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The Impact of Exam Related Stress on Gastroesophageal Reflux Disease (GERD) Symptoms among High School Students in Bangkok

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ABSTRACT: Gastroesophageal reflux disease (GERD) is a digestive condition where the stomach's acidic contents consistently flow back up into the esophagus which serves as the conduit linking the throat to the stomach. In most cases, individuals with GERD experience symptoms such as heartburn and regurgitation due to the weakening or improper relaxation of the lower esophageal sphincter. Stress, on the other hand, is an instinctive response that stimulates individuals to address challenges in the environment through adaptations to cope with the situation. Correspondingly, it has been frequently observed that high-stress intensities can significantly affect our bodily functions which could potentially progress to more severe disorders. Thus, we conducted survey research on high school students in Bangkok using an online questionnaire to determine the impact of exam-related stress on an individual's development of symptoms related to Gastroesophageal reflux disease (GERD). The survey conducted in this research has shown that stress and anxiety from exams are correlated with a person developing GERD symptoms. Albeit it can be concluded that stress from exam expectations influences GERD, further research is required to identify other causes relating to this outcome. Therefore, it is crucial that individuals efficiently manage their stress as it has the potential to prevent the onset of GERD symptoms. Thus, examining the impact of exam-related stress on the development of GERD symptoms among Bangkok high school students can promote awareness about effective stress management to attain healthy well-being.

KEYWORDS: Exams, Gastroesophageal reflux disease, High school, Stress, Symptoms.

INTRODUCTION

Gastroesophageal reflux disease (GERD) is a chronic enteric disorder characterized by the persistent retrograde movement of stomach contents into the esophagus. Common symptoms resulting from this reflux include heartburn, chest pain, and regurgitation which can lead to more severe health problems [1]. Thus, the blockage of stomach acid potentially causes an overgrowth of intestinal bacteria that contributes to liver inflammation frequently observed in 65% of GERD patients [2][3]. From 2006 to 2009, a community-based endoscopic examination was conducted in different regions of Thailand, by Thongbai S. et al. (2013), to determine the prevalence of GERD in the Thai community. The survey revealed that approximately 34.4% of the population experienced reflux symptoms [4]. According to the survey, it is evident that various individuals in Thailand have typical reflux symptoms. Individuals who suffer from the symptoms of GERD are observed to have both physical and mental challenges that can significantly impact their overall well-being and quality of life. The backflow of stomach acid can irritate and inflame the esophageal lining which could cause discomfort, pain, and difficulty swallowing. With these distresses caused by reflux symptoms, it may interfere with individuals' daily activities, leading to frustration and anxiety about effectively managing their daily routines. In addition, nighttime reflux symptoms can disrupt sleep patterns, leading to fatigue, which can augment stress levels. The adverse impacts of reflux symptoms have been further documented by Naliboff, B. D. et al. (2004), where heartburn has frequently been associated with anxiety and emotional instability in which individuals with higher levels of stress tend to perceive acid regurgitation more intensely [5].

According to the World Health Organization (2023), "stress" is defined as a state of worry or mental tension caused by a difficult situation that prompts individuals to address challenges in their lives [6]. Stress can arise from various life occurrences, particularly when we encounter the unfamiliar or unexpected, posing a threat to our identity or when we perceive a lack of control over the circumstances. Confronting stress leads to the production of stress hormones in our body, which triggers a fight-or-flight response and activates our immune system. This biological mechanism allows us to swiftly respond to dangerous situations. Although stress is generally associated with negative outcomes, in moderation, it can act as a positive motivator, driving individuals to achieve their goals and excel in various endeavors. However, excessive stress can lead to detrimental consequences, perpetuating a continuous state

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of fight or flight, leading to feelings of overwhelm and inability to cope adequately. This, in turn, can have significant repercussions on our physical and mental well-being. Therein, managing stress symptoms through coping skills can have numerous health benefits and mitigate the overall impact of stress on an individual's life. In circumstances where coping becomes difficult, seeking professional assistance can be a valuable alternative. Consulting a mental health professional can provide guidance in devising a treatment plan to cultivate positive mental health habits. It is suggested that people who have lower stress levels would have healthier lifestyles. This is supported by research about the stress and health habits in college students at The Ohio State University, USA, conducted by Fogle, G. E. and Pettijohn, T. F. (2013), where the results show that participants who scored low on the perceived stress scale would have better nutrition habits, exercise habits, and time management skills leading to improved well-being [7]. This indicates that there is an association between one's ability to manage stress effectively and the adoption of healthier lifestyle practices.

