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Assessing the level of stress among medical students at the medical college of Um Al Qura University in Al-Qunfudhah

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ABSTRACT

Objective: One of the major problems affecting medical students is the stress that is perceived during their academic studies. This investigation sought to understand the prevalence and sources of stress among medical students at Umm Al-Qura University in the city of Al-Qunfudhah, Saudi Arabia. *Methods*: A cross-sectional study was conducted using a validated 20-item Medical Student Stressor Questionnaire (MSSQ) that was distributed among medical students (Year 2 – 6) to establish the areas of stress. *Results*: This study found that 42.9% of the medical students suffered from moderate stress and 31.7% experienced high to severe levels of stress. The most leading source of stress was academic-related stressors (ARS), with female students exhibiting more stress than male students, a difference that was statistically significant (P = 0.013). *Conclusion*: ARS such as 'Lack of time to review what has been learnt' and 'Heavy workload' were the main reasons that cause psychological stress to medical students. The level of stress decreased incrementally with study progression except for the fifth year. We conclude that ARS are a principal concern in the early years of study for medical students, particularly female students and therefore represent an important area for intervention by student support services.

Keywords: medical students, stress, MSSQ-20, stressors.

1. INTRODUCTION

Stress is a condition or feeling experienced when the demands exceed the social resources the individual is able to mobilize (Salleh, 2008). It can manifest itself in a variety of ways, including emotional manifestations such as anxiety, depression, anger, fatigue, boredom, or apathy (Niemi and Vainiomäki, 2006). Another factor is cognitions, which can manifest as poor focus and memory, impaired organization, or in behaviors such as sleep and eating issues, anger, or even physical symptoms such as headaches, nausea and dizziness (Niemi and Vainiomäki, 2006; Michie, 2002; Sherina et al., 2004).

Medical students are more stressed than other students and population factors include those that are specific to the individual and protect, promote,

or perpetuate stress, Personality traits, coping styles, psychological and physical health and the use of psychoactive substances are examples of 'personal' elements influencing stress. Conversely, the nature of the curriculum (Gazzaz et al., 2018; Chowdhury et al., 2017), living and study environments and funding are all examples of 'environmental' issues (Abdulghani et al., 2011; Hill et al., 2018). Stress levels among medical students have been observed to be high in a variety of countries. Studies in Saudi universities revealed that medical students experience high levels of stress of up to 71%, whereas a study in Iraq found a rate of 77.5% (Abdulghani et al., 2015; Abdel Rahman et al., 2013; Sani et al., 2012; Al Shawi et al., 2018). Furthermore, 54% of medical students in a Bangladeshi medical school reported stress and 57.8% in an Egyptian counterpart reported more psychological stress among female medical students than in males (Eva et al., 2015; Abdallah and Gabr, 2014).

Stress is a natural and beneficial component of life that aids learning. An adequate degree of stress improves learning, but excessive stress can create health problems (Gomathi et al., 2012), with effects seen in many aspects, such as performance and personality. Suicidal thoughts, a poor quality of life, or low academic achievement are all factors to consider (Zeng et al., 2019). Studies show that students' mental health deteriorates when they enter medical school and continues to deteriorate throughout their training (Abdulghani et al., 2015). According to the World Health Organization, the global burden of psychological diseases continues to rise, posing social, human serious social and health risks as well as social and economic ramifications in every country (James et al., 2018).

Given the lack of published studies at Umm Al-Qura University, this investigation was conducted to assess the prevalence and sources of stress among Saudi medical students in a newly founded medical school in Al-Qunfudhah. Furthermore, we sought to establish any other associations between the severity of stress and demographic data such as GPA (Grade Point Average), level of income and year of study, which could potentially provide an opportunity to tackle these stressors at early stage.

