OPEN ACCESS ORIGIONAL ARTICLE

ASSOCIATION OF ACADEMIC STRESS AND SYMPTOMS OF GASTROINTESTINAL DISORDER IN UNIVERSITY STUDENTS: A CROSS SECTIONAL STUDY.

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ABSTRACT:

OBJECTIVE: To find out the link between the academic stress and the GI symptoms among adults. **METHODS**: A cross-sectional study was conducted in University of Lahore and University of Lahore teaching hospital, Lahore. Total 100 participants were selected through a non probability convenient sampling technique. Pre-tested questionnaires were used for the evaluation of participants. The study was completed in 4 months from October to January. For the data analysis purpose, SPSS version 21.0 was used. In this survey all the individuals aged 18-35 were included. **RESULTS:** Among 100 students, 28% were male while 72% were female and 56% of them had an awareness about this issue whereas, 44% had no idea. Majority of the students (40%) were facing some serious academic stress, along with the number of GI symptoms: Among 100 participants, 27 participants faced severe loss of appetite, 31 participants experienced mild nausea, 15 participants had the urge to defecate during stress. Out of 100 participants, 42 participants were likely to have severe stress according to Kressler Psychological Distress Scale (K 10). **PRACTICAL IMPLICATION:** The study sheds light on the early signs of gastrointestinal symptoms linked to academic stress. As a result, students experiencing these symptoms might recognize them as potential indicators of underlying stress. Early detection can prompt students to seek medical attention, adopt stress-reduction strategies, and prevent the escalation of both stress and gastrointestinal issues. **CONCLUSION:** It was concluded that the majority of participants were suffering from academic stress, and also experienced some of the GI symptoms. Participants reporting higher levels of stress exhibited a greater likelihood of experiencing GI symptoms, reinforcing the notion that psychological well-being has a discernible impact on gut health.

KEYWORDS: Stress, Abdominal pain, Gastrointestinal tract , GIT, Pyrosis.

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How To Cite This Article: Abbas S[1], Munir M[2], Hussain MI[3] , Noor S[4], Zafar S [5], **ASSOCIATION OF ACADEMIC STRESS AND SYMPTOMS OF GASTROINTESTINAL DISORDER IN UNIVERSITY STUDENTS: A CROSS SECTIONAL STUDY.** JPUMHS;2023:13:04,95-100. http://doi.org/10.46536/jpumhs/2023/13.04.477

Received octomber 13.2023, Accepted On 15 December 2023, Published On 31 December 2023.

INTRODUCTION

The word "stress" is frequently used all over the world. In the 1930s, Selye used this phrase for the first time to indicate a "syndrome generated by different nocuous substances." Stress results due to living things (human or animal) inability to react properly with actual and perceived emotional or physical threats[1]. Presently, stress is one of the problems which impacts students on a regular basis. Academic stress can be triggered by several factors that consist of work pressures, academic workload, family dynamics, group activities, lack of technological resources and social problems[2]. College students work hard with stress as they deal with various social, intellectual, and personal challenges[3].All these circumstances causes psychological stress, which might have an impact on several physiological processes in the gastrointestinal tract (GIT), such as gastric secretion, gut movement, mucus permeability, mucosal barrier function, visceral sensitivity, and mucosal blood flow[4]. Academic stressors could lead to an unhealthy coping style, and result in certain Gastrointestinal (GI) symptoms such as stomach ache, heartburn, diarrhea, constipation, nausea, and vomiting[5, 6]. Multiple epidemiological surveys of different nations have shown incidence rates of GI symptoms in students varying from 35% to 70%. According to Norton et al., functional dyspepsia (22.8%), dysphasia (20.5%), and functional heartburn (19.7%) were the most prevalent disorders in the 127 university students in Canada who experienced GI symptom[7]. Another study was carried out on Pakistani students with the goal of identifying the range of FGIDs among an adult Pakistani population that were arranged in groups using the ROME III criteria. Out of 860 participants, 468 people (54.4%) had FGIDs diagnosed. Functional Digestion was the most common symptom (70.2%), along with Functional Bloating (56.6%) and Functional Heartburn (58.9%). Overall FGIDs were diagnosed in 468 subjects[8].

