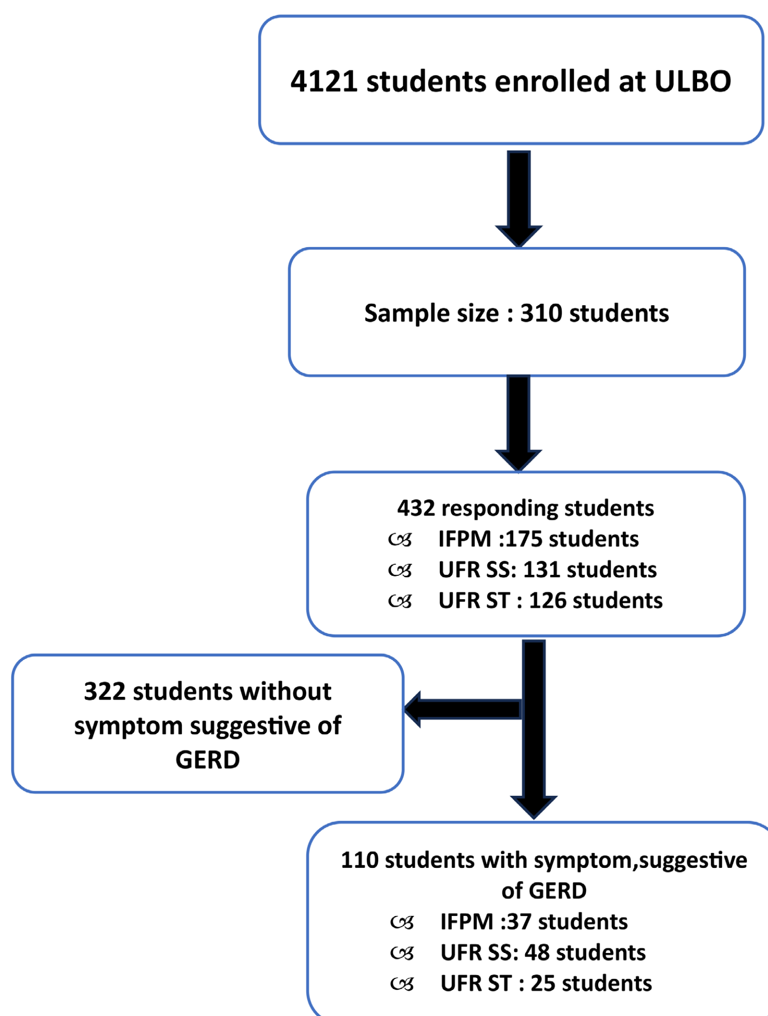

Figure 1. Distribution of the study population.

Prevalence of GERD at ULBO

Out of a total of 432 responding students, 110 exhibited symptoms suggestive of GERD, resulting in an overall prevalence of 25.5% (110/432).

Sociodemographic Characteristics of Students with GERD

In our study, the average age of the students was 22.31 ± 2.76 years, with age extremes ranging from 18 to 32 years. The male population was more represented, accounting for 53.6% of the students, compared to 46.4% female, resulting in a sex ratio of 1.15. The majority of students exhibiting GERD symptoms were single, representing 93.6% of the population. Married students constituted 5.5%, while 0.9% were widows or widowers. Participants reported living alone in 40% of cases, with family in 33.6%, and in shared accommodations in 26.4% of cases. Most students came from UFR/SS (43.6%), followed by IFPM (33.6%) and UFR/ST (22.7%). The most represented study levels were License 2 (25.5%), followed by License 3 (24.5%), and License 1 (22.7%). Students in Master 1 and 2 comprised 3.6% and 6.4%, respectively.

Lifestyle Habits of Students with GERD

In our study, 6.4% of students reported tobacco use and 22.7% reported alcohol consumption. The majority of students (80%) reported regularly consuming coffee, tea, or carbonated drinks. Approximately 90.9% reported consuming fatty, spicy, or acidic foods, known for their potential irritant effects on the esophageal mucosa. More than half of the participants (68.2%) consumed chocolate, with 48.2% doing so occasionally. Additionally, 85.5% of students had the habit of lying down or resting within two to three hours after a meal. Regarding physical activity, 60.9% of students reported engaging in regular exercise.

The following table (Table 1) illustrates the lifestyle habits of participants with GERD.

Table 1. Distribution of students with GERD according to different lifestyle habits.