2. MATERIAL AND METHODS

Study Design

A cross-sectional study to assess the level of stress among medical students at Um Al-Qura University in Al-Qunfudah from March 2022 to July 2022 was conducted using a 20-item questionnaire (MSSQ-20) and demographic characteristic data such as age, marital and economic status, GPA and housing. The questionnaire was adapted from a previous study done in Malaysia (Yusoff, 2011). The questionnaire was divided into six domains: Academic-related stressors (ARS), interpersonal and intrapersonal-related stressors (IRS), teaching and learning stressors (TLRS), drive and desire-related stressors (DRS), social-related stressors (SRS) and group activities-related stressors (GARS). Our targeted samples were recruited from the second year to the sixth-year study, with 360 total students included in the study. After we got a list of the student's names, respondents were selected from each year using a systemic random sampling technique. Then, we created a WhatsApp group for each year to answer all enquiries and to make sure that they properly understood the questionnaire items. An electronic version of a self-administered questionnaire (Google Forms) was sent to students. The questionnaire contained three parts: A brief description of the research aims, a consent form and an MSSQ-20 questionnaire with fields for the demographic data. Students were asked to answer each question by choosing a number from 0 to 4, indicating the intensity of stress (0 = no stress, 1 = mild stress, 2 = moderate stress, 3 = high stress and 4 = severe stress).

Ethical Approval

This study has been ethically approved by the Scientific Research Ethics Committee at Um Al-Qura University. The following procedures were included in the consent form: Surveys will be conducted anonymously; students will be assured of the confidentiality of their responses and anyone is free to decline to participate in the survey (Approval No HAPO-02-K-012-2021-03-643).

Statistical analysis

All data analysis procedures were performed using the SPSS software package (version 25, IBM Corp., Armonk, NY, United States). The descriptive analysis is presented as frequency, mean and standard deviation. Assumptions of normality in the data were made by visualization of normality plots and the Kolmogorov-Smirnov test. Inferential analyses such as independent *t*-test and one-way ANOVA were used to investigate mean differences in stress levels according to the demographic data. A P value of ≤ 0.05 was considered to be statistically significant.

