

Correlation of Perceived Stress and GI symptoms in Medical Students in Oman

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ABSTRACT:-

Objective

The main purpose of this study was to assess the prevalence of GI (gastro- intestinal) symptoms in medical students and to examine the association between the perceived stress and GI symptoms

Methods

A cross-sectional descriptive study design was used in which medical students of college of Medicine and Health Science (COMHS), Sohar, Oman were recruited. The Perceived Stress Scale and a GI Symptoms Questionnaire were administered through a self-reported system. Data was analyzed using IBM SPSS, version 24.0 (IBM Corp, Armonk, NY, USA).

Results

A total 81 students participated, of which 71 were female (87.7%) and 65.4% resides within campus. Among all, 16% had excellent and 48.1% good health status. A normal BMI was reported in 54.3%. Among the symptoms which were responded to as “very often”, were post-meal fullness (34.6%), bloating (37%), abdominal pain (28.4%), diarrhea (7.4%), and constipation (28.4%). About 62% of the study population often felt nervous and stressed in last month. Irritable Bowel Syndrome found in 21%. A significant association ($p < 0.001$) was observed between perceived emotional stress and two upper dysmotility symptoms (post meal fullness in abdomen and bloating).

Conclusion

This study indicated that GI symptoms were prevalent among the medical students. A significant level of perceived stress was also displayed. Furthermore, a significant correlation was found between stress and two upper dysmotility symptoms.

Keywords:- Perceived stress, gastrointestinal symptoms, irritable bowel syndrome, medical students

I. INTRODUCTION

Stress in medical students is caused by strenuous medical programs, which may have physical and psychological effects on the well-being of medical students [1]. Stress and anxiety in medical students is common entity but some students can cope these stresses appropriately while others may show physical sign and symptoms [2]. Stressors could lead to a negative coping style, burnout, and psychological morbidity. Unexplained physical complaints, as a whole, fatigue, headache, stomach upset, nausea, diarrhea, constipation, dizziness, and musculoskeletal pains were more commonly reported in individuals with an anxiety disorder and/or depression [3-4]. Gastrointestinal (GI) disturbances commonly include symptoms of stomach pain, heartburn, diarrhea, constipation, nausea, and vomiting. When no medical cause for GI disturbances is found, they are often termed “functional GI symptoms”. Many studies have shown a correlation between anxiety, depression and functional GI symptoms especially irritable bowel syndrome (IBS) [5-6]. People who have at least one GI symptom are more likely to have an anxiety disorder or depression than those without any GI symptoms. Other common GI symptoms that have been associated with anxiety disorders include: Irritable Bowel Syndrome (IBS), stomach pain, flatulence (gas), bloated or swollen abdomen, mucus in the stool, Gastroesophageal reflux disease (GERD), chest pain, difficulty swallowing, hoarseness of the voice, especially upon waking, persistent dry cough, mild pain or stuck in throat type sensations [7-8].

High level of physical and psychological distress is seen in medical students because of high academic demand [9-10]. Although medical students frequently complain of GI symptoms and are often absent from class due to these complaints, little is known about the prevalence of GI symptoms among students. Stress and GI symptoms include gastrointestinal motility mediated by a visceral nervous system, the immune system, and the hypothalamic-pituitary-adrenal axis. Many times etiology of GI symptoms is not clear and it is under reported thinking this is a normal variation in stress full situations [11-12]. However, there has been limited research on the relationship between stress and GI symptoms in medical students. The main purpose of this study was to assess the prevalence of GI symptoms in medical students and to examine the association between the perceived stress and GI symptoms.

II. Methods

This study was designed as a cross-sectional descriptive study to assess the prevalence of GI symptoms in medical students of CMHS Sohar. A favorable ethical opinion was obtained from institutional research ethics committee prior to data collection. Students were informed that (a) their participation was voluntary, (b) they could refuse to answer any item, and (c) there would be no adverse consequences for refusal. Signed informed consent to participate was obtained from all subjects.

Questionnaire was administered through a self-reported system. The self-report questionnaire included general information, as well as the Perceived Stress Scale (PSS) and the GI Symptoms. The PSS measures the degree to which situations in one's life over the past month are identified as stressful. Items are designed to assess how unpredictable, uncontrollable and overloaded respondents find their lives.

PSS scores were obtained by reversing responses to the four positive items and then summing across all scale items. A higher score means a higher level of perceived stress. GI symptoms were assessed using the 16-item Gastrointestinal Symptoms Questionnaire. The questionnaire has five symptom categories: esophageal symptoms, upper dysmotility symptoms, bowel symptoms, diarrhea, and constipation. The items focus on the frequency of GI symptoms over the past three months. Symptoms are based on ROME IV criteria. Responses were recorded on a 5-point Likert scale, ranging from not at all (0) to very often (4). The response options of "often" and "very often" were used to identify a symptom. Cronbach's alpha in this sample was 0.85.

