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Stress among Medical Students in the Gaza Strip

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Abstract:

Background: Stress is recognized as a worldwide phenomenon. Medical students around the world suffering from psychological stress and decrease life satisfaction and academic performance**.**

Aim: The study aims to identify the prevalence of stress among medical student in the Gaza Strip.

Study design: Across- sectional- descriptive analytical design was used to conduct the study.

Sample and sampling: stratified random sampling. The target participants were the medical students from AL-Azhar & Islamic university in the Gaza Strip, the sample was 250 students. 138 students from AL-Azhar University and 112 students from Islamic University of both sexes.

Methods: A self-administered online questionnaire was used to collect the data. The questionnaire included two parts. First, personal characteristics, Second, modified Medical Stressor Questionnaire (MSSQ-40).

Results: Revealed that the prevalence of stress among medical students was found to be 48.25%:, classified as moderate stress. Academic stress with an average of (63%), was the first stress among medical students, and was rated as high stress, followed by teaching and learning stress, (55.75%) which considered high. While, social pressure (49.75%), group activity (44.25%), drive and desire (39%), and intrapersonal and interpersonal stress (37.5%) are - classified as moderate stress. The average stress due to heavy curriculum in the academic domain was the highest one with a score of 78% classified as severe stress. Academic stress during the clinical training (65.75%) was higher than the pre-clinical training years (61%). No statistical differences were detected in term of gender regarding stress.

Conclusion: There are several sources of stress affecting medical students. Academic-related stress were the major and the first stressor among medical students.

Recommendations: Medical faculties should care about medical students. This is possible by providing effective stress reduction strategies, counseling and- a balanced curriculum.

Keywords:

Stress, Medical Students, Stressors, Academic Stress

1-Background

Over 50 years ago, Hans Selye, the father of stress research, began studying the phenomenon of stress (**Selye, (1956**). He defines stress as the body's non-specific response to a request (**Tan & Yip, 2018)**. In the 20th century, stress has been recognized as an illness and it is seen as a complex exchange between people and their situations **(John & Naik, 2020**). Stress will be one of the primary causes of disability in the future **(Gavali & Deore, 2018).** Stress is currently understood as a lifestyle crisis affecting anyone. It has its place in students' academic life due to various internal and external factors **(Reddy et al., 2018).** Besides that, the faculty of medicine environment is motivating psychological problems among undergraduate medical students **(Battula et al., 2020).** Overall, the medical education system is extremely rigorous and significantly impacts the mental and physical health of medical students. Medical school is one of the most demanding academic programs in the world. Fear of exams, high parental expectations, pressure from peers, lack of free time, financial concerns and relationships are all known factors contributing to the development of stress among medical students **(Rajajeyakum, 2018).** Throughout the years of the study, students make use of numerous adaptive coping techniques to deal with external and internal needs. Medical students accept as true that their lives might be stepped forward if those challenges are removed **(Abouammoh et al., 2020).** The academic system plays a big problem which causes expanded pressure degrees among students. Some of the sources encompass inadequate facilities, overcrowded lectures, a grading system & lengthy hours **(Reddy et al., 2018).** Medical students are reported to experience higher levels of stress than other population groups and students in other academic fields **(John & Naik, 2020).** A scientific review of 40 studies concluded that medical students had a higher prevalence of hopelessness and stress than non-medical students and that stress among medical students results in lower concentration, the occurrence of errors, and dishonesty throughout examinations **(Saeed et al., 2016).** Medical students face psychosocial and environmental issues that can affect their academic abilities and academic performance (**Anuradha et al., 2017**). A study in Bangladesh found that half of the Bangladeshi medical students were affected by academic stress and mentioned that gender is an aspect related to stress (**Eva et al., 2015).** According to researcher experience there is no specific study was conducted in Gaza regarding Stress among Medical Students. Therefore, the current study aimed to assess the level of perceived stress and sources of stressors among medical students.

1.1 Problem statement

Stress has become one of the major problems in medical science education among medical students. Medical students around the world suffering from psychological stress and decreased life satisfaction and academic performance. Several studies reported the importance of this problem.