The prevalence of GERD in Thailand has been documented as 7.4% among the general population of 3120 individuals experiencing heartburn or acid regurgitation [8], so it becomes essential to address this condition proactively. Persistent acid reflux symptoms over an extended period can cause alterations in the esophageal lining, involving changes in esophageal cells that may potentially progress to esophageal cancer. In Thailand, the estimated incidence rate of esophagus cancer is 4.1 cases per 100,000 population in males and 1.6 cases per 100,000 population in females [9]. Correspondingly, the number of Thai high school students with acid reflux symptoms is expected to increase. However, the data on acid reflux symptoms in Thai teenagers is still limited. Therefore, this study aims to examine the impact of exam-related stress on gastroesophageal reflux disease (GERD) symptoms among high school students in Bangkok. By investigating this relationship, this research seeks to provide valuable contributions to society by increasing access to statistics on high school students with acid reflux symptoms and raising awareness about stress management and GERD symptoms to enhance personal health.

METHODOLOGY

To gather all the requisite information for the study, a survey containing 18 questions was created. This survey aimed to evaluate both perceived stress and symptoms of gastroesophageal reflux disease (GERD) among high school students in Bangkok. It was conducted online using the Google Forms platform, with the survey link distributed to high school students from July 17th to August 6th. The stress and anxiety section of the questionnaire was derived from the Depression Anxiety Stress Scale (DASS) by Lovibond & Lovibond (1995) [10]. Additionally, the assessment of GERD symptoms was based on the Gastroesophageal Reflux Disease Health-Related Quality of Life Questionnaire (GERD-HRQL Questionnaire) developed by Velanovich, V. (2007) [11]. Additional questions were added as a preliminary, inquiring about the respondent's gender, age, and school grade. A pilot test of 60 participants was selected to test the internal reliability of the questionnaire by using Cronbach's Alpha reliability test provided by the Statistical Package for the Social Sciences (SPSS) software 29.0. The test yielded a result of 0.933, surpassing the 0.7 threshold necessary for acceptability stipulated by Cortina (1993) [12].

INSTRUMENTS

General Information

1. Please select your gender
2. Please select your age
3. Grade Level

Stress and Anxiety Assessment

1. During exam periods, how often do you experience feelings of stress or nervousness?
2. Rate your overall stress level during exam periods
3. Which of the following physical symptoms do you experience when feeling stressed or anxious during exams?
4. How do you cope with stress and anxiety during exam periods?
5. Have you ever sought support or counseling for managing stress or anxiety during exam periods?

GERD Symptoms Assessment

1. How bad is the heartburn?
2. Heartburn when lying down?
3. Heartburn when standing up?

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4. Heartburn after meals?
5. Does heartburn change your diet?
6. Does heartburn wake you from sleep?
7. Do you have difficulty swallowing?
8. Do you have pain while swallowing?
9. Do you have gassy or bloating feeling?
10. If you take reflux medication, does this affect your daily life?

RESULTS

Table 1: Statistics of the respondents' demographics including gender, age, and grade level (n = 434)

Personal information	Number of participants	Percentage
Gender		
Male	101	23.3
Female	333	76.7
Total	434	100.0
Age		
15	138	31.8
16	151	34.8
17	79	18.2
18	44	10.1
19	22	5.1
Total	434	100.0
Education Level		
Grade 9	68	15.7
Grade 10	108	24.9
Grade 11	141	32.5
Grade 12	117	27.0
Total	434	100.0

According to Table 1, most participants were female, accounting for 76.7%. The samples were mainly split between 15 and 16 years old, comprising over 30% each, about one-fifth were 17. And there were twice as many 18 years old as there were 19 years old. Most respondents were in grade 11, there was not much difference between 10th graders and 12th graders and a small amount of 9th graders.