All collected data were transferred and analyzed using IBM SPSS, version 24.0 (IBM Corp, Armonk, NY, USA). Data was expressed in frequencies for questionnaire responses calculated for all variables in numbers and percentages, t test was used as a test of significance to compare differences between groups. Significance will be set at $p < 0.05$ level.

III. RESULTS

A total eighty one (N=81) students participated in the study of which 71 were females (87.7%) and 10 were males (12.3%). Among all, 58 students (71.6%) were below 24 years of age. 13.6% of study participants resides in parent's house, 65.4% within campus, and 21% were staying in out campus accommodation. The smoking rate was 1.2%. Self-evaluation for health status was 16% excellent, 48.1% good, 32.1% Fair, and 3.7% Poor. A normal BMI was reported in 54.3% of study participants (Table 1).

Table 1: Selected Demographics

	Characteristics	N (%)
Gender	Female	71 (87.7)
	Male	10 (12.3)
Age	<24 years	58 (71.6)
	≥25	23 (28.4)
BMI	<18.5	9 (11.1)
	18.5-24.99	44 (54.3)
	25-29.99	23 (28.4)
	≥30	5 (6.2)
Smoking Status	Yes	1 (1.2)
	No	80 (98.8)
Residence	With family	11 (13.6)
	Within campus	53 (65.4)
	Outside campus	17 (21)
Health Status	Poor	3 (3.7)
	Fair	26 (32.1)
	Good	39 (48.1)
	Excellent	13 (16)

Among the symptoms which were responded to as “often” and “very often”, were post-meal fullness (34.6%), bloating (37%), abdominal pain (28.4%), diarrhea (7.4%), and constipation (28.4%) (Table 2).

Table 2: Prevalence of Gastrointestinal Symptoms

	Not at all N (%)	Sometimes/Rarely N (%)	Very often/Often N (%)
Abdominal pain	15 (18.5)	43 (53.1)	23 (28.4)
Esophageal symptoms			
Dysphagia	51 (63)	25 (30.9)	5 (6.2)
Heart burn	37 (45.7)	28 (34.6)	16 (19.8)
Upper dysmotility symptoms			
Nausea	29 (35.8)	39 (48.1)	13 (16)
Vomiting	65 (80.2)	11 (13.6)	5 (6.2)
Early satiety	38 (46.9)	28 (34.6)	15 (18.5)
Post meal fullness in abdomen	21 (25.9)	32 (39.5)	28 (34.6)
Bloating	20 (24.7)	31 (38.3)	30 (37)
Bowel symptoms			
Diarrhea / > 3 bowels each day	43 (53.1)	32 (39.5)	6 (7.4)
Constipation	37 (45.7)	21 (25.9)	23 (28.4)
Urgency of stool	55 (67.9)	22 (27.2)	4 (4.9)
Incontinence of stool	75 (92.6)	4 (4.9)	2 (2.5)

Participants were asked multiple questions regarding perceived stress component (Table 3). 62% of the study population often felt nervous and stressed in last month. Approximately half of students (49.4) often felt upset because of something that happened unexpectedly over the past one month. Similarly, 53.1% reported that they often unable to control the important things in their life. Nearly, one fourth (22.2%) of the student often felt that they were on top of things in last month. Upon statistical analysis, significant association ($p < 0.001$) was observed between perceived emotional stress and two upper dysmotility symptoms (post meal fullness in abdomen and bloating).

Table 3: Perceived Stress among Medical Student (previous month)

	Not at all N (%)	Sometimes N (%)	Fairly Often N (%)	Very often N (%)
How often have you been upset because of something that happened unexpectedly?	3 (3.7)	38 (46.9)	26 (32.1)	14 (17.3)
How often have you felt that you were unable to control the important things in your life?	7 (8.6)	31 (38.3)	25 (30.9)	18 (22.2)
How often have you felt nervous and stressed?	3 (3.7)	27 (33.3)	27 (33.3)	24 (29.6)
How often have you felt confident about your ability to handle your personal problems?	7 (8.6)	44 (54.3)	21 (25.9)	9 (11.1)
How often have you felt that things were going your way?	8 (9.9)	42 (51.9)	20 (24.7)	11 (13.6)
How often have you found that you could not cope with all the things that you had to do?	6 (7.4)	36 (44.4)	29 (35.8)	10 (12.3)
How often have you been able to control irritations in your life?	10 (12.3)	37 (45.7)	25 (30.9)	9 (11.1)
How often have you felt that you were on top of things?	14 (17.3)	49 (60.5)	13 (16)	5 (6.2)
How often have you been angered because of things that were outside of your control?	10 (12.3)	33 (40.7)	26 (32.1)	12 (14.8)
How often have you felt difficulties were piling up so high that you could not overcome them?	8 (9.9)	38 (46.9)	21 (25.9)	14 (17.3)