Visceral sensitivity, mucosal blood flow, mucosal permeability and barrier function, gastric secretion, gut motility, and other physiological mechanism of the gastrointestinal system all be impacted by stress. It is usually recognized that experiencing stress can cause various gastrointestinal symptoms, including dyspepsia, diarrhea, and stomach pain. Majority of GI symptoms are made up of Upper dysmotility symptoms and bowel symptoms[9]. The primary changes caused by stress in gut physiology are following: 1) changing of gut motility; 2) an elevation in visceral pain; 3) changes in gastrointestinal secretion; 4) an increased intestinal permeability and 5) unfavorable results on the intestinal microbiota[10].

Two main effects of stress can be on our diet and our gastrointestinal system. First, stress is having an effect on hunger. N-methyl-D-aspartate (NMDA) glutamate receptors in the ventral tegmental area (VTA) or amygdala are involved in this action[11]. Second, stress has a poor effect on the GI tract's normal functioning. Multiple researchers have checked out how stress affects the GI system's potential to work[12]. Stress has an impact on mucus or acid secretion, intestinal permeability, and the absorption mechanism. Stress also elevates the GI system's inflammatory responses and triggers inflammation or hastens the inflammatory response by secreting mediators[13]. Tricyclic antidepressants, a common antipsychotic, and some other medications are included in the pharmacological treatments for stress-related diseases[14]. Regarding dietary habits, High-RSG individuals ate substantially faster than Low-RSG individuals before academic stress. After experiencing work stress, appetite was recorded higher in High-RSG than Low-RSG. Academic stress accounted for 42.2% of snack consumption behaviors in High-RSG while hunger accounted for 31.1% of snack consumption behaviors in Low-RSG. During working hours, High-RSG employees consumed high energy from chocolates, cakes, muffins, and flavored milk than did Low-RSG employees[15]. These are the meals to avoid because they provide a short amount of energy and make you feel dizzy for a very long time. On the contrary, a fiber rich diet provides more appetite satisfaction for a prolonged time period than processed, high-fat, and high-sugar

snacks. A person is said to have greater amounts of vitamins A, and C, and the B vitamins, thiamin, riboflavin, and folate when they replace fast and junk food with fresh, high-fiber plant-based diet. They will also have increased amounts of magnesium, iron, selenium, zinc, phosphorus, and calcium in their body. All of these nutrients are of crucial importance for highly functioning metabolism and they are also beneficent for protection against stress.

The purpose of this study was to find out the knowledge about how different types of stressors are causing GI disturbances in university students and health professionals. In Pakistan, the prevalence rate for GI disorders was 28.3% with a predominance of 85.29% females over males 14.71%. The physiological symptoms related to anxiety among males were 15.7% and females 84.2% respectively. Moreover, to know what difficulties they are going through in daily life due to stress. Different stressors such as academic and physiological stress hinder daily activities and result in causation of GI disorders. We conducted seminars in university campus to make health professionals and students aware of the effects of stress that cause GI disorders.

METHODOLOGY:

Study design: The present study was a Cross-sectional study**. Study setting:** University: The University of Lahore, University of Lahore teaching hospital, Lahore. **Sampling size:** Data was collected from a total 100 number of participants with the age range of 18-35 years. **Sampling technique:** The technique used in this study was non-probability convenient sampling**. Development of instrument:** There was no development of instrument for this study. **Data collection procedure:** In this study, all data were collected randomly through a survey using a detailed self-constructed questionnaire after approval from experts. **Data analysis plan:** The SPSS Tool was suitable for analyzing data extracted from the research interview questionnaire. Results were expressed as mean±S.D. Level of significance is set as p-value ≤ 0.05.

RESULTS:

Table 1: Distribution of demographic characteristics.

Among 100 participants, 2 male and 3 female belonged to lower class, 12 male and 36 female belonged to middle class. The association between gender and socioeconomic class was insignificant (p=0.462). Among 100 participants, 21 participants aged 18-25 had awareness about the disease while 39 participants had no awareness, 13 participants aged between 26-35 had awareness about the disease while 3 participants had no awareness. The association between age and awareness of disease was insignificant (p=0.70). Among 100 participants, 83 participants were undergraduates while 17 were postgraduates.