Table 2: Stress and anxiety during exam periods

Question	Mean rating	Standard Deviation	N
During exam periods, how often do you experience feelings of stress or nervousness?	3.56	1.009	434
Rate your overall stress level during exam periods	3.56	.969	434
Overall descriptive	3.5588	.89294	434

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This table displays the overall descriptive for stress and anxiety levels during exam periods. The mean of responses was 3.5588 with an overall standard deviation of .89294, meaning that they leaned towards feeling stressed during these times.

Table 3: Symptoms when feeling stressed or anxious during exams (multiples are allowed)

Symptoms	**Number of participants**	**Percentage**
Headaches	298	39.1
Muscle Tension	103	13.5
Rapid heartbeat	161	21.1
Stomach discomfort or pain	109	14.3
Shortness of breath	66	8.7
None	4	.5
Others	21	2.8
Total	762	100.0

Almost 40% experienced headaches when feeling stressed and anxious due to examinations. Rapid heartbeat, stomach discomfort, and muscle tension were also common symptoms observed by respondents.

Table 4: Coping strategies (multiples are allowed)

Strategies	**Number of participants**	**Percentage**
Exercising	77	9.0
Talking to close ones	257	30.1
Listening to music	319	37.4
Meditation	174	20.4
Seeking professional help	9	1.0
None	2	.3
Others	15	1.8
Total	853	100.0

Around 30-40% said listening to music and interacting with close friends and families are their preferred coping strategy, whereas 20% consider self-reflection and mediation to be their way of coping.

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Table 5: Willingness to seek support

Statement	Number of participants	Percentage
No, I prefer to manage stress on my own	150	34.6
No, but I am open to seeking support if needed	103	23.7
Yes, I have talked to friends or family	159	36.6
Yes, I have sought professional help	22	5.1
Total	434	100.0

Supporting the earlier table, talking to friends and family are the most common way to seek support, although managing stress alone came in at a close second, this could be because they are listening to music or mediating, which would be supported by the table above.

Table 6: GERD symptoms

Question	Mean rating	Standard Deviation	N
How bad is the heartburn?	.43	.830	434
Heartburn when lying down?	.40	.873	434
Heartburn when standing up?	.35	.752	434
Heartburn after meals?	.42	.823	434
Does heartburn change your diet?	.34	.814	434
Does heartburn wake you from sleep?	.32	.793	434
Do you have difficulty swallowing?	.32	.767	434
Do you have pain while swallowing?	.29	.731	434
Do you have gassy or bloating feeling?	1.00	1.140	434
If you take reflux medication, does this affect your daily life?	.43	.902	434
Overall descriptive	.4293	.61449	434

This table demonstrates the statistical means of responses to having GERD symptoms. The overall mean was .4293 with a standard deviation of .61449, indicating that while most people did not feel strong symptoms during exam periods, the wide deviation may suggest that in some cases symptoms correlate to stress.

Table 7: Descriptive statistics

	Mean rating	Standard Deviation	N
Stress and Anxiety Assessment	3.5588	.89294	434
GERD symptoms	.4293	.61449	434

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Correlations

		Stress and Anxiety Assessment	GERD symptoms
Stress and Anxiety Assessment	Pearson's Correlation	1	.204**
	Sig. (2-tailed)		<.001
	N	434	434
GERD symptoms	Pearson's Correlation	.204**	1
	Sig. (2-tailed)	<.001	
	N	434	434

**. Correlation is significant at the 0.01 level (2-tailed).

At the significant level of 0.01, Pearson correlation showed that stress and anxiety during exam period correlate with GERD symptoms in high school students. The results support our hypothesis on the correlation between both factors.

