



Examining the Impact of Stress Induced Eating on Gastroesophageal Reflux Disease (GERD)

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ABSTRACT

Gastroesophageal reflux disease (GERD) is increasingly recognized among university students, particularly in association with psychological stress and unhealthy dietary behaviors. This cross-sectional study was conducted among 190 university students in Mardan to assess the relationship between stress, stress-induced eating behaviors, and GERD symptoms. The sample comprised 57.9% females and 42.1% males, with the majority (66.8%) aged 21–24 years and 84.2% undergraduates. Stress frequency assessment revealed that 36.8% of participants sometimes experienced stress, while 38.4% reported frequent heartburn and 40.6% reported occasional bloating after stress-induced eating. Skipping meals (42.6%) was the most common stress-related eating behavior, followed by increased intake of caffeine (37.4%) and spicy foods (31.1%). Nearly half of the participants (48.9%) reported daily consumption of paratha, and 31.6% frequently consumed carbonated beverages. A considerable proportion reported that stress-induced eating significantly (15.8%) or somewhat (37.9%) worsened their GERD symptoms. The findings demonstrate a notable association between psychological stress, unhealthy dietary practices, and GERD symptom occurrence among university students. Targeted interventions focusing on stress management and dietary modification may help reduce GERD-related burden in this population.

INTRODUCTION

Stress is the body's natural response to internal or external changes. When exposed to stressors, the body releases hormones such as adrenaline that prepare an individual to respond quickly (Sharma and Pal, 2021). Although stress can be motivating in short-term situations, prolonged exposure leads to physical, mental, and emotional strain (Назимок and Мартинов, 2025). Epidemiological evidence indicates that repeated stressful experiences and chronically elevated stress levels are associated with poorer physical and mental health outcomes and increased mortality (Gradus, 2017).

Stress influences health through both indirect and direct mechanisms. Indirectly, it alters health-related behaviors such as eating patterns, sleep, and physical activity (KivimäkiBartolomucci and Kawachi, 2023). Directly, it activates autonomic and neuroendocrine responses as part of the body's "stress system," which works to restore homeostasis through physiological and behavioral

adaptations (O'ConnorThayer and Vedhara, 2021, Zisopoulou and Varvogli, 2023).

Over the past two decades, increasing attention has been given to the relationship between stress and eating behavior. Research shows that approximately 35-40% of individuals increase their food intake during stress, while others reduce intake or show no change (Hill et al., 2022). Stress-induced eating refers specifically to overeating in response to negative emotions such as stress and anxiety, rather than positive emotional states (Dakanalis et al., 2023). According to Psychosomatic Theory, such eating behaviors may temporarily distract individuals from negative emotional experiences (Geliebter and Aversa, 2003).

Chronic stress is associated with a greater preference for energy-dense foods high in sugar and fat (Torres and Nowson, 2007). Stress-induced eating commonly involves increased consumption of fast foods, salty snacks, sweet and fatty foods, cakes, biscuits, chocolate, ice cream, and

sugar-sweetened beverages (Rahim and Hamirudin, 2022). Among university students, high stress levels are linked with reduced fruit and vegetable intake, increased fast-food consumption, and emotional eating behaviors. Qualitative findings further suggest that female college students perceive stress as a major contributor to emotional eating (BennettGreene and Schwartz-Barcott, 2013). Such dietary patterns may result in excess energy intake, weight gain, and elevated risk of chronic conditions (Betancourt-Núñez et al., 2022).

One important health consequence potentially aggravated by stress-related dietary behaviors is Gastroesophageal Reflux Disease (GERD). GERD is a chronic upper gastrointestinal disorder characterized by the backward flow of stomach contents into the esophagus, leading to symptoms such as heartburn, regurgitation, chest pain, bloating, and swallowing difficulties (Sadeghi et al., 2024). It significantly impairs quality of life and represents a substantial public health burden. Approximately 20% of adults in Western societies are affected (Chhabra and Ingole, 2022), while global prevalence is estimated at 13.98%, ranging from 4.16% in China to 22.40% in Turkey (Sadafi et al., 2024). In Pakistan, reported prevalence ranges between 10% and 64% (Rasool et al., 2021).

GERD is influenced by multiple risk factors, including obesity, family history, smoking, and dietary habits (Wickramasinghe et al., 2023). High-fat meals can increase acid exposure time and reduce lower esophageal sphincter pressure, thereby aggravating reflux symptoms. Common dietary triggers include caffeine, chocolate, spicy foods, fatty meals, citrus fruits, carbonated beverages, mint, onions, and tomato-based products (ÖzenoğluAnul and Özçelikçi, 2023). Lifestyle behaviors prevalent among university students such as late-night eating, meal skipping, and frequent fast-food consumption may further intensify symptoms (Ahmed et al., 2024).

Psychological stress has also been validated as a significant risk factor for GERD (Wickramasinghe et al., 2023). Elevated stress levels may increase gastric acid secretion and promote maladaptive coping behaviors such as smoking, alcohol intake, comfort eating, physical inactivity, and poor sleep, all of which exacerbate reflux symptoms (Turab et al., 2025). Additionally, binge eating behaviors have been associated with gastrointestinal symptoms including heartburn and regurgitation (Hossain et al., 2025).