3. RESULT

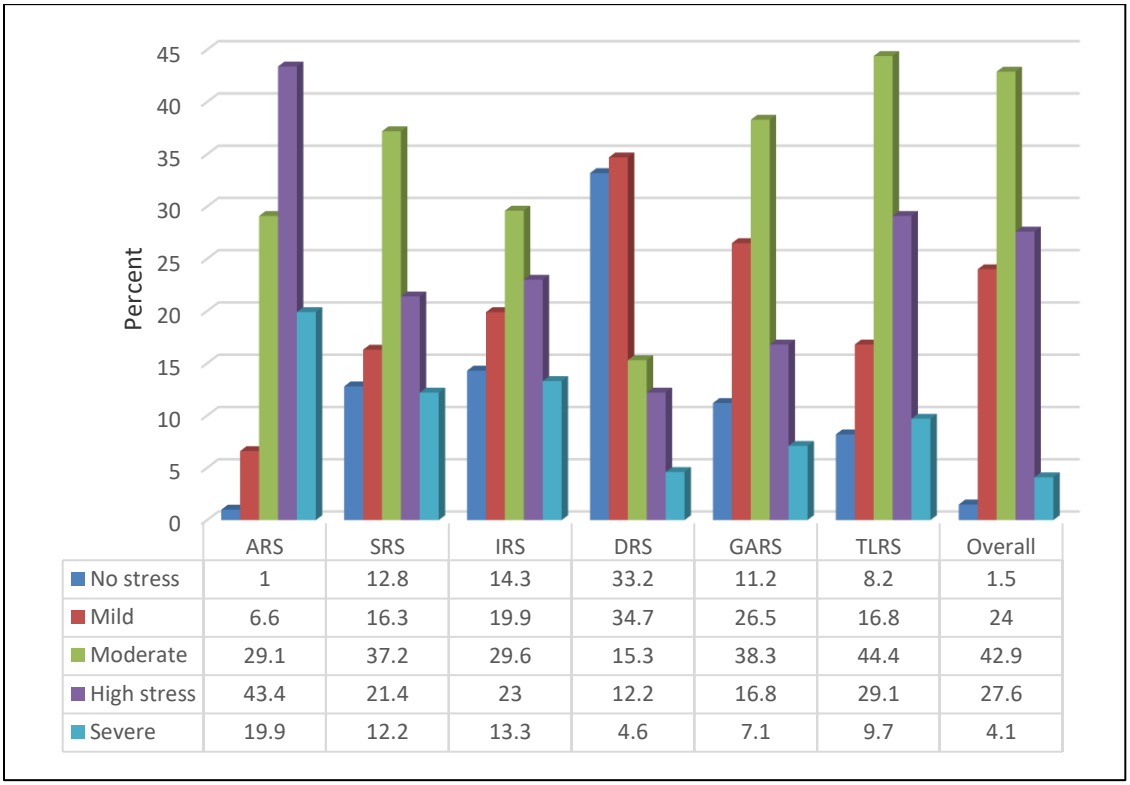
Stress Prevalence

The questionnaire was conducted on 196 students at Um Al Qura University. The average age was 22 ± 1.57 years, the number of females was 105 (53.6%) and male was 91 (46.4%). For the years of study, the largest group was for third year, (n = 44; 22.4%) and most of the students had a GPA between 3.5 - 4 (n = 127; 64.8%). The majority of respondents were unmarried (n = 181; 92.3%) and the income level was good (n = 130; 66.3%). Finally, for housing, most of them were living with their family (n = 183; 93.4%) (Table 1).

Table 1 Socio-demographics characteristics of the respondents

Variable	Options	N (%)	Mean ± SD
Gender	Male	91(46.4 %)	
	Female	105(53.6%)	
Age	18	2(1%)	22 ± 1.57
	19	5(2.6%)	
	20	34(17.3%)	
	21	34(17.3%)	
	22	35(17.9%)	
	23	48(24.5%)	
	24	31(15.8%)	
	25	7(3.6%)	
Year of study	Second year	37(18.9%)	0
	Third year	44(22.4%)	
	Fourth year	43(21.9%)	
	Fifth year	34(17.3%)	
	Sixth year	38(19.4%)	
GPA	less than 2.5	4(2%)	0
	2.50 to 2.99	17(8.7%)	
	3 to 3.49	48(24.5%)	
	3.5 to 4	127(64.8%)	
Marital Status	Divorced	7(3.6%)	0
	Married	8(4.1%)	
	Single	181(92.3%)	
Economic Status	Good	130(66.3%)	0
	Intermediate	59(30.1%)	
	Low	7(3.6%)	
Housing	Alone	11(5.6%)	0
	University compound	2(1%)	
	With family	183(93.4%)	

In this study, the overall stress data showed that 42.9% of the students suffered from moderate stress and 31.7% suffered from high to severe stress. ARS was the leading cause of stress; 63.3% of the students reported it as causing high to severe stress. The second leading cause of stress was IRS, 36% of the students rating it as high to severe stress and about 30% of them reported as moderate stress. TLRS and GARS were mostly reported as mild to moderate at 61.2% and 64.8%, respectively. Lastly, DRS domain was the least one to cause stress with about 33% of pupils said causing no stress and 34.7% of them stated that it caused mild stress (Figure 1).



	ARS	SRS	IRS	DRS	GARS	TLRS	Overall
No stress	1	12.8	14.3	33.2	11.2	8.2	1.5
Mild	6.6	16.3	19.9	34.7	26.5	16.8	24
Moderate	29.1	37.2	29.6	15.3	38.3	44.4	42.9
High stress	43.4	21.4	23	12.2	16.8	29.1	27.6
Severe	19.9	12.2	13.3	4.6	7.1	9.7	4.1

Figure 1 Percentage of stress distribution for MSSQ-20 domains and overall stress

The six top items that were causing high stress are 'inadequate time to review lessons learned', 'Heavy workload', 'Great amount of material to be learned', 'tests/examinations', 'falling behind in reading schedule' and 'verbal or physical abuse by teacher(s)' with a reported mean ranging from 2.42 to 2.62 (Table 3). Four out six of these items are related to academic-related stressors (ARS). The least perceived stressors by students were unwilling to study medicine and parental wish for you to study medicine, with an average mean 1.27 (SD = 1.3) and 1.33 (SD = 1.31), respectively (Table 2).