Medical education is considered to be one of the most academic and emotionally demanding training programs which lead to a negative effect on medical students' psychological well-being and may lead at the end to depression (Satpathy et al., 2021). The situation in Gaza is unique and more difficult because it considering the challenges that medical students face during the wars and who receive training in a very difficult situation with very limited resources and workload. According researcher experience in Gaza, this problem need to be highlighted to determine the prevalence of stress, possible causal stressors, and to give a full picture of the phenomenon, and suggest solutions to decrease stress among medical students**.**

1.2 Significant of the problem

Stress has become internationally one of the major problems among medical students at faculties of medicine and there is a lot of international research that shows that medical education is stressful, the prevalence of stress among medical students ranges from 20.9% to 94.5% (Satpathy et al., 2021). The prevalence of stress of the study done in Bangladeshi in 2015 were reported 53% of male and 55% of female students' suffering from stress (Eva et al., 2015). High stress among medical students can cause physical, intellectual problems, and might have an effect on medical student educational achievement, result in lessening students' self-esteem, lead to depression, drug abuse, burnout, and even suicide **(Hotoleanu & Hotoleanu, 2021).** Several researches were done and every year try to learn more and more about stress programs for reducing stress among university student and recently among medical student (Satpathy et, al., 2021). According researcher experience, there are no published studies that examined stress and its predictors among medical students in Gaza. The researcher conduct this study to determine the prevalence of stress and causal stressors among medical students at faculties of medicine in the Gaza Strip. This study will be a good base for academic, researchers, and medical school administration to build up their research study in the future and to adopt effective stress-relief strategies to improve health and academic performance for medical students.

2- Methods and Materials

2.1 Design, population, setting, and sampling

Across- sectional- descriptive design was used in this study. The population of this study involved all medical students who are studying at the faculties of medicine in the Gaza Strip from the first to sixth year. The study was carried out between April 2022 and September 2022. A stratified random sampling of 250 students participated in the study was used, 138 students from AL-Azhar University and 112 students from Islamic University of both sexes completed the questionnaire through Google form.

2.2 Study instrument

A self-administered online questionnaire was used to collect data. The questionnaire include 2 sections, First, contain 3 items related to demographic characteristics, gender, medical school in the Gaza Strip and year of study. A total of 250 medical students participated in the study. Students were mainly from Al-Azhar University-Gaza and the Islamic University of Gaza. More than half of the Respondents were from AL-Azhar University 138 (55.2%), 112 (44.8%) were from Islamic University and 132 (52.8%) were females from both universities and 118 (47.2%) were males. And About one-third of the students were in the first studying year77 (30.8%), second year 37 (14.8%), third year 51 (20.4%), fourth year 28 (11.2%), fifth-year (12.0%), sixth year 27(10.8%). Characteristics of Respondents are reported in Table (2.1).

Table (2.1): Demographic characteristics of the study respondents

Character	Frequency	Percent
Faculty of Medicine at		
AL-Azhar University-Gaza	138	55.2
Islamic University-Gaza	112	44.8
Gender		
Female	132	52.8
Male	118	47.2
Year of Studying		
First	77	30.8
Second	37	14.8
Third	51	20.4
Fourth	28	11.2
Fifth	30	12.0
Sixth	27	10.8

Second section contain the modified medical student stressor questionnaire. MSSQ was developed by Yusoff,(2011) to assess stressors faced by medical students and to measure the intensity of stress caused by stressors. **(Yusoff & Rahim, 2010).** The questionnaire included six areas of stress, with a total of 40 items, categorized as mild, moderate, high, and severe. These areas include Academic Stressors (ARS), Interpersonal, Intrapersonal Stressors (IRS), Teaching and Learning Stressors (TLRS), Social -Related Stressors (SRS), Desire-Related Stressors (DRS), and Group activity Stressors (GARS). Each item of MSSQ was scored on a 5-point Likert scale ranging from "no stress (score 0)" to "severe stress (score 4)". The average score is explained as follows: Mild stress (0 to 1), medium level (1.01 to 2), high stress (2.01 to 3), and severe (3.01 to 4). More details about the domain are described as:

Academic-Related Stressors (ARS): This domain consisted of 14 questions. Academic-related stressors refer to any scholastic, university, college, educational, or student events that cause stress among students. These include examination systems, assessment methods, grading methods, study schedules, and student activities related to academic events such as poor test scores, high expectations for learning, a lot to learn, content difficult to understand and time constrain for revision.