Frequency of Consumption	Frequency (n)	Percentage (%)
Coffee, Tea, or Carbonated Drinks		
No consumption	22	20.0
Sometimes	36	32.7
Rarely	28	25.5
Often	23	20.9
Every day	1	0.9
Total	110	100.0
Fatty, Spicy, or Acidic Meals		
No consumption	10	9.1
Sometimes	54	49.1
Rarely	13	11.8
Often	32	29.1

Continued

Every day	1	0.9
Total	110	100.0
Chocolate		
No consumption	35	31.8
Sometimes	14	12.7
Rarely	53	48.2
Often	7	6.4
Every day	1	0.9
Total	110	100.0
Frequency of Habit Lying Down Soon After a Meal		
No consumption	16	14.5
Sometimes	29	26.4
Rarely	5	4.5
Often	39	35.5
Every day	21	19.1
Total	110	100.0
Frequency of Physical Activity		
No activity	43	39.1
Sometimes	29	26.4
Rarely	18	16.4
Often	18	16.4
Every day	2	1.8
Total	110	100.0

Clinical Data of Students with GERD

The most frequently reported personal medical history included digestive disorders (MUGD) at 17.3%, followed by GERD at 7.3%. The most common family medical histories were also digestive disorders (31.8%), followed by GERD (10.9%).

The main symptoms indicative of GERD identified in the study population were pyrosis and regurgitation. Among this population, 70.0% reported experiencing pyrosis, and 73.6% stated they had regurgitations. Notably, 48 students, or 43.6%, presented with both pyrosis and regurgitations.

The most frequent atypical symptoms were nighttime cough and bad breath, as well as voice hoarseness, representing 31.8% and 20%, respectively. All non-specific symptoms are summarized in the following tables (**Tables 2-5**).

Table 2. Distribution of students with GERD according to non-specific symptoms of GERD.

Symptoms	Present, n (%)	Absent, n (%)
Dysphagia	13 (11.8)	97 (88.2)
Odynophagia	11 (10.0)	99 (90.0)
Frequent burping	18 (16.4)	92 (83.6)
Nausea/Vomiting	21 (19.1)	89 (80.9)
Voice hoarseness	22 (20.0)	88 (80.0)
Persistent cough	6 (5.5)	104 (94.5)
Bad breath or acid mouth	35 (31.8)	75 (68.2)
Nocturnal cough while lying down	35 (31.8)	75 (68.2)

n = frequency; % = percentage.

Symptomatic students reported rare symptoms in 46.4% of cases, while 10% experienced symptoms 4 to 6 times per week.

Factors Associated with GERD

Univariate analysis using logistic regression revealed a statistically significant association between GERD and several variables, with a significance threshold of $p < 0.05$. The tables below present the results of the univariate analysis of factors associated with GERD among students, including frequencies and corresponding p-values.

Table 3. Univariate analysis of sociodemographic factors associated with GERD.

Characteristics	GERD No (n = 322)	GERD Yes (n = 110)	p-value
Sex			0.522
Female	138 (42.9)	51 (46.4)	
Male	184 (57.1)	59 (53.6)	
Marital Status			0.700
Single	301 (93.5)	103 (93.6)	
Married	20 (6.2)	6 (5.5)	
Widow	1 (0.3)	1 (0.9)	
Type of Cohabitation			0.163
Shared	109 (33.9)	29 (26.4)	
Family	114 (35.4)	37 (33.6)	
Alone	99 (30.7)	44 (40.0)	
Training Unit			0.002
IFPM	138 (42.9)	37 (33.6)	
UFR/SS	83 (25.8)	48 (43.6)	

Continued

UFR/ST	101 (31.4)	25 (22.7)	
Education Level			0.040
Doctorate 1	7 (2.2)	8 (7.3)	
Doctorate 2	13 (4.0)	11 (10.0)	
License 1	80 (24.8)	25 (22.7)	
License 2	105 (32.6)	28 (25.5)	
License 3	85 (26.4)	27 (24.5)	
Master 1	14 (4.3)	4 (3.6)	
Master 2	18 (5.6)	7 (6.4)	

[1]p-value from Fisher's exact test.

Table 4. Univariate analysis of behavioral factors associated with GERD.