IV. DISCUSSION

In this study, we assessed the prevalence of GI symptoms among medical students (N=81) and examined the association between the perceived stress and GI symptoms. A significant correlation ($p < 0.001$) was found between perceived emotional stress and two upper dysmotility symptoms (post meal fullness in abdomen and bloating). This result is similar to the findings of previous studies reported in literature that medical students are at higher risk of experiencing IBS comparing to other students. Our study has shown 21% of prevalence of IBS based on Rome IV criteria. A study from Saudi Arabia reported 18% of the participants have been diagnosed with IBS and 28.5% fit Rome IV criteria for the diagnosis of IBS. This study concluded that stress and lack of exercise are two major risk factors of IBS [13].

Our study result has shown significant association of stress and GI symptoms. One study done on nursing students have shown that GI symptoms are highly prevalent, 65% had one or more than one GI symptoms significantly associated with the perceived stress level. Most of the nursing students complained of upper dysmotility and bowel symptoms same as reported in our study [14].

Tan et al has reported GI symptom IBS were common among young Malaysians, with a prevalence rate of 15.8%, significantly more in women with constipation-predominant IBS subgroup. A significantly higher prevalence of psychological and psychosomatic symptoms was found in individuals with IBS in that study. In our study, the third most prevalent GI symptom was constipation [15]. Medical students experience more stress than other population due to the stressful academic environment and non stop stress and anxiety in clinical rotation patient care, a major factor that has increased the prevalence of GI symptoms and IBS among them [16]. In modern era Medical education is among the most challenging and the most stressful education which can lead to many physical symptoms. One study from Jeddah has shown prevalence of IBS 31.8% among medical students and interns with female gender, morbid anxiety, living in school dormitory, emotional stress, and higher educational level (grade) were the predictors of IBS [17].

In our study we found significant stress in medical student's clinical years. One study from Pakistan has shown prevalence of IBS with psychological symptoms of anxiety in more than half of the participants [18] stressful and challenging environments, medical students are predisposed to have high rates of IBS Irritable bowel syndrome (IBS) is a highly prevalent gastrointestinal disorder that has an incontrovertible impact on

health care and patients' quality of life. These results are in agreement with study in which majority of the students experienced more than one GI symptom including post-meal fullness in abdomen, bloating, abdominal pain. According to previous studies held in Lebanon, stated that the prevalence of IBS among university students was significantly higher [19]. This study revealed that, 62% of the study population often felt nervous and stressed in last month. Approximately half of students (49.4) often felt upset. These findings are parallel to the results of previous studies. A recent quantitative study reported that, 40% of students in an Indian University suffered from stress [20]. IBS was present significantly higher among students who experience emotional stress in the past 6-month (25.4%) and higher among students with a positive family history of IBS. Moreover, IBS was associated with a decrease in the academic performance among medical students reported in literature [21]. A cross sectional study in Kuala Lumpur concluded that the biomedical science undergraduates experienced stress due to a number of factors including personal or financial problems [22].

In our study more than half students have shown anxiety and stress, students with academic overload and lack of time are at risk for developing GI symptoms, same results are reported in the literature [23-24]. AlAqeel et al reported that the prevalence of GI symptoms specially IBS 21% higher among females and students had moderate or high levels of anxiety, the same result our study has shown [25]. In the present study, we found an association between perceived stress and GI symptoms among medical students, studies has shown GI symptoms that are highly prevalent among nursing students are significantly associated with the perceived stress level and high perceived stress should be considered a risk factor for GI symptoms. To reduce perceived stress, stress management programs are recommended [26]. The recommendation is to implement educational programs aiming at self-care as well as gaining knowledge about academic stress-related factors and the physical responses [27].

While more studies are needed to determine its exact prevalence among medical students, more studies are also needed to investigate its impact on students' quality of life. Meanwhile, reducing risk factors and implementing preventive strategies are essential to control the disease and lessen its undesirable outcomes.

V. CONCLUSION

Thus, this study indicated that GI symptoms were prevalent among the medical students. A significant level of perceived stress was also displayed. Furthermore, a significant correlation was found between stress and two upper dysmotility symptoms (post meal fullness in abdomen and bloating). More such elaborate studies are required to assess the existing stress and prevalence of GI symptoms among University students. It is also very important to raise awareness about GI symptoms and stress management among students. In addition, preventive strategies should be adapted to decrease the negative consequences of stress and disease.

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