Interpersonal and Intrapersonal Related Stressors (IRS): It refers to any form of relationship between and within individuals that cause stress. Interpersonal stressors are often linked to our internal relationships, including a lack of motivation to learn and conflicts with oneself. Intrapersonal stressors are often related to relationships between individuals, including verbal, physical, and emotional abuse by others, as well as conflict with staff, faculty, and colleagues.

Teaching and Learning-Related Stressors (TLRS): It is any stressful event related to teaching or learning. These are generally related to the relevance of the tasks that teachers give to students, the ability of teachers to supervise and teach students, the quality of feedback from teachers to students, support students, and the clarity of learning objectives given by teachers.

Social Related Stressors (SRS): Societal stressors are any form of community and social relationships that cause stress. This is often related to free time with family and friends, working with the public, personal time, interruptions from the work of others, and problems faced by patients.

Drive and Desire Related Stressors (DRS): Refer to any form of internal or external forces that influence a person's attitudes, emotions, thinking, and behavior, resulting in stress. It is usually related to the reluctance to study medicine for various reasons, such as choosing to study medicine on your own, poor choice of courses, depression after facing the reality of studying medicine, parents wishing to study medicine, and following a friend to study medicine.

Group activities-Related Stressors (GARS): It refers to any group events and interactions that cause stress. It generally relates to participation in group discussions, group presentations, and others' and expectations to do well. It is understandable as most of the educational activities in medicine involve group activities.

2.3 Statistical analysis:

The Statistical Package for the Social Sciences (SPSS), version 23, was used for data analysis. A descriptive analysis (range, mean, standard deviation, and percentage) was performed. The correlation coefficient was used to test the validity of the correlation between each segment of a field

and the field as a whole. Cronbach's α test was used to test the reliability of the questionnaire. Utilizing independent Student's t-tests, one-way ANOVA, and post hoc tests.

2.4 Ethical issues:

Before conducting the study, the researcher obtained ethical approval from Helsinki Committee in the Gaza Strip and an official letter of approval obtained from the Research Ethics Committee at the Islamic University of Gaza. Respondents received a thorough written description of the objectives and nature of the study. Respondents were assured that their participation was voluntary. Data were collected from all Respondents and confidentiality was maintained.

3- Results

The prevalence of stress among medical students was 48.25% and considered moderate stress. Academic-related problems were the major and the first stressor faced by medical students with an average of 63%, which was rated as high stress, followed by teaching and learning stressors at 55.75%, which rated also as high stress. While, group activities , drive & desire, interpersonal & intrapersonal, and social-related stressors were considered as moderate stressors. The level of academic stress among medical students during the years of clinical training 65.75%, which is higher than in the pre-clinical training years (61%). Regarding gender variations, no statistical differences were found in terms of stress. Descriptive statistics of MSSQ – domains are depicted in Table (3.1).

Table (3.1): Frequency, percentage, mean, and standard deviations of MSSQ -6 domains (n=250)

Stress Causing / Stressors	Mild stress	Mod. Stress	High stress	Severe stress	Mean (SD)	Relative mean %	Class.	Rank
	n (%)	n (%)	n (%)	n (%)				
Academic related stressor	5 (2)	50 (20)	150 (60)	45 (18)	2.52 (0.63)	63	High stress	1
Teaching and Learning Related Stressor	17 (6.8)	90 (36)	104 (41.6)	39 (15.6)	2.23 (0.80)	55.7	High stress	2
Group Activities Related to Stressor	61 (24.4)	103 (41.2)	71 (28.4)	15 (6)	1.77 (0.84)	44.25	Mod. stress	4
Drive & Desire Related Stressor	111 (44.4)	57 (22)	50 (20)	32 (12.8)	1.56 (1.3)	39	Mod. stress	5
Interpersonal & Intrapersonal Related Stressor	94 (37.6)	84 (33.6)	58 (23.2)	14 (5.6)	1.5 (0.96)	37.5	Mod. stress	6
Social Related Stressor	37 (14.8)	100 (40)	92 (36.8)	21 (8.4)	1.99 (0.82)	49.75	Mod. stress	3
Mean of responses	**23 (9.2)**	**103 (41.2)**	**114 (45.6)**	**10 (4)**	**1.93 (0.65)**	**48.25**	Mod. stress	-