Several studies have explored associations among stress, dietary habits, and GERD in student populations. (Puspitasari et al., 2024) reported a significant relationship between psychological stress, fatty food consumption, and GERD occurrence among medical students. (Ahmed et al., 2024) found that 22.6% of Egyptian university students had GERD, with 86.3% reporting high stress levels. Abed et al., observed a 33.4% prevalence of GERD symptoms and a 10.3% prevalence of Night Eating Syndrome among Palestinian undergraduates (Abed et al., 2024). Caffeine intake, fast-paced eating, and lying down after meals as risk factors among Chinese school students, Similarly, Essa, Nasser et al. documented a 28.4% prevalence among Egyptian medical students, with anxiety and stress as significant contributors (Essa et al., 2024).

Regional evidence further highlights dietary influences. Farooq & Hassan reported that 35% of participants had undiagnosed GERD and 65% were diagnosed, with spicy, processed, and caffeinated foods strongly linked to symptom severity in Pakistan (Farooq and Hassan, 2025). (Hossain et al., 2025) documented a 45.5% prevalence among Bangladeshi university students. Additional studies have demonstrated associations between GERD and sleep quality (Hsieh et al., 2025), coffee consumption and smoking and processed food intake (SiregarHulu and Lase, 2025).

Despite substantial evidence linking stress to altered eating behaviors and identifying dietary triggers for GERD, there remains limited comprehensive research examining the combined effect of stress-induced eating behaviors on GERD development, severity, and frequency. Most studies investigate stress and diet independently rather than exploring how stress-driven dietary changes may mediate GERD symptomatology. This gap is particularly relevant among university students, who experience high psychological stress and frequently adopt irregular eating patterns.

Therefore, the present study aims to investigate the relationship between stress-induced eating and the severity and frequency of GERD among graduates and undergraduates of Mardan. Objective of study are to evaluate the impact of psychological stress on eating behaviors and analyze dietary choices made during stress periods and identify commonly consumed trigger foods and food groups and their effects on GERD symptoms.

MATERIALS AND METHODS

Study Design

This study employed a quantitative, cross-sectional descriptive research design to examine the relationship between stress-induced eating and Gastroesophageal Reflux Disease (GERD). A cross-sectional approach was considered appropriate as it allows for the simultaneous assessment of exposure variables (psychological stress and stress-induced eating behaviors) and outcome variables (GERD symptoms) within a defined population. Statistical analysis was applied to determine associations between the study variables.

Study Population and Sampling

The study population consisted of graduates and undergraduates residing in Mardan. Participants were mainly aged between 21–24 years. This population was selected to evaluate dietary patterns, psychological stress levels, and nutritional status in relation to GERD symptoms among young adults, who are particularly vulnerable to academic stress and irregular eating behaviors. A total sample of 190 students was included in the study. Participants were recruited using a convenience sampling technique, whereby individuals who were easily accessible and willing to participate were selected. This method was chosen due to feasibility and accessibility within the study setting.

Data Collection Instruments

Data were collected using a structured, self-administered questionnaire consisting of multiple sections designed to assess socio-demographic characteristics, stress levels,

eating behaviors, dietary intake, nutritional status, and GERD symptoms. Sociodemographic related questions about age, gender, educational level (graduate/undergraduate), and other relevant background information was asked. Psychological stress levels were assessed using a structured stress-related questionnaire. Items evaluated perceived stress and its influence on eating behaviors, including emotional eating, overeating, undereating, meal skipping, and late-night eating patterns. Dietary patterns were assessed using a Food Frequency Questionnaire (FFQ). The FFQ evaluated the frequency of consumption of specific food groups, particularly foods commonly associated with stress-induced eating and GERD triggers such as high-fat foods, spicy foods, caffeinated beverages, carbonated drinks, citrus fruits, and fast foods. Nutritional status was assessed through a detailed questionnaire addressing anthropometric measurements like BMI, meal patterns, portion sizes, and general dietary habits. Relevant indicators related to nutritional behavior were recorded to evaluate their association with GERD symptoms. GERD symptoms were assessed using the reflux disease questionnaire (RDQ) to assess typical GERD symptoms. Participants reported the frequency and severity of symptoms such as heartburn, regurgitation, chest discomfort, bloating, and difficulty swallowing were monitored and the common RDQ screening GERD cut-off of 12 points was adopted (Yuan et al., 2019).

Data Collection and Statistical Analysis

Primary data were collected directly from undergraduate and graduate students. Participants were informed about the purpose of the study, and informed consent was obtained prior to data collection. The questionnaire was distributed and completed by respondents to gather information regarding psychological stress, stress-induced eating behaviors, dietary patterns, nutritional status, and GERD symptoms.

The collected data were compiled and analyzed statistically to determine the association between stress-induced eating and the frequency and severity of Gastroesophageal Reflux Disease (GERD).

RESULTS AND DISCUSSIONS

In the present study, students from universities in Mardan were analyzed. The sample comprised of 110 (57.9%) females and 80 (42.1%) males. Regarding age distribution, 22.7% of participants were aged 17–20 years, 66.8% were 21–24 years, 6.9% were 25–28 years, and 0.5% were 29–32 years. In terms of educational status, 160 participants (84.2%) were undergraduates and 30 (15.8%) were graduates.