DISCUSSION

Our survey demonstrated that the impact of stress related to exams has been observed to affect the symptoms of gastroesophageal reflux disease (GERD) in high school students. Numerous studies from the past five years have demonstrated a significant connection between stress and the manifestation of GERD symptoms [13][14][15]. Elevated levels of stress have been associated with an increased likelihood of developing GERD [16]. Instances of acute stress can worsen GERD symptoms by intensifying the perception of responses to acid stimulation in the esophagus [17][18]. Prolonged stressors are also linked to a higher prevalence of GERD symptoms [19]. Additionally, stress has been shown to be correlated with functional gastrointestinal disorders (FGIDs), which include GERD. Moreover, in Thailand, stress has been identified as a predictor of GERD in young patients, and there is a greater occurrence of anxiety and depression among individuals with GERD [20]. This would explain how high school students would develop GERD symptoms due to the stress accumulated during examination periods.

CONCLUSION

This study was initiated to explore the potential link between exam-related stress and gastroesophageal reflux disease (GERD) symptoms in high school students in Bangkok. As per the result, our hypothesis was confirmed by using the Pearson correlation coefficient; reveals significance at the 0.01 level. This means that there is a correlation between stress and anxiety from exams and GERD. However, while our research contributes to understanding the association between GERD symptoms in Bangkok's high school students, it is important to acknowledge that it was conducted in schools in central Bangkok during the summative exam period and the data were self-reported, students might not have accurately recall their stressors and symptoms. Future research studying in the same topic may yield different results. To build upon our findings, we suggest future research to aim to include more diverse samples and other variables which could impact GERD symptoms.

REFERENCES

1. Clinic, (2019). GERD (Chronic Acid Reflux): Symptoms, Treatment, & Causes. Cleveland Clinic. Published December 6, 2019. https://my.clevelandclinic.org/health/diseases/17019-gerd-or-acid-reflux-or-heartburn-overview#:~:text=But%20long%2Dterm%20GERD%20can,pain%2C%20bleeding%20and%20trouble%20swallowing
2. Blocking stomach acid may promote chronic liver disease. National Institutes of Health (NIH). Published October 24, 2017. https://www.nih.gov/news-events/nih-research-matters/blocking-stomach-acid-may-promote-chronic-liver-disease#:~:text=A%20new%20study%20found%20that,may%20worsen%20chronic%20liver%20disease
3. Hassanin, T.M., Foaud, Y., Mohamed, H. et al. Prevalence and risk factors of endoscopically confirmed gastroesophageal reflux disease (GERD) in patients with liver cirrhosis. Egypt Liver Journal. https://eglj.springeropen.com/articles/10.1186/s43066-021-00096-6
4. Treeprasertsuk, S; Thongbai, T; Rattanachuek, T; and Mahachai, V. (2013). Prevalence of GERD in a community-basedexamination in Thailand. Chulalongkorn Medical Journal, 57(3) 3, 293-303. https://digital.car.chula.ac.th/clmjournal/vol57/iss3/3/