Characteristics	GERD No (n = 322)	GERD Yes (n = 110)	p-value
Alcohol			0.003
Yes	36 (11.2)	25 (22.7)	
No	286 (88.8)	85 (77.3)	
Tobacco			0.316
Yes	15 (4.6)	7 (6.4)	
No	307 (95.4)	103 (93.6)	
Coffee/Tea/Carbonated Drinks			0.002
Yes	205 (63.7)	88 (80.0)	
No	117 (36.3)	22 (20.0)	
Fatty/Spicy/Acidic Meals			<0.001
Yes	216 (67.1)	100 (90.9)	
No	106 (32.9)	10 (9.1)	
Chocolate			<0.001
Yes	132 (41.0)	75 (68.2)	
No	190 (59.0)	35 (31.8)	
Lying Down After Meals			<0.001
Yes	212 (65.8)	94 (85.5)	
No	110 (34.2)	16 (14.5)	
Sleep Disorders			<0.001
Yes	50 (15.5)	43 (39.1)	
No	272 (84.5)	67 (60.9)	
High Academic Stress (EVA > 7)			0.001

Continued

Frequency of Coffee/Tea/Carbonated Drinks			0.002
Sometimes	79 (24.5)	36 (32.7)	
Rarely	71 (22.0)	28 (25.5)	
Often	39 (12.1)	23 (20.9)	
Every Day	16 (5.0)	1 (0.9)	
Frequency of Fatty/Spicy/Acidic Meals			<0.001
Sometimes	125 (38.8)	54 (49.1)	
Rarely	39 (12.1)	13 (11.8)	
Often	48 (14.9)	32 (29.1)	
Every Day	4 (1.2)	1 (0.9)	
Frequency of Chocolate			<0.001
Sometimes	27 (8.4)	14 (12.7)	
Rarely	100 (31.1)	53 (48.2)	
Often	4 (1.2)	7 (6.4)	
Every Day	1 (0.3)	1 (0.9)	
Frequency of Lying Down After Meals (<2 - 3 h)			<0.001
Sometimes	84 (26.1)	29 (26.4)	
Rarely	27 (8.4)	5 (4.5)	
Often	76 (23.6)	39 (35.5)	
Every Day	25 (7.8)	21 (19.1)	
Frequency of Physical Activity			0.247
Sometimes	92 (28.6)	29 (26.4)	
Rarely	55 (17.1)	18 (16.4)	
Often	28 (8.7)	18 (16.4)	
Every Day	10 (3.1)	2 (1.8)	

[1]p-value derived from Fisher's exact test.

Table 5. Univariate analysis of personal and family clinical factors associated with GERD.

Characteristics	GERD No (n = 322)	GERD Yes (n = 110)	p-value
Personal History of Digestive Disorders (MUGD)			<0.001
Yes	11 (3.4)	19 (17.3)	
No	311 (96.6)	91 (82.7)	
Personal History of Hiatal Hernia			0.161[1]
No	321 (99.7)	108 (98.2)	
Yes	1 (0.3)	2 (1.8)	

Continued

Personal History of Obesity			0.073[1]
No	319 (99.1)	106 (96.4)	
Yes	3 (0.9)	4 (3.6)	
Chronic Respiratory Disease			0.284[1]
No	316 (98.1)	106 (96.4)	
Yes	6 (1.9)	4 (3.6)	
Family History of Esophagitis			0.161[1]
No	321 (99.7)	108 (98.2)	
Yes	1 (0.3)	2 (1.8)	
Family History of Esophageal or Stomach Cancer			0.013[1]
No	320 (99.4)	105 (95.5)	
Yes	2 (0.6)	5 (4.5)	
Family History of GERD			<0.001
Yes	6 (1.9)	12 (10.9)	
No	316 (98.1)	98 (89.1)	
Family History of Digestive Disorders (MUGD)			<0.001
Yes	44 (13.7)	35 (31.8)	
No	278 (86.3)	75 (68.2)	
Family History of Hiatal Hernia			0.004
Yes	3 (0.9)	6 (5.5)	
No	319 (99.1)	104 (94.5)	

[1]p-value derived from Fisher's Exact Test.

The multivariate analysis after adjustment identified several variables independently associated with GERD (**Table 6**). Eight factors showed a statistically significant association with GERD:

- UFR/SS (p = 0.015)
- Habit of lying down after meals (p = 0.007)
- Presence of sleep disorders (p = 0.001)
- Personal history of MUGD (p = 0.012)
- Family history of GERD (p = 0.031)
- Frequent consumption (often) of coffee, tea, or carbonated beverages (p = 0.036)
- Frequent consumption (often) of fatty, spicy, or acidic meals (p = 0.032)
- Sometimes lying down after meals (p = 0.020).

Collinearity among the factors was assessed, and the variance inflation factor was found to be less than 5.

Table 6. Multivariate analysis of factors associated with GERD.