Table 2 stressors items and its domain based on the mean level of stress perceived by medical students

	Mean	St.d	Level	Rank
Heavy workload	2.62	.95		1
Inadequate time to review lessons learned	2.58	1.06		2
Great amount of material to be learned	2.50	1.1		4
Tests/examinations	2.43	1.1		6
Falling behind in reading schedule	2.42	1.17		7
ARS	2.51	.73	High	(1)
Violence from instructor(d) whether physical or verbal	2.51	1.2		3
Violence from personnel(s) whether physical or verbal	2.12	1.01		9
Conflict with teacher(s)	1.92	1.17		12
Violence from other student(s) whether physical or verbal	1.63	1.35		18
IRS	2.04	.95	High	(2)
Experiencing death or illness of the patients	2.44	1.3		5
Inability to respond to patient's concerns	1.95	1.13		11
Talking to patients about personal problems	1.66	1.09		17
SRS	2.02	.92	High	(3)
Uncertainty of what is required of me	2.15	1.19		8
Lack of appreciation for efforts made	1.99	1.18		10
Not enough feedback from teacher (s)	1.85	1.18		15
TLRS	2.00	.89	High	(4)

Participation in class presentation	1.91	1.2		13
Feeling of incompetence	1.88	1.24		14
Necessary to perform well (imposed by others)	1.83	1.18		16
GARS	1.87	.87	Moderate	(5)
Parental wish for you to study medicine	1.33	1.31		19
Unwillingness to study medicine	1.27	1.3		20
DRS	1.3	1.02	Moderate	(6)
Overall stress	2.05	.64	High	-

Degree of stress: 0.00 1.00 = Mild; 1.01 2.00 = Moderate; 2.01 3.00 = High; 3.01 4.00 = Severe (According to MSSQ)

Table 3 compares the mean of stress between both genders, majority of stress came from female medical students as they reported with a mean of 2.15 (SD .56), whereas males reported moderate stress with a mean of 1.93 (SD = .69). ARS domain was the highest source of stress for male and female students, with a mean of 2.38 (SD = .66) and 2.64 (SD = .77), respectively. Although male students reported IRS as a moderate source of stress with a mean of 1.81 (SD = .83), female students saw it as a high source of stress with a mean of 2.23 (SD = .99). The least source of stress for both genders was the DRS domain.

Table 3 Comparison of the mean and standard deviation between male and female medical students

	Male	Female
Overall stress	1.93 ± .56	2.15 ± .69
ARS	2.38 ± .66	2.64 ± .77
SRS	1.93 ±.95	2.1 ±.88
IRS	1.81 ±.83	2.23 ± .99
DRS	1.23 ± .87	1.36 ± 1.14
GARS	1.82 ±.81	1.91 ± .92
TLRS	1.91 ± .86	2.08 ± .92

Students in the second (M = 2.23, SD = .66) and third year (M = 2.12, SD = .56) had more stress than other peers in higher levels and the year that experienced the least stress was the sixth level, with a mean of 1.88 (SD = .66) (Table 4).

Table 4 Descriptive analysis of the demographic (M± SD) data along with inferential analyses (P-value) against overall stress

Variable	Mean	Std. deviation	T/F	p-value
Gender				
Male	1.93	.69	2.5	.013*
Female	2.15	.56		
GPA				
<2.5	2.8	.58		
2.50 to 2.99	1.98	.57		
3 to3.49	1.95	.58	2.33	.076
3.5 to 4	2.07	.66		
Year of the study				
2nd	2.23	.66		
3rd	2.12	.56		
4th	1.91	.62	2.48	.045*
5th	2.03	.63		
6th	1.88	.66		
Economic status				
Intermediate	2.18	.63	1.65	.1
Good	2.02	.64		

Group Comparisons

Inferential statistics were used to assess mean differences by demographic data and overall stress level (Table 4). Independent *t*-test was applied for the gender and economic status (low status was excluded due to the low number of respondents). It showed a statistically significant difference in the mean between males and females ($P = 0.013$), however, there was no statistically significant difference in the mean between intermediate and good economic classes ($P = 0.100$). One-way ANOVA was applied for other demographic data that contained more than two groups, such as year of study and GPA, which resulted in a significant difference in the mean for the year of study ($P = 0.045$), but no significant difference in the mean for GPA ($P = 0.076$). It also showed that level of stress decreased as the year of study progressed. Post-hoc analysis of the year of the study showed significant differences in the stress levels of students between the second year and fourth years (P Value) and between the second and sixth years (P Value).