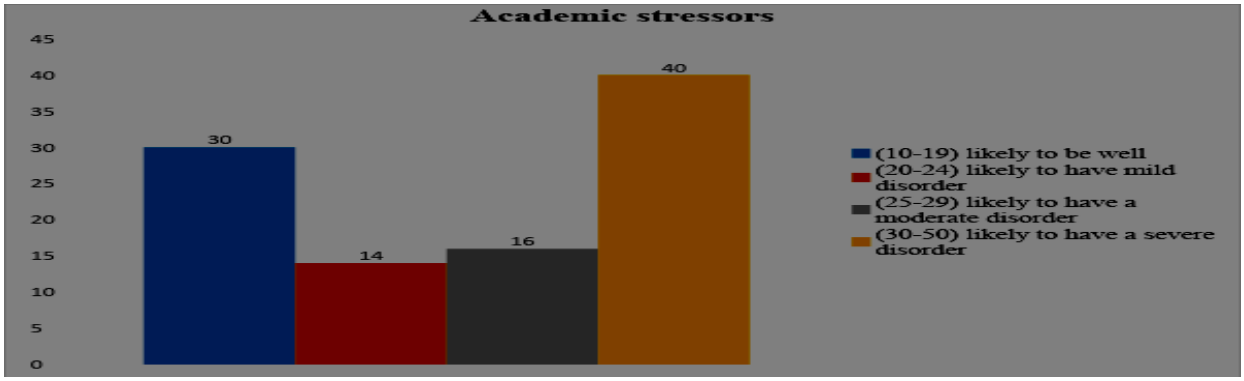
	Demographic characteristics		**Percentage**
1.	**Age of patient**	18-25	81
		26-35	19
2.	**Gender of patient**	Male	28
		Female	72
3.	**Education**	Undergraduate	83
		Post-graduate	17
4.	**Marital status**	Married	19
		Unmarried	81
5.	**Socioeconomic status**	Lower class	5
		Middle class	48
		Upper middle class	38
		Upper class	9
6.	**Medical diagnosis**	Yes	11
		No	89

7.	**Awareness of disease**	Yes	56
		No	44

Table 2: Distribution of GI symptoms among participants. Among 100 participants, 22 participants had mild abdominal pain during stress, 16 participants experienced mild vomiting during stress, 15 participants had mild urge to defecate during stress, whereas 21 participants had mild diarrhea during stress.

Sr no	GI problems	Mild	Moderate	Severe	Never	Total
1	**Abdominal pain**	22	21	16	41	100
2	**Loss of appetite**	24	17	27	32	100
3	**Heart burn**	31	21	10	38	100
4	**Nausea**	31	19	18	32	100
5	**Bloating**	16	19	18	47	100
6	**Vomiting**	21	12	15	52	100
7	**Regurgitation**	21	11	10	58	100
8	**Epigastric pain**	14	16	14	56	100
9	**Urge to defecate**	15	15	14	56	100
10	**Constipation**	17	9	22	52	100
11	**Diarrhea**	21	8	11	60	100

Figure 1: Distribution of Academic Stressors among participants. Out of 100 participants, 40 participants were likely to have severe disorder, 16 participants were likely to have moderate disorder, 14 participants were likely to have mild disorder, and 30 participants were likely to be well.



DISCUSSION:

Current study showed that common symptoms which were responded to "moderate" among 100 participants having irritable bowel syndrome were bloating (19%), abdominal pain (21%), constipation (9%), and (diarrhea 8%). A study conducted by Jahan *et al*., in 2016 on 81 medical students. The most prevalent symptoms were post-meal fullness (34.6%), bloating (37%), abdominal pain (28.4%), diarrhea (7.4%), and constipation (28.4%) [16].

In 2018, Elizabeth Pozos-Radillo et al., carried out a cross-sectional investigation. Examining the relation between IBS and stress from school and contrasting male and female results. The findings showed that IBS is more likely to develop in kids who are academically pressurized and have little or no free time [17].