Similarly, Turab and Awan conducted a cross-sectional study to determine the prevalence of gastroesophageal reflux disease (GERD) and its association with stress among 439 healthcare students. Of these, 59.7% (262) were female and 40.3% (177) were male, with a mean age of 20.5 years. The majority 72.7%, (319) were day scholars. GERD symptoms were more prevalent among females 16.4%, (43) compared to males 9.6%, (17). Females also demonstrated significantly higher stress levels. Although study program, age, accommodation

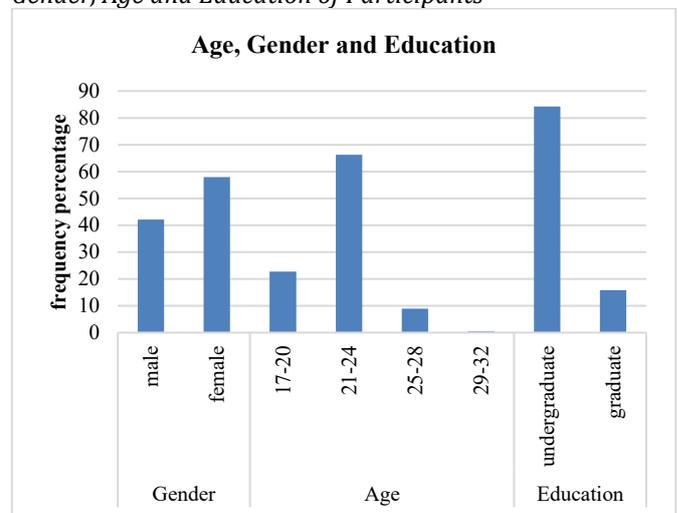
status, and study/sleep duration were not directly associated with GERD, elevated stress levels were linked to longer study hours (5.77 hours) and sleep duration (7.93 hours) (Turab et al., 2025).

Furthermore, Hossain et al. (2025) conducted a cross-sectional study assessing susceptibility to GERD among Bangladeshi students. The study included 402 participants, of whom 57.2% (230) were female and 42.8% (172) were male. The prevalence of GERD symptoms was 45.5% (183), as indicated by the Frequency Scale for the Symptoms of GERD (FSSG) score greater than 8. The majority of participants (79.5%) were aged 22–24 years.

As illustrated in Figure 1, a higher number of female participants (77) reported GERD symptoms compared to male participants (66). Most participants who experienced GERD symptoms belonged to the 21–24 years age group (96), while 31 individuals in this age group reported no symptoms. In the 17–20 years age group, (34) participants reported experiencing GERD symptoms. These findings indicate a notable distribution of GERD symptoms across gender and age categories within the study population.

Figure 1

Gender, Age and Education of Participants



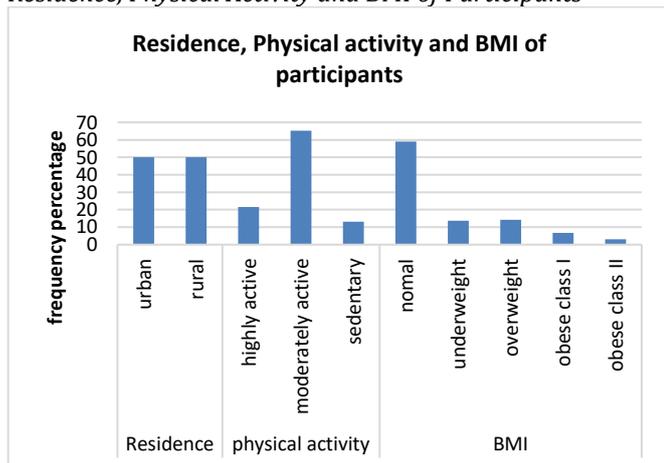
Out of the total 190 participants, 50 (26.3%) resided in rural areas, whereas 140 (73.7%) lived in urban settings. Regarding physical activity levels, 41 participants (21.6%) were classified as highly active, 25 (13.2%) as sedentary, and 124 (65.3%) as moderately active. In terms of body mass index (BMI), 112 participants (59%) were within the normal range, 26 (13.6%) were underweight, 27 (14.2%) were overweight, 13 (6.8%) were categorized as obese class I, and 6 (3.1%) as obese class II. Additionally, stress levels were assessed, and the majority of participants were most likely to report elevated stress levels (Figure 2). These findings are discussed in light of previous literature. Dziekiewicz et al. conducted a study on 104 obese patients (mean age 40.34 years) and reported that three months following sleeve gastrectomy, both body weight and BMI significantly decreased ($p < 0.001$), accompanied by a significant reduction in reflux symptoms ($p < 0.05$). Complete symptom resolution was observed in 13.4% of patients, whereas 31.8% of previously asymptomatic individuals developed gastroesophageal reflux disease

(GERD) (Dziekiewicz et al., 2023). Similarly, Djärv et al. examined 4,910 participants (70.5% response rate from 6,969 individuals) to assess the association between physical activity, GERD, and obesity. High physical activity was reported by 50% of participants, GERD prevalence was 10%, and obesity prevalence was 14%. Obese individuals were slightly older, had more comorbidities, and reported higher frequencies of GERD and sleep-related problems. While crude analysis suggested a reduced GERD risk among normal-weight individuals with high physical activity, adjusted analyses demonstrated no statistically significant association in normal-weight or overweight groups. However, among obese participants, intermediate physical activity was significantly associated with a reduced risk of GERD (adjusted OR: 0.41; 95% CI: 0.22–0.77 (Djärv et al., 2012).