4. DISCUSSION

Stress is a normal phenomenon that can affect anyone at any point in time, but when it exceeds a given threshold can cause major problems, such anxiety and depression (Gomathi et al., 2012). Medical students are more prone to stress than peers in other fields due to the heavy curriculum that needs to be completed within a short time. In this research, 74.6% of the students were suffering from moderate to severe stress. This result is consistent with previous work conducted in Jizan, which revealed a stress prevalence of 71.9% (Sani et al., 2012). Two further studies performed in other regions in Saudi showed a slight difference in findings, one conducted at King Faisal University and the other at King Saud University reported a prevalence of 53% and 60.3%, respectively (Abdel Rahman et al., 2013; Abdulghani et al., 2011). This discrepancy in findings might be related to the instrument that was used, different curriculum or different system.

In our study, 110 students out of 125 (90%) graded GPA more than 3 out of 4, which indicated that the majority of the students were very good academically. Seeking excellence in medicine can cause more stress (Noriah et al., 2013) and that appeared to be evident in our finding that academic-related stressors (ARS) were the highest source of stress among medical students with a mean of 2.51 (SD = .73). This finding is similar to other studies conducted at different institutions (Al Shawi et al., 2018; Eva et al., 2015). Likewise, the results showed that IRS were secondary to ARS with a mean of 2.04 (SD = .95) which indicated as high stress. However, inferential statistics revealed no significant differences in the mean between GPA and overall stressors. This finding matches another study conducted at King Saud University, Riyadh, Saudi Arabia. They found no association between the academic grades and level of stress with a P-Value (0.31) (Abdulghani et al., 2011).

The majority of items causing high stress came from the ARS domain. 'Heavy workload' and 'inadequate time to review lessons learned' are the main reasons that led to stress in most medical colleges because students perceived a large amount of information within a short time and they are required to review it within a short period as well. There were similar findings in other studies from Bulgaria and Malaysia that revealed heavy workload and inadequate time to review lessons learned as significant areas for stress among medical students (Noriah et al., 2013; Georgieva et al., 2014). These data indicate that studying medicine causes high stress due to the great amount of material, short time to review lessons learned and regular exams throughout the year. In order to tackle these problems, college principals should review the curriculum and attempt to minimize unnecessary subjects and at the same time students should learn how to manage their time properly. Unwillingness to study medicine and Parental wish for you to study medicine (both DRS-related domains) were the factors causing stress the least with a mean of 1.30 for both, which suggests that they have a minimal influence on students' stress.

In the present study, female students suffered from stress more than their male counterparts. Being female is considered one of the risk factors for stress, as many studies have confirmed that female medical students have a higher stress levels compared to their male colleagues (Abdulghani et al., 2011; Sani et al., 2012; Georgieva et al., 2014). Stress level decrease with the progression of the year of study, except for the fifth year which had the most stress in clinical years. The underlying reason for this is related to the great amount of material at this point and students at this year have a heavier curriculum than other clinical years. The second year was the most stressful level throughout the whole study period. It is the first year when medical students start to study basic medical subjects and this might be the reason as to why it was the most stressful year.

Limitations

As this study was run among medical students at Um Al-Qura University, Al Qunfudhah city branch, another study should be done to cover the main campus to generalize the finding on whole population of medical students at Um Al-Qura University.

5. CONCLUSION

This study found that the majority of medical students are suffering from moderate to severe stress. Most stress came from ARS such as heavy workload and inadequate time to review lessons learned as well as maltreatment from instructors, whether physical or verbal (s), which is related to IRS stressors, also contributed to this stress. Female students showed that they experienced more stress than male students. Stress decreased with the progression of academic study, except for the fifth year. This might be because of the large content of the curriculum in fifth year compared to other years. Our findings suggest that the early years of study, particularly in female medical students, represent an area for potential intervention by student support services.

Abbreviations

MSSQ-20 = Medical Student Stressor Questionnaire 20 items

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Authors' contributions

SMA: Conceptualized, analyzed the data, edit the manuscript, reviewed and proofed the study.
ZAA: Collected and organized the data, edit the manuscript, submitted the article on the journal website.
SOA: Collected and organized the data, edit the manuscript.

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Conflict of interest

The authors declare that there is no conflict of interests.

Data and materials availability

All data sets collected during this study are available upon reasonable request from the corresponding author.

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