The difference in the mean of stressors about students' characteristics is reported in Table (3.2). t-test was used to find the statistical difference in means of stressors domains between students' characteristic variables of two categories: the faculty name and the student gender. Thus, the mean of ARS among Al-Azhar University (AUG) students (2.4±0.65) was lower than what it was among IUG students (2.66±0.59) with a significant statistical difference (p=0.002). However, no other significant statistical difference in all other stressor domains between the two universities was detected. Similarly, the situation in gender character has no significant statistical difference in all other stressor domains except the desired related stressor which represents that the mean of stress among males was 1.40 ±0.97 and 1.75±0.84 among females (p=0.03). Both ARS and DRS indicated statistically significant differences in means of the year of a study comparing pre-clinical years (from 1st to 3rd year) to clinical years (from 4th to 6th). Thus, the mean of stressors for students in pre-clinical years was 2.44±0.59 for academic stressors and 1.4±1.3 for desired related stressors compared to 2.68±0.68 and 1.88±1.4 among students in clinical years respectively, with significant statistical differences (p=0.005, 0.006). Moreover, a one-way ANOVA statistical test was used to find the statistical differences in means of stressors domains between students' characteristics variables of more than two categories such as year of studying. As a result, the means of ARS among students in different years of studying have differed with a significant statistical difference (p=0.001). Moreover, a post hoc statistical test were run to determine the significant statistical differences between which two specific means. The table(3.2) represents that the difference in means was between students in the second year and those who were in the 6th year and 3rd year (2.26 ±.54 *versus* 2.82 ±0.77) and (2.26 ±.54 *versus* 2.72 ±0.58) respectively. Similarly, finding in GARS domain which represents that the difference in means was between students in the second year and those who were in the 6th year and 3rd year (1.89±0.68 *versus* 2.48 ±1.03) and (1.89±0.68 *versus* 2.58 ±0.78) respectively, in addition to difference between those in 3rd and 4th year (2.58 ±0.78 *versus* 1.99±0.84). Furthermore, finding in DRS domain represents that the difference in means was between students in the first year and 5th year (1.3±1.3 *versus* 1.7 ±1.3).

Table(3.2): Mean difference of stressors about students' characteristics

Stressor		**ARS**	**GARS**	**TLRS**	**DRS**	**IRS**	**SRS**
Character	**Group**	**Mean (SD)**	**Mean (SD)**	**Mean (SD)**	**Mean (SD)**	**Mean (SD)**	**Mean (SD)**
Faculty of Medicine	**AUG**	2.4 (0.65)	2.26 (0.76)	1.76 (0.84)	1.61 (1.2)	1.60 (0.92)	1.940 (0.78)
	IUG	2.66 (0.59)	2.19 (0.86)	1.79 (0.83)	1.51 (1.3)	1.39 (0.99)	2.053 (0.84)