Furthermore, Wickramasinghe et al. investigated stress-induced eating and GERD symptoms among 1,200 participants. Stress levels were stratified as low, moderate, and high, with corresponding mean GERD scores of 13.47 (SD 11.87), 18.20 (SD 17.27), and 28.33 (SD 32.59), respectively. The prevalence of GERD in Sri Lanka was reported as 25.3%, with 42.1% males and 57.9% females affected (Wickramasinghe et al., 2023). In addition, Ahmed et al. examined the association between stress, anxiety, physical activity, dietary habits, and GERD symptoms. Their findings indicated that individuals who reported less frequent consumption of fried and fatty foods and greater intake of fruits and vegetables had lower odds of experiencing GERD symptoms (Ahmed et al., 2024).

Seventy-four respondents with normal BMI reported GERD symptoms, representing the highest frequency among BMI categories. This was followed by 30 respondents in the overweight category. Among participants classified as obese class II, 2 respondents reported No to GERD symptoms. With respect to physical activity levels, GERD symptoms were most commonly reported among moderately active participants, with 92 responding yes and 32 responding No. Among highly active individuals, 29 reported experiencing GERD symptoms, while 12 reported no symptoms. These findings suggest a complex interaction between BMI, physical activity, stress, and GERD symptoms within the study population as illustrated in Figure 2.

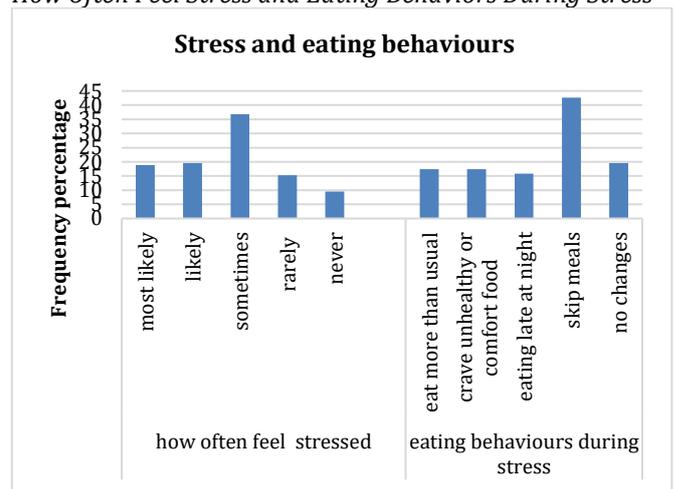
Figure 2
Residence, Physical Activity and BMI of Participants



Among the 190 participants, the frequency of perceived stress was assessed. A total of 36 participants (18.9%) reported feeling stressed most likely, 37 (19.5%) likely, 70 (36.8%) sometimes, 29 (15.3%) rarely, and 18 (9.5%) never. Eating behaviors during periods of stress were also evaluated. The findings indicated that 33 participants (17.4%) reported eating more than usual, 33 (17.4%) experienced cravings for unhealthy or comfort foods, 30 (15.8%) reported eating late at night, 81 (42.6%) reported skipping meals, and 37 (19.5%) reported no changes in their eating behavior (Figure 3).

These findings are consistent with the study by Suriyayothin et al. which explored the association between exam-related stress and GERD symptoms. The study demonstrated that acute stress can exacerbate GERD symptoms by increasing the perception of esophageal responses to acid stimulation, while prolonged stress may contribute to a higher prevalence of GERD symptoms. The authors concluded that stress and anxiety are positively correlated with GERD. As illustrated in Figure 3, 22 respondents reported no changes in their eating behaviors during stressful periods, whereas 54 reported skipping meals. Additionally, 23 participants reported eating more than usual, and 22 reported selecting comfort food when experiencing stress. These results indicate that stress is associated with notable alterations in dietary behaviors, particularly meal skipping and increased consumption patterns (Suriyayothin Angkatavanich and Barrameesangpet, 2023).

Figure 3
How Often Feel Stress and Eating Behaviors During Stress

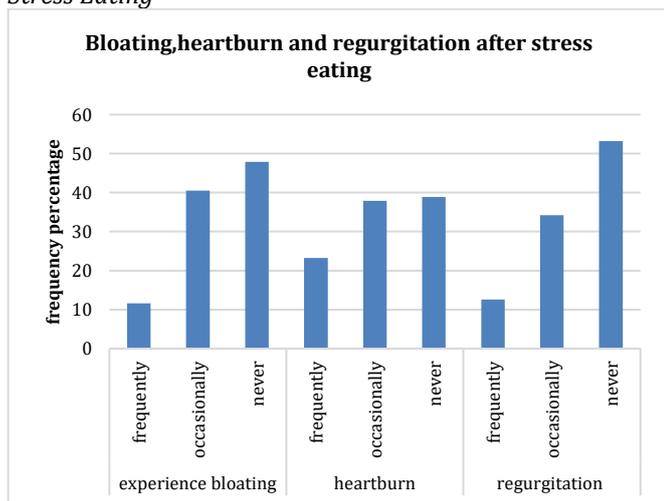


Among the 190 participants, the frequency of experiencing bloating, heartburn, and regurgitation after stress-induced eating was assessed (Figure 4). For bloating, 22 participants (11.6%) reported experiencing symptoms frequently, 77 (40.6%) occasionally, and 91 (47.9%) never. Regarding heartburn, 44 participants (23.2%) reported frequent symptoms, 72 (37.9%) occasional symptoms, and 74 (38.4%) never experiencing heartburn. For regurgitation, 24 participants (12.6%) reported frequent symptoms, 65 (34.2%) occasional symptoms, and 101 (53.2%) reported never experiencing regurgitation. These findings are consistent with previous literature by Puspitasari et al. conducted a cross-sectional study among 102 medical students to assess GERD in relation to stress