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5. Naliboff, B. D., Mayer, M., Fass, R., Fitzgerald, L. Z., Chang, L., Bolus, R., & Mayer, E. A. (2004). The effect of life stress on symptoms of heartburn. Psychosomatic medicine, 66(3), 426–434. https://journals.lww.com/psychosomaticmedicine/Abstract/2004/05000/The_Effect_of_Life_Stress_on_Symptoms_of_Heartburn.23.aspx
6. World Health Organization (WHO). Stress. Published February 21, 2023. https://www.who.int/news-room/questions-and-answers/item/stress#:~:text=What%20is%20stress%3F,experiences%20stress%20to%20some%20degree
7. Fogle, G. E., & Pettijohn, T. F. (2013). Stress and Health Habits in College Students. Open Journal of Medical Psychology, 02(02), 61–68. https://doi.org/10.4236/ojmp.2013.22010
8. Maneerattanaporn, M., Pittayanon, R., Patcharatrakul, T., Bunchorntavakul, C., Sirinthornpanya, S., Pitisuttithum, P., Sudcharoen, A., Kaosombatwattana, U., Tangvoraphongchai, K., Chaikomin, R., Harinwan, K., Techathuvanan, K., Jandee, S., Kijdamrongthum, P., Tangaroonsanti, A., Rattanakovit, K., Chirapongsathorn, S., Gonlachanvit, S., Surangsrirat, S., Werawatganon, D., Piyanirun, W. (2022). Thailand guideline 2020 for medical management of gastroesophageal reflux disease. Journal of gastroenterology and hepatology, 37(4), 632–643. https://doi.org/10.1111/jgh.15758
9. Sriplung, H. Esophagus. Cancer in Thailand: Vol. IV. https://www.nci.go.th/th/File_download/Cancer%20In%20Thailand%20IV/C-II-06.PDF
10. Lovibond, S.H. & Lovibond, P.F. (1995). Manual for the Depression Anxiety Stress Scales. (2nd. Ed.) Sydney: Psychology Foundation.
11. Velanovich V. (2007). The development of the GERD-HRQL symptom severity instrument. Diseases of the esophagus: official journal of the International Society for Diseases of the Esophagus, 20(2), 130–134. https://doi.org/10.1111/j.1442-2050.2007.00658.x
12. Cortina, J. M. (1993). What Is Coefficient Alpha? An Examination of Theory and Applications. Journal of Applied Psychology, 78, 98-104. https://doi.org/10.1037/0021-9010.78.1.98
13. Duan, C., Chen, C., Ouyang, Z., Duan, C., Zhang, S., Shang, H., Zhang, L., Xiang, X., Song, J., Zou, K., Bai, T., & Hou, X. (2021). Association of stress and functional gastrointestinal disorders in high school graduates. Journal of affective disorders, 292, 305–310. https://doi.org/10.1016/j.jad.2021.05.072
14. Sandhu, D. S., & Fass, R. (2018). Current Trends in the Management of Gastroesophageal Reflux Disease. Gut and liver, 12(1), 7–16. https://doi.org/10.5009/gnl16615
15. Bai, P., Bano, S., Kumar, S., Sachdev, P., Ali, A., Dembra, P., Bachani, P., Shahid, S., Jamil, A., & Rizwan, A. (2021). Gastroesophageal Reflux Disease in the Young Population and Its Correlation With Anxiety and Depression. Cureus, 13(5), e15289. https://doi.org/10.7759/cureus.15289
16. Sari, R., Ernawati, D., & Soebadi, B. (2019). RECURRENT APHTHOUS STOMATITIS RELATED TO PSYCHOLOGICAL STRESS, FOOD ALLERGY AND GERD. Odonto : Dental Journal, 6(1), 45-51. http://dx.doi.org/10.30659/odj.6.0.45-51
17. Lee, H. S., Noh, C. K., & Lee, K. J. (2017). The Effect of Acute Stress on Esophageal Motility and Gastroesophageal Reflux in Healthy Humans. Journal of neurogastroenterology and motility, 23(1), 72–79. https://doi.org/10.5056/jnm16119
18. Cho Y. K. (2017). Can Acute Stress Cause Esophageal Hypersensitivity in Healthy Individuals?. Journal of neurogastroenterology and motility, 23(4), 483–484. https://doi.org/10.5056/jnm17118
19. Jang, S. H., Ryu, H. S., Choi, S. C., & Lee, S. Y. (2016). Psychological factors influence the gastroesophageal reflux disease (GERD) and their effect on quality of life among firefighters in South Korea. International journal of occupational and environmental health, 22(4), 315–320. https://doi.org/10.1080/10773525.2016.1235675
20. Maritta, V., Ruthaychonnee, S., & Minna, A. (2017). Survey of adolescents' stress in school life in Thailand: Implications for school health. Journal of child health care: for professionals working with children in the hospital and community, 21(2), 222–230. https://doi.org/10.1177/1367493517708476

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