Current study showed that out of 100 participants 25% were likely to have mild disorder due to psychological stressors. A study conducted by Manabu Araki *et al*., in 2020 to investigate the link between the psychological stress and disease activity in patients with IBD. 75% of IBD patients assumed that psychological stress triggered an exacerbation of their disease[18].

Another study was conducted by Lim SK *et al*., in 2017 to find out how sleep and psychosocial troubles caused functional gastrointestinal

disorders. The basic incidence of irritable bowel syndrome and functional dyspepsia have been 16.5% and 17.1% respectively[19].

Current study showed that out of 100 participants 28% were likely to have mild disorder because of the academic stress. Sang Pyo Lee *et al*., conducted a study, in 2015 to find out how digestive diseases were being triggered by stress and depression, and it was concluded that stress and depression are connected to a lot of digestive diseases, and they may be important factors for some gastrointestinal disorders[20].

An investigation was carried out by Eun Young Lee et al., in 2011, to find prevalence of GI symptoms in nursing students and the co-relation between GI symptoms and academic stress, 715 students in total took part. 65% of the nursing students claimed having two gastrointestinal symptoms, with 31.1% of them reporting having three or more[21].

Current study showed that out of 100 participants 40% were likely to have severe academic stress and were experiencing some gastrointestinal symptoms like constipation and abdominal pain. In 2020, Fanny Söderquist et al., carried out an investigation to find out gastrointestinal-symptoms relation with stress; 491 young adults who received outpatient psychiatric care and 85 healthy controls provided self-ratings. The conclusion states that GI symptoms are linked with stress and anxiety.[22]

CONCLUSION:

It was concluded that the majority of participants were suffering from academic stress, and also experienced some of the GI symptoms. Stress had a crucial role to play in gastrointestinal disorders, a significant association was found between academic stress and few GI symptoms that were nausea, loss of appetite, heartburn and abdominal pain which was affecting their daily life activities.

ETHICS APPROVAL: The ERC gave ethical review approval

CONSENT TO PARTICIPATE: written and verbal consent was taken from subjects and next of kin

FUNDING: The work was not financially supported by any organization. The entire expense was taken by the authors

ACKNOWLEDGEMENTS: We would like to thank the all contributors and staff and other persons for providing useful information.

AUTHORS' CONTRIBUTIONS: All persons who meet authorship criteria are listed as authors, and all authors certify that they have participated in the work to take public responsibility of this manuscript. All authors read and approved the final manuscript.

CONFLICT OF INTEREST: No competing interest declared.

REFERENCES

1. Mawdsley JE, Rampton DS. Psychological stress in IBD: new insights into pathogenic and therapeutic implications. Gut. 2005 Oct 1;54(10):1481-1491.
2. Huerta-Franco MR, Vargas-Luna M, Tienda P, Delgadillo-Holtfort I, Balleza-Ordaz M, Flores-Hernandez C. Effects of occupational stress on the gastrointestinal tract. World journal of gastrointestinal pathophysiology. 2013 Nov 11;4 (4):108-118
3. Ramachandiran M, Dhanapal S. Academic Stress Among University Students: A Quantitative Study of Generation Y and Z's Perception. Pertanika Journal of Social Sciences & Humanities. 2018 Sep 1;26 (3) 2115-2128.
4. Janssen P, Vanden Berghe P, Verschueren S, Lehmann A, Depoortere I, Tack J. The role of gastric motility in the control of food intake. Alimentary pharmacology & therapeutics. 2011 Apr;33(8):880-894.
5. Al-Busaidi Z, Bhargava K, Al-Ismaily A, Al-Lawati H, Al-Kindi R, Al-Shafaee M, Al-Maniri A.Prevalence of Depressive Symptoms among University Students in Oman. Oman Med J. 2011;26(4):235-239.
6. Bhatia V, Tandon R: Stress and the gastrointestinal tract. J Gastroenterol Hepatol 2005; 20:332-339
7. Suarez K, Mayer C, Ehlert U, Nater UM. Psychological stress and self-reported functional gastrointestinal disorders. The Journal of nervous and mental disease. 2010 Mar 1;198(3):226-229.
8. Abid S, Rehman et al., Epidemiology of functional gastrointestinal disorders using ROME III adult questionnaire, a population based cross sectional study in Karachi—Pakistan. 2022; 17(6): e0268403. https://doi.org/10.1371/journal.pone.0268403