and dietary habits using the GERD-Q, Food Frequency Questionnaire, and Perceived Stress Score (PSS) scale. Significant associations were identified between GERD and stress, irregular eating patterns, spicy food intake, and oily food consumption. Oily and fatty food intake was identified as the strongest contributing factor, doubling the risk of GERD among students (Puspitasari et al., 2024). Similarly, Siregar et al., analyzed factors associated with GERD occurrence among students using Chi-square analysis. Their results demonstrated that eating habits, coffee consumption, stress level, and body mass index had significant effects on the occurrence of GERD symptoms. The study further revealed that 33.4% of undergraduate students were at risk of GERD, with night eaters exhibiting a greater risk (SiregarHulu and Lase, 2025).

As shown in Figure 4, bloating was most commonly reported among participants who experienced symptoms occasionally (67) responding “yes,” followed by those who reported never experiencing bloating (59). For heartburn, 45 participants reported never experiencing symptoms, 58 reported occasional symptoms, and 40 reported frequent symptoms; the corresponding “no” responses were 29, 14, and 4, respectively. Regarding regurgitation, 68 participants were in the “never” category, while 52 reported occasional symptoms. These findings indicate that GERD-related symptoms were present even among respondents who otherwise reported low or no perceived symptom frequency, suggesting variability in symptom perception and reporting within the study population.

Figure 4
Experiencing Bloating, Heartburn and Regurgitation After Stress Eating



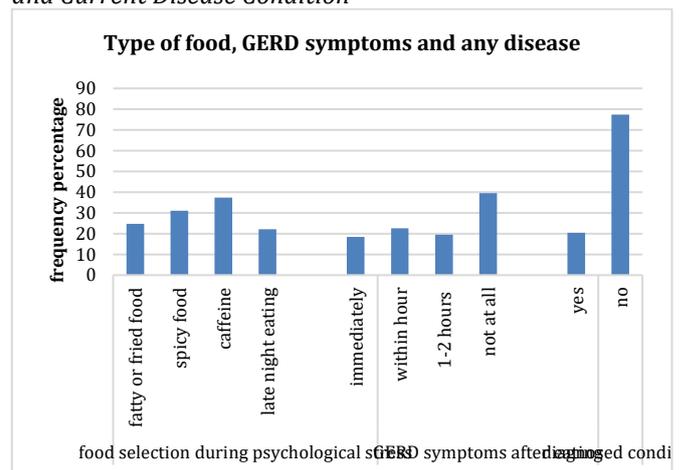
Among the 190 participants, food and lifestyle choices during periods of psychological stress were assessed (Figure 5). Caffeine was the most frequently selected item (37.4%), followed by spicy food (31.1%), fatty or fried food (24.1%), and late-night eating (22.1%). Regarding the onset of GERD symptoms after eating, the largest proportion of participants (39.5%) reported not experiencing any symptoms. However, 18.4% reported symptom occurrence immediately after eating, 22.6% within one hour, and 19.5% between one and two hours post-meal.

With respect to medical history, the majority of participants (77.4%) reported not having a diagnosed

medical condition, whereas 20.5% indicated that they had received a medical diagnosis. These findings are consistent with previous literature. Zhang and co conducted a comprehensive review examining dietary and lifestyle factors associated with gastroesophageal reflux disease (GERD), including 72 articles with a total sample size of 34,762 participants (20,778 males and 13,984 females). The findings demonstrated that diets rich in fats and protein, as well as tea consumption, were positively correlated with GERD, whereas vegetable-based diets were negatively correlated. The authors concluded that poor dietary choices, midnight snacking, stress-induced eating, overeating, and the consumption of spicy and high-calorie foods are positively associated with GERD (Zhang et al., 2021).

Similarly, Farooq and Hassan reported in a study of 76 participants that 65% had diagnosed GERD, while 35% experienced symptoms without formal diagnosis. Spicy food (50%), fried food (45%), and caffeine intake (65%) were strongly associated with symptom severity ($p < 0.001$). Overall, 70% of participants reported moderate to severe symptoms affecting sleep and daily activities, and 40% expressed dissatisfaction with their treatment plan (Farooq and Hassan, 2025). Collectively, the present findings align with prior evidence indicating that stress-related dietary behaviors particularly caffeine intake, spicy and fatty food consumption, and late-night eating are important contributors to the occurrence and severity of GERD symptoms.