Variables	Adjusted OR [95% CI]	p-value
UFR/SS	3.54 [1.29 - 9.74]	0.015
UFR/ST	1.74 [0.84 - 3.60]	0.137
Doctorate 1	1.04 [0.20 - 5.47]	0.960
Doctorate 2	1.26 [0.31 - 5.11]	0.745
License 1	1.27 [0.33 - 4.86]	0.727
License 2	1.25 [0.31 - 5.12]	0.756
Master 1	0.27 [0.04 - 1.73]	0.168
Alcohol Consumption	0.66 [0.32 - 1.34]	0.245
Consumption of Coffee/Tea/Energy Drinks	8.28 [0.77 - 89.42]	0.082
Fatty/Spicy/Acidic Meals	5.45 [0.35 - 84.40]	0.226
Chocolate	0.39 [0.01 - 10.61]	0.575
Lying Down After Meals (<2 - 3 h)	3.89 [1.45 - 10.42]	0.007
Sleep Disorders	2.86 [1.56 - 5.26]	0.001
High Academic Stress (VAS > 7, Ref: No)	1.11 [0.95 - 1.29]	0.181
Personal History of Digestive Disorders (MUGD)	4.33 [1.51 - 12.50]	0.012
Family History of GERD	4.46 [1.14 - 17.54]	0.031
Family History of Hiatal Hernia	1.14 [0.169 - 7.619]	0.897
Family History of Digestive Disorders (MUGD)	0.59 [0.272 - 1.287]	0.186
Frequent Consumption of Coffee/Tea/Energy Drinks (often)	12.79 [1.18 - 139.06]	0.036
Frequent Consumption of Fatty/Spicy/Acidic Meals (often)	18.83 [1.29 - 275.23]	0.032
Lying Down After Meals (sometimes)	2.92 [1.19 - 7.15]	0.020

- **Adjusted OR**: Adjusted Odds Ratio
- **95% CI**: 95% Confidence Interval
- **p-value**: Statistical significance

4. Discussion

- **Limitations and Constraints of the Study**

Our study has limitations that should be noted. First, the cross-sectional nature of this study does not allow for the establishment of a causal relationship between the identified factors and the occurrence of GERD. Furthermore, not all risk factors were evaluated, particularly the consideration of body mass index. Second, the data were collected through self-administration, which exposes the study to a risk of reporting bias. Additionally, the selection of students who reported GERD symptoms relied solely on subjective clinical criteria, which may lead to either an overestimation or underestimation of the actual prevalence of GERD. Further-

more, the size of the training units reduces the statistical power of the study. Lastly, as the included students were exclusively from ULBO, the results may not be generalizable to the entire student population of the country.

- **Prevalence**

In our study conducted with 432 students from ULBO in 2025, the prevalence of GERD was 25.5%. The distribution among training units revealed that UFR/SS was the most affected, with 11.1% of cases, followed by IFPM at 8.6% and UFR/ST at 5.8%. This local prevalence can be compared to data from the international literature, where studies conducted in similar contexts exist. For instance, Sharma *et al.* reported a prevalence of 25% among 600 medical students in India in 2018 [20]. Essa *et al.* conducted a survey in Egypt in 2023 with 602 medical students, reporting a slightly higher prevalence of 28.4% [21]. In Burundi, R. Ntagirabiri *et al.* reported a prevalence of 27.8% among 400 students in 2011 [8]. Abdulrahman *et al.* revealed a prevalence of 34.6% in a study involving 1533 students in Saudi Arabia, one of the highest among the reviewed studies [22]. In Nigeria, Nwokediuko *et al.* reported a prevalence of 26.34% of GERD among medical students in 2009 [23]. Belete *et al.* reported a prevalence of 32.1% among 512 university students in the Amhara region of Ethiopia in 2023 [11]. The 25.5% prevalence observed in our study aligns with international data seen in both student populations (25% - 35%) and globally [3]. It is lower than that reported in Ethiopia and significantly lower than that in Saudi Arabia, which may be explained by similar student lifestyles. It is comparable to those observed in India, Nigeria, and Burundi, likely due to differing nutritional and social contexts.

- **Sociodemographic, Behavioral, Clinical Characteristics, and Factors Associated with GERD**

Gender, marital status, and type of cohabitation were not identified as significantly associated with the occurrence of GERD. A slight male predominance (53.6%) among GERD cases was observed, which is similar to the findings of Sharma *et al.*, who noted a more pronounced prevalence among males in a population of medical students in India [20]. In contrast, the Egyptian study by Essa *et al.* reported a dominant female proportion among GERD cases [21]. These differences could be attributed to cultural, behavioral, and methodological factors, including greater male exposure to risk factors in certain regions and a higher propensity among females to report symptoms in other contexts. Nevertheless, other studies suggest a greater susceptibility of women to GERD, possibly linked to hormonal factors or lifestyle differences [24]. The average age of participants was 22.3 years ± 2.76, reflecting an active student population, with a majority being single (93.6%). Regarding the type of cohabitation, most lived alone, a condition that could affect dietary habits and perceived stress, both potentially related to GERD. However, no clear correlation was established in our study. The affiliation with a training unit was a factor associated with GERD ($p = 0.002$). Specifically, students from UFR/SS had a significantly higher risk of developing GERD, with an adjusted OR of 3.54 ($p = 0.015$). This could be attributed to academic stress, workload, and

more disrupted dietary or sleep habits in this field, as reported in a study on the health of medical students by Baklola *et al.* [10].

