

## Research Article

# The Correlation between Stress Levels among Undergraduate Medical Students and Their Motivation for Studying Medicine

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*Objective.* This study aimed to investigate the relationship between undergraduate medical students' motivations to study medicine and their stress levels in Saudi Arabia. This relationship has not previously been investigated in depth but is urgently required to help improve the academic performance of such students and protect them from academic burnout. *Method.* A questionnaire was created and shared on the official social media platforms of the Faculty of Medicine, Umm Alqura University, Makkah City, Saudi Arabia. A total of 572 students currently studying for a bachelor's degree in medicine were recruited. Cross tabulation to determine the distribution of students' stress levels in relation to their personal data and motivation to study medicine was conducted, using a Pearson chi-square test to assess significance. *Results.* A significant ( $P = 0.049$ ) relationship between two types of motivation among undergraduate medical students and their levels of stress was found. Students driven by intrinsic motivation had lower levels of stress than their colleagues and counterparts, whereas extrinsic motivation resulted in increased levels of stress. Furthermore, older female students and those in the advanced stages of their studies (years 4 and 5) were more likely to be stressed. *Conclusion.* Stress levels among undergraduate medical students were found to correlate with their motivation to study medicine. Intrinsic motivation needs to be promoted, which would help students view their accomplishments more positively and help protect them from burnout.

## 1. Introduction

Mental health is a key component of health. Medical students face high levels of stress due to the high demands of their academic studies, which often affect other aspects of their lives, and which then further compound their stress levels in terms of their academic studies [1, 2].

Academic motivation has been defined as comprising a set of psychological factors that drive students' desire to learn and effectively deal with environmental factors to achieve their goals [3]. Academic motivation can be classified into two types of motivation, namely, intrinsic and extrinsic motivation