Figure 5
Food Selection During Psychological Stress, GERD Symptoms and Current Disease Condition

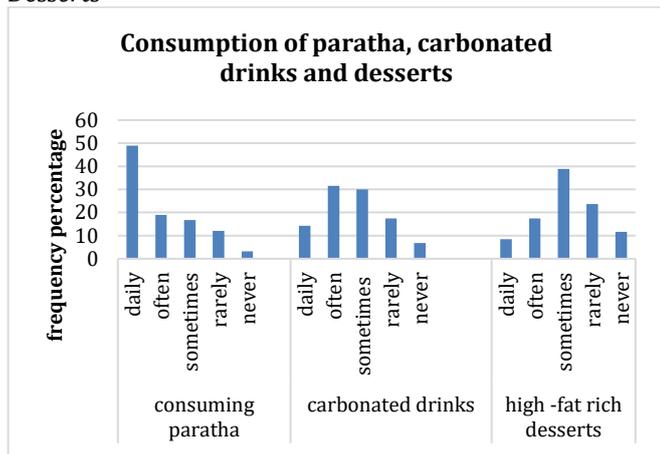


Among the 190 participants, paratha emerged as the most commonly consumed food item, with 48.9% reporting daily intake (Figure 4.6). Carbonated drinks were frequently consumed by 31.6% of participants, while 30% reported consuming them sometimes. High fat-rich desserts were most commonly consumed sometimes (38.9%), and this category demonstrated the lowest daily consumption rate (8.4%) among the listed food items. A small proportion of participants reported never consuming paratha (3.2%), carbonated drinks (6.8%), or high fat-rich desserts (11.6%). These findings are supported by existing literature. Bereda, in a literature review examined the effects of coffee on gastric acid secretion, reflux, and mucosal irritation. The review

concluded that although coffee appears to influence gastric physiology and reflux symptoms, a definitive causal relationship remains unproven without further clinical trials (Bereda, 2025).

Eighty-four respondents experiencing GERD symptoms reported excessive caffeine intake, while 23 reported experiencing symptoms sometimes. Sixteen participants responded (no) when asked about caffeine consumption. Regarding carbonated drinks, 33 respondents reported daily consumption, 20 reported often consuming them, and 7 responded (no). These findings suggest a notable pattern between caffeine and carbonated beverage consumption and the reporting of GERD symptoms within the study population as illustrated in Figure 6.

Figure 6
Consumption of Paratha, Carbonated Drinks and Fat-Rich Desserts



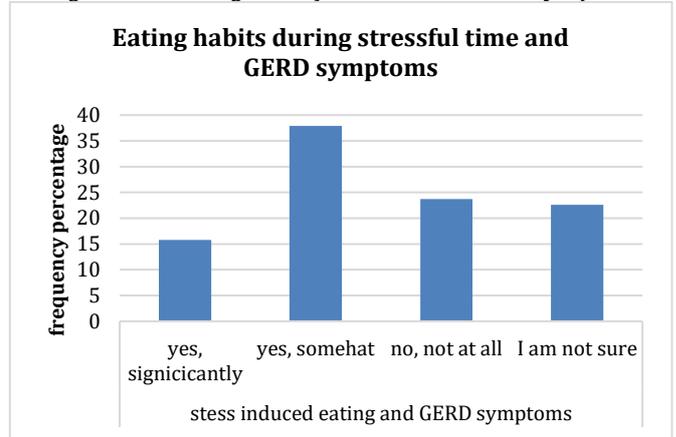
Among the 190 participants, 15.8% reported that their eating habits during stressful periods significantly worsened their GERD symptoms, while 37.9% indicated that stress-induced eating somewhat worsened their symptoms (Figure 7). In contrast, 23.7% reported no worsening of GERD symptoms due to stress-related eating behaviors, and 22.6% were unsure about the presence of such a relationship.

These findings are consistent with the study conducted by Puspitasari et al. which examined the relationship between stress, eating habits, and the occurrence of GERD among 102 medical students from the 2020-2022 session using the GERD-Q and a meal pattern questionnaire. The study identified overconsumption of oily and fatty foods particularly during stressful periods as the most prominent independent variable associated with GERD symptoms, reporting that it triggered GERD symptoms two times more frequently (Puspitasari et al., 2024).

In the present study, 27 participants reported that stressful eating significantly affected their GERD symptoms, while 64 indicated a somewhat effect. Additionally, 26 participants were unsure about the association, suggesting that some individuals may not

clearly perceive the link between stress-induced eating behaviors and GERD symptom exacerbation. These results underscore the perceived influence of stress-related dietary patterns on GERD symptom severity within the study population.

Figure 7
Eating Habits During Stressful Time and GERD Symptoms



CONCLUSION AND RECOMMENDATION

The present study highlights a substantial prevalence of stress and GERD-related symptoms among university students in Mardan. Female students constituted a slightly higher proportion of the sample, and the majority of participants were aged 21–24 years. A significant number of students reported experiencing stress at varying frequencies, with many adopting maladaptive eating behaviors during stressful periods, particularly meal skipping, caffeine consumption, spicy food intake, fatty food consumption, and late-night eating.

GERD symptoms such as bloating, heartburn, and regurgitation were reported frequently or occasionally by a considerable proportion of participants. Importantly, more than half of the respondents acknowledged that stress-induced eating either significantly or somewhat worsened their GERD symptoms. The data further indicate that commonly consumed foods, including paratha, carbonated drinks, caffeine, and high-fat desserts, may contribute to symptom exacerbation. Overall, the findings suggest a clear relationship between psychological stress, unhealthy dietary behaviors, and the occurrence or aggravation of GERD symptoms among university students. Stress-related dietary modifications appear to play a critical role in symptom development and severity. Awareness campaigns such as seminars on healthy eating choices and habits should be conducted to educate people on the impact of stress induced eating on gastrointestinal health. University campuses and cafeterias should offer healthier food choices and limit the food items availability which are known to trigger GERD symptoms. Regular medical screenings should also be encouraged to detect early signs of GI issues and provide timely care.