Lifestyle habits play a crucial role in the pathogenesis of GERD. In our study population, tobacco use was low (6.4%), contrasting with findings from Abdulrahman *et al.*, where tobacco was a triggering factor for GERD [22]. Alcohol consumption was reported by 22.7% of students in our study and was not statistically significant concerning the occurrence of GERD ($p = 0.245$). These results oppose the meta-analysis by Pan *et al.*, which provided evidence of a potential association between alcohol consumption and the risk of developing GERD [25]. The absence of a statistically significant association between alcohol consumption and GERD in our study may be explained by the limited power of the sample. Regular consumption of coffee, tea, or carbonated beverages was very high (80%) and was identified as a major independent risk factor (ORa = 12.79; $p = 0.036$) [1.18 - 139.06]. Our findings align with those of Abdulrahman *et al.*, who identified these consumption habits as behavioral factors triggering GERD [22], likely due to their stimulating effect on gastric acid secretion and their role in loosening the lower esophageal sphincter (LES). The frequent consumption of fatty, spicy, or acidic foods was very high (90.9%). In our study, the regular intake of fatty, spicy, or acidic meals 4 to 6 times per week constituted a significant risk factor (ORa = 18.83; $p = 0.032$) [1.29 - 275.23], which could be due to delayed gastric emptying increasing reflux. A Polish study by Jarosz *et al.* involving adults diagnosed with and without GERD showed that the severity of typical symptoms was significantly higher among consumers of fatty, fried, acidic, or spicy foods ($p < 0.001$) [26]. Two major factors associated with GERD in our study, namely the consumption of tea/coffee and the consumption of fatty spicy foods, have wide confidence intervals, which necessitates a cautious interpretation due to the risk of high uncertainty. A notable aspect was the habit among a majority of students to lie down shortly after a meal (85.5%), often within two to three hours. This behavior showed a statistically significant association with the presence of GERD, particularly at a frequency of 2 to 3 times per week (ORa = 2.92; $p = 0.020$). It has been demonstrated that lying down soon after a meal increases the likelihood of gastroesophageal reflux episodes, likely due to reflux being facilitated in the supine position shortly after eating. Indeed, a study in Japan by Fujiwara *et al.* in 2005 indicated that subjects with less than a 3-hour interval between dinner and bedtime had an increased risk of GERD symptoms [27]. The high level of academic stress observed in more than half of the students with GERD (54.5%) may also contribute to the onset or exacerbation of symptoms [28].

Family histories were more prevalent for digestive disorders (MUGD) at 31.8% and less so for GERD at 10.9%. Personal history of gastroduodenal ulcers (adjusted OR = 0.231; $p = 0.012$) and family history of GERD (adjusted OR = 0.224; $p = 0.031$) were both significantly associated with GERD, suggesting a possible genetic component or individual predisposition. A study by Mohammed *et al.* in 2005 highlighted a significant association between family history of upper gastro-

intestinal disease and an increased risk of developing GERD [29]. These data underscore the importance of genetic factors in the pathophysiology of GERD.

5. Conclusions

Our study, conducted among 432 students at Lédéa Bernard Ouédraogo University, revealed a notable prevalence of GERD, estimated at 25.5%. This finding sheds light on a health issue that has been relatively unexplored in this context. Several factors were identified as significantly associated with the occurrence of GERD, including specific dietary habits, postprandial behaviors, and personal or family medical histories. These results emphasize the need for targeted preventive actions in university settings, particularly concerning nutritional education and lifestyle hygiene.

Multicenter, longitudinal, and larger-scale studies are necessary to better understand the determinants of GERD in student populations and to guide public health policies in academic environments. Additionally, several research avenues should be further explored to enhance the understanding of GERD in university settings. An analysis of students' knowledge, attitudes, and practices regarding GERD could help tailor prevention messages more effectively. Furthermore, studying the impact of GERD on academic performance, which is still under-documented, could highlight its repercussions on students' academic journeys. Multicenter, longitudinal, and larger-scale studies are needed to refine our understanding of the determinants of GERD among students and to more accurately guide public health policies in academia.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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