Stressor		ARS	GARS	TLRS	DRS	IRS	SRS
Character	**Group**	**Mean (SD)**	**Mean (SD)**	**Mean (SD)**	**Mean (SD)**	**Mean (SD)**	**Mean (SD)**
	T	3.1	0.694	0.254	0.590	1.66	1.09
	P	0.002*	0.489	0.800	0.555	0.098	0.277
Gender	**Male**	2.46 (0.63)	2.26 (0.76)	1.82 (1.1)	1.40 (.97)	1.52 (1.1)	1.99 (0.80)
	Female	2.58 (0.63)	2.19 (0.86)	1.79 (0.9)	1.75 (0.84)	1.49 (0.9)	1.99 (0.83)
	T	1.51	0.694	0.91	2.11	0.291	0.013
	P	0.132	0.489	0.321	0.03*	0.771	0.990
Year of Studying	**Pre-clinical (n=165)**	2.44 (0.59)	2.20 (0.75)	1.72 (0.82)	1.4 (1.3)	1.48 (0.95)	1.96 (0.81)
	Clinical (n=85)	2.68 (0.68)	2.3 (0.89)	1.88 (0.87)	1.88 (1.4)	1.56 (0.99)	2.06 (0.83
	T	2.84	1.01	1.44	2.76	0.638	0.912
	P	0.005*	0.312	0.149	0.006*	0.524	0.363
Year of Studying	**1st[a]**	2.42 (0.58	2.20 (.69)	1.92 (.87)	1.3 (1.3)	1.42 (0.92)	1.8 (0.76)
	2nd[b]	2.26 (.54)	1.89 (.68)	1.57 (.87)	1.7 (1.4)	1.42 (1.01)	1.8 (0.85)
	3rd[c]	2.72 (0.58)	2.58 (.78)	1.51 (.53)	1.7 (1.2)	1.67 (0.92)	2.2 (0.81)
	4th[d]	2.55 (0.65)	1.99 (.84)	1.80 (.88)	1.73 (1.2)	1.54 (0.96)	1.894 (0.85)
	5th[e]	2.68 (0.61)	2.45 (.74)	1.82 (.81)	2.23 (1.3)	1.51 (0.93)	2.189 (0.76)
	6th[f]	2.82 (0.77)	2.48 (1.03)	2.03 (.88)	1.69 (1.3)	1.63 (0.1.1)	2.1 (0.88)
	F	4.689	5.11	2.367	2.938	0.511	1.798
	P	0.001*	0.001*	0.040*	0.01*	0.768	0.114
	Post hoc	**b *vs* c**	**b *vs* c**	-	**a *vs* e**	-	-
	P	0.009	0.001	-	0.020	-	-
		b *vs* f	**b *vs* f**				
		0.003	0.022				
			c *vs* d				
			0.030				

4- Discussion

This study aimed to identify the prevalence of stress among medical students in Gaza. Results revealed that the mean of all stressors, in general, was 1.9 ± 0.65 and the relative mean was 48.25% which was classified as moderate stress. Academic stress was the first stressor facing medical students. considered as high stress, followed by teaching and learning stressors and also considered high. While, group activities, drive & desire, interpersonal & intrapersonal, and social stressors which were considered moderate stressors. Moreover, the study did not reveal any statistical differences regarding gender variations found in terms of stress. According to numerous studies, primary sources of stress were academic and teaching-learning stressors. Medical school is

considered a source of stress and anxiety for students, as it involves a difficult curriculum and time-consuming classes. Academic stress is painful for everyone involved. Stress is an emotionally unstable state that makes it difficult to concentrate and complete daily tasks. Medical students aren't any exception to this phenomenon **(Qamar et al., 2015).** Many studies have been done regarding stress among medical students to understand the underlying stressors and to safeguard the well-being of students **(Mohammed, 2016).** Stress is an uncomfortable experience and leads to feelings of fear, anger, and aggression, and can lead to physical and psychological illness if not addressed. However, individuals react differently to the same situation. In other words, optimal stress levels are beneficial in life, but excessive stress levels can cause many problems **(Alshawi et al., 2018).**