REFERENCES

1. Abed, M. T., Sayyed, E., Yamak, O., Abdoh, Q. & Badrasawi, M. 2024. The association between night eating syndrome and GERD symptoms among university students at An-Najah National University in Palestine: a cross-sectional study. BMC gastroenterology, 24, 169. <https://doi.org/10.1186/s12876-024-03259-y>
2. Ahmed, H. A. A., Yousef, A., El-Kurdy, R., Murad, M. A., Abdelwahab, S. M. & Shiba, H. A. A. 2024. Psychological

- factors, lifestyle habits, and their association with gastroesophageal reflux disease among Egyptian university students: A cross-sectional study. *Medicine*, 103, e40477. <https://doi.org/10.1097/md.00000000000040477>
3. Bennett, J., Greene, G. & Schwartz-Barcott, D. 2013. Perceptions of emotional eating behavior. A qualitative study of college students. *Appetite*, 60, 187-192. <https://doi.org/10.1016/j.appet.2012.09.023>
 4. Bereda, G. 2025. Deciphering the Impact of Coffee on the Upper Gastrointestinal Tract: Correlation or Causation? <https://doi.org/10.20944/preprints202503.2253.v1>
 5. Betancourt-Núñez, A., Torres-Castillo, N., Martínez-López, E., De Loera-Rodríguez, C. O., Durán-Barajas, E., Márquez-Sandoval, F., Bernal-Orozco, M. F., Garaulet, M. & Vizmanos, B. 2022. Emotional eating and dietary patterns: reflecting food choices in people with and without abdominal obesity. *Nutrients*, 14, 1371. <https://doi.org/10.3390/nu14071371>
 6. Chhabra, P. & Ingole, N. 2022. Gastroesophageal reflux disease (GERD): highlighting diagnosis, treatment, and lifestyle changes. *Cureus*, 14. <https://doi.org/10.7759/cureus.28563>
 7. Dakanalís, A., Mentzelou, M., Papadopoulou, S. K., Papandreou, D., Spanoudaki, M., Vasios, G. K., Pavlidou, E., Mantzorou, M. & Giaginis, C. 2023. The association of emotional eating with overweight/obesity, depression, anxiety/stress, and dietary patterns: a review of the current clinical evidence. *Nutrients*, 15, 1173. <https://doi.org/10.3390/nu15051173>
 8. Djärvi, T., Wikman, A., Nordenstedt, H., Johar, A., Lagergren, J. & Lagergren, P. 2012. Physical activity, obesity and gastroesophageal reflux disease in the general population. *World journal of gastroenterology: WJG*, 18, 3710. <https://doi.org/10.3748/wjg.v18.i28.3710>
 9. Dziekiewicz, A., Bystron, J., Kobiałka, J. & Ludwig, B. 2023. Endovascular procedures and nursing care: managing vascular access wounds. *Pielęgniarstwo Chirurgiczne i Angiologiczne/Surgical and Vascular Nursing*, 17, 119-124. <https://doi.org/10.5114/pchia.2023.131999>
 10. Essa, A., Nasser, A., Nourelddeen, I. M., Ebeid, I., Ebeid, A., Ahmed, B., Allam, H. K., Shehab-Eldeen, S. & Essa, A. 2024. Gastroesophageal reflux disease among undergraduate medical students in Egypt: Prevalence and risk factors. *International Journal of General Medicine*, 6037-6046. <https://doi.org/10.2147/ijgm.s503049>
 11. Farooq, Q. & Hassan, S. 2025. Relationship Between Dietary Patterns and Symptom Severity in Gastroesophageal Reflux Disease (GERD): A Patient-Centered Survey. *Journal of Health and Rehabilitation Research*, 1-9. <https://doi.org/10.61919/jhrr.v5i1.1753>
 12. Geliebter, A. & Aversa, A. 2003. Emotional eating in overweight, normal weight, and underweight individuals. *Eating behaviors*, 3, 341-347. [https://doi.org/10.1016/s1471-0153\(02\)00100-9](https://doi.org/10.1016/s1471-0153(02)00100-9)
 13. Gradus, J. L. 2017. Prevalence and prognosis of stress disorders: a review of the epidemiologic literature. *Clinical epidemiology*, 251-260. <https://doi.org/10.2147/clep.s106250>
 14. Hill, D., Conner, M., Clancy, F., Moss, R., Wilding, S., Bristow, M. & O'connor, D. B. 2022. Stress and eating behaviours in healthy adults: a systematic review and meta-analysis. *Health Psychology Review*, 16, 280-304. <https://doi.org/10.1080/17437199.2021.1923406>
 15. Hossain, T., Mahmood, I. F., Hossain, M. S., Tabassum, N., Shipa, S. J. & Sarkar, M. R. 2025. Evaluation of the Susceptibility of Bangladeshi University Students to Gastroesophageal Reflux Disease (GERD) and Its Associated Factors: A Cross-Sectional Study. *Health Science Reports*, 8, e70646. <https://doi.org/10.1002/hsr.2.70646>
 16. Hsieh, M.-T., Kuo, H.-Y., Lin, S.-H., Chang, W.-L. & Lin, C.-Y. 2025. Associations Between Sleep Quality, Anxiety, Depression, and Gastroesophageal Reflux Disease in a Tertiary Hospital Sleep Center: A Retrospective Study. *International Journal of General Medicine*, 6533-6542. <https://doi.org/10.2147/ijgm.s554279>
 17. Kivimäki, M., Bartolomucci, A. & Kawachi, I. 2023. The multiple roles of life stress in metabolic disorders. *Nature Reviews Endocrinology*, 19, 10-27. <https://doi.org/10.1038/s41574-022-00746-8>
 18. O'Connor, D. B., Thayer, J. F. & Vedhara, K. 2021. Stress and health: A review of psychobiological processes. *Annual review of psychology*, 72, 663-688. <https://doi.org/10.1146/annurev-psych-062520-122331>
 19. Özenoğlu, A., Anul, N. & Özçelikçi, B. 2023. The relationship of gastroesophageal reflux with nutritional habits and mental disorders. *Human Nutrition & Metabolism*, 33, 200203. <https://doi.org/10.1016/j.hnm.2023.200203>
 20. Puspitasari, A., Sukmagautama, C., Sari, A. A. A. & Hermawati, B. D. 2024. The Relationship Between Stress and Eating Habits and the Occurrence of GERD in Medical Students. *Smart Medical Journal*, 7, 73-81.
 21. Rahim, A. S. A. & Hamirudin, A. H. 2022. Types of snack intake associated with stress among adults: A scoping review. *International Journal of Allied Health Sciences*, 6, 2780-2801.
 22. Rasool, M. F., Sarwar, R., Arshad, M. S., Imran, I., Saeed, H., Majeed, A., Akbar, M., Chaudhry, M. O., Rehman, A. U. & Ashraf, W. 2021. Assessing the frequency and risk factors associated with gastroesophageal reflux disease (GERD) in Southern Punjab, Pakistan. *Risk Management and Healthcare Policy*, 4619-4625. <https://doi.org/10.2147/rmh.p.s335142>
 23. Sadafi, S., Azizi, A., Pasdar, Y., Shakiba, E. & Darbandi, M. 2024. Risk factors for gastroesophageal reflux disease: a population-based study. *BMC gastroenterology*, 24, 64. <https://doi.org/10.1186/s12876-024-03143-9>
 24. Sadeghi, A., Boustani, P., Mehrpour, A., Asgari, A. A., Sharafkhan, M., Yazdanbod, A., Somi, M. H., Nejatizadeh, A., Moradpour, F. & Rezaeian, M. 2024. Prevalence and risk factors of gastroesophageal reflux disease in Iran: A cross-sectional analysis from the PERSIAN cohort. *Plos one*, 19, e0306223. <https://doi.org/10.1371/journal.pone.0306223>
 25. Sharma, S. K. & Pal, M. 2021. Stress and human body. *International Journal of Physical Education Sports Management and Yogic Sciences*, 11, 57-70. <https://doi.org/10.5958/2278-795x.2021.00037.0>
 26. Siregar, S. D., Hulu, V. T. & Lase, D. V. 2025. Factors Associated with the Occurrence of Gastroesophageal Reflux Disease (Gerd) In Students. *Periodic Epidemiology Journal/Jurnal Berkala Epidemiologi*, 13. <https://doi.org/10.20473/jbe.v13i12025.58-65>
 27. Suriyayothin, M., Angkatavanich, W. & Barrameesangpet, S. 2023. The Impact of Exam Related Stress on Gastroesophageal Reflux Disease (GERD) Symptoms among High School Students in Bangkok. *International Journal of Current Science Research and Review*, 06 <https://doi.org/10.47191/ijcsrr/v6-i8-46>
 28. Torres, S. J. & Nowson, C. A. 2007. Relationship between stress, eating behavior, and obesity. *Nutrition*, 23, 887-894. <https://doi.org/10.1016/j.nut.2007.08.008>
 29. Turab, M. S., Awan, M. A., Masroor, L., Amir, K., Khan, M. & Liaquat, A. 2025. Stress and gastroesophageal reflux disease: are they related? *Cureus*, 17. <https://doi.org/10.7759/cureus.79037>