9. Lee EY, Mun MS, Lee SH, Cho HS. Perceived stress and gastrointestinal symptoms in nursing students in Korea: A cross-sectional survey. BMC nursing. 2011 Dec; 10 (1):1-8.
10. Konturek PC, Brzozowski T, Konturek SJ. Stress and the gut: pathophysiology, clinical consequences, diagnostic approach and treatment options. J Physiol Pharmacol. 2011 Dec;62(6):591-599.
11. Nasihatkon ZS, Khosravi M, Bourbour Z, Sahraei H, Ranjbaran M, Hassantash SM, Sahraei M, Baghlani K. Inhibitory effect of NMDA receptors in the ventral tegmental area on hormonal and eating behavior responses to stress in rats. Behavioural Neurology. 2014 Jan 1;2014. https://doi.org/10.1155/2014/294149
12. Asalgoo S, Jahromi GP, Meftahi GH, Sahraei H. Posttraumatic stress disorder (ptsd): Mechanisms and possible treatments. Neurophysiology. 2015 Dec;47(6):482-489.
13. Nikoo GB, Khosravi M, Sahraei H, Ranjbaran M, Sarahian N, Zardooz H, Bourbour Z, Aref-Alem M, Jahromi GP, Herferhdoost G. Effects of systemic and intra-accumbal memantine administration on the impacts of plantar electrical shock in male NMRI mice. Physiology and Pharmacology. 2014;18(1):61-71.
14. Dekel R, Drossman DA, Sperber AD. The use of psychotropic drugs in irritable bowel syndrome. Expert opinion on investigational drugs. 2013 Mar 1;22(3):329-339.
15. Park SH, Lee EJ, Chang KJ. Dietary habits and snack consumption behaviors according to level of job stress among 20-to 30-year old office workers in the Seoul metropolitan area. Journal of the Korean Society of Food Culture. 2020;35(2):143-155.
16. Jahan F; Siddiqui M A, Mitwally M et al. Perception of stress, anxiety, depression and coping strategies among medical students at Oman Medical College. Middle East Journal of Family Medicine 2016; 14(7): 16-23
17. Pozos-Radillo E, Preciado-Serrano L, Plascencia-Campos A, Morales-Fernández A, Valdez-López R. Predictive study of academic stress with the irritable bowel syndrome in medicine students at a public university in Mexico. Libyan Journal of Medicine. 2018 Aug 15;13(1). 10.1080/19932820.2018.1479599
18. Araki M, Shinzaki S, Yamada T, Arimitsu S, Komori M, Shibukawa N, Mukai A, Nakajima S, Kinoshita K, Kitamura S, Murayama Y. Psychologic stress and disease activity in patients with inflammatory bowel disease: A multicenter cross-sectional study. PLoS One. 2020 May 26;15(5):e0233365. https://doi.org/10.1371/journal.pone.0233365
19. Lim SK, Yoo SJ, Koo DL, Park CA, Ryu HJ, Jung YJ, Jeong JB, Kim BG, Lee KL, Koh SJ. Stress and sleep quality in doctors working on-call shifts are associated with functional gastrointestinal disorders. World Journal of Gastroenterology. 2017 May 14;23(18):3330-3337.
20. Lee SP, Sung IK, et al., The effect of emotional stress and depression on the prevalence of digestive diseases. J Neurogastroenterol Motil. 2015 Mar 30;21(2):273-282.
21. . Lee EY, Mun MS, Lee SH, Cho HSM. Perceived stress and gastrointestinal symptoms in nursing students in Korea: A cross-sectional survey. BMC Nurs [Internet]. 2011;10(1):22. 10.1080/19932820.2018.1479599
22. Fanny Söderquist, Mikaela Syk, David Justet al. Gastrointestinal symptoms, depressive symptoms and trait anxiety in young adults. BMC Psychiatry (2020) 520:535