The literature revealed that there were some studies conducted to assess the level of stress among students. Some of these studies measured the level of academic stress among medical students and the other studies measured the level of stress among university students in general. For example, In a study on the prevalence of stress and related stressors conducted among medical students in Malaysia, the results showed a prevalence rate of stress was 33.3% among medical students and academic stress was the highest mean score on the assessed MSSQ (Musiun et al., 2019). A comparative study of stress between public and private medical schools was conducted in Bangladesh and the results confirmed that the prevalence of stress in the study population was 54%. More than half of Bangladeshi medical students experience academic stress (Eva et al., 2015). Another study conducted in Sudan showed that the overall incidence rate of stress was 31.7%. Time pressure, heavy workload, fear of failure, and frequency of exams are the main stress factors (Ragab et al., 2021). A study of predictors of perceived stress among medical and non-medical students was conducted in Egypt. The percentage of medical students who perceive stress (88.9%) is higher than non-medical students (83.5%), and the Academic stressors were found to be a significant predictor of all students (Seedhom et al., 2019). In different study was carried out in Eastern Ethiopia, to determine the prevalence of stress among medical students, the results showed that there was an increase in the prevalence of stress and anxiety among female undergraduate medical students (Asfaw et al., 2021). In 2021, another study conducted at the Indian Medical College used the Perceived Stress Scale (PSS). The results showed that 68% of participants showed signs of moderate stress. Second-year students have higher PSS scores (John and Naik, 2021). In the present study, academic-related stress was having higher mean score compared with other areas, the result of this study agreed with the result of Melaku and Bulcha. (2021) which showed that the ARS domain became the primary contributor to excessive stress. Additionally, the present findings are in line with those of a study by Battula et al. (2020), Bamuhair et al. (2015), Puig Lagunes et al. (2020), Surwase et al. (2016), Seedhom et al. (2019), Amanya et al. (2018), Musiun et al. (2019), Eva et al. (2015), (Ragab et al.(2021), Satpathy et al. (2021), which indicated that academic stressors were the

primary cause of stress. And these findings agrees with the findings of present study. TLRS is a significant stressor that contributes to stress. However, according to the findings of other studies, teaching-learning stressors were ranked in the third position and not the second. For example, Surwase et al. (2016) demonstrated that intrapersonal and interpersonal stressors were in the second rank followed by teaching learning stressors. Furthermore, John and Naik, (2020) found there was a significant association between gender and perceived stress ($p < 0.05$), higher stress was seen among female students, which is inconsistent with the result of this study. Also, according to the finding of Mahyuddin et al. (2018), females experienced more stress (70.1%) than males (29.5%), which is inconsistent with the result of the present study, the prevalence of stress was highest among fourth-year students and lowest among first-year. There was a strong link between study year and stress level ($p > 0.00$), this result agree with the present result that clinical years are more stressful than preclinical years. The present result was consistent with the result of Yasien & Alvi (2018) which showed no gender effect on the degree of stress. From the researcher's viewpoint, based on the researcher job experience at the faculty of medicine and the interactions with medical students, persistent academic stressors, especially heavy curriculum influence on academic achievement and can compromise a student's performance. Medical students mental status can be affected by stress, making it difficult for them to think clearly, that could have long-term consequences when they are under stress. Focusing on the future doctors' mental health is crucial for ensuring the safety and wellbeing of the patients. Curriculum development should be reframing to prevent tension among medical students. Teachers should be give more encouragement and support to help their students and made more conscious of their role as ideal role models, and educational programs must assure simplicity and specificity.

5- Conclusion

Stress is recognized as a global phenomenon affecting all slides of the community. There are several sources of stress affecting medical students. The study aimed to determine the stress levels among medical students in the Gaza Strip. The online self-response questionnaire consisted of participant characteristics, Medical Student Stress Questionnaire (MSSQ-40) used by the researcher for gathering data. Based on the results of this study, the prevalence of stress among medical students was 48.25% and classified as moderate stress. Academic-related problems were the major and the first stressors facing medical students and were rated as high stress, followed by teaching and learning stressors. The level of academic stress among medical students during the years of clinical training was higher than in the pre-clinical training years. Regarding gender variations, no statistical differences were found in terms of stress.

6- Recommendations

To reduce levels of stress among medical students**,** university administrations, lecturers, and decision-makers need to focus on the future doctors' mental health for ensuring the safety and well-being of the patients. Curriculum development should be reframed, stress management training should be an essential component of the curriculum, a positive learning environment, and psychological counseling should be considered. This will help to enhance the resilience of students and improve their academic performance. This study will be a good base for other relevant research activities for medical research interests.

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