30. Wickramasinghe, N., Thuraisingham, A., Jayalath, A., Wickramasinghe, D., Samarasekara, N., Yazaki, E. & Devanarayana, N. M. 2023. The association between symptoms of gastroesophageal reflux disease and perceived stress: A countrywide study of Sri Lanka. PLoS One, 18, e0294135. <https://doi.org/10.1371/journal.pone.0294135>
31. Yuan, L.-Z., Yi, P., Wang, G.-S., Tan, S.-Y., Huang, G.-M., Qi, L.-Z., Jia, Y. & Wang, F. 2019. Lifestyle intervention for gastroesophageal reflux disease: a national multicenter survey of lifestyle factor effects on gastroesophageal reflux disease in China. Therapeutic advances in gastroenterology, 12, 1756284819877788. <https://doi.org/10.1177/1756284819877788>
32. Zhang, M., Hou, Z.-K., Huang, Z.-B., Chen, X.-L. & Liu, F.-B. 2021. Dietary and lifestyle factors related to gastroesophageal reflux disease: a systematic review. Therapeutics and clinical risk management, 305-323. <https://doi.org/10.2147/tcrm.s296680>
33. Zisopoulou, T. & Varvogli, L. 2023. Stress management methods in children and adolescents: past, present, and future. Hormone Research in Paediatrics, 96, 97-107. <https://doi.org/10.1159/000526946>
34. Назимок, В. & Мартинов, Ю. 2025. The body's reactions to stress, its characteristics and manifestations. Науковий часопис Українського державного університету імені Михайла Драгоманова. Серія 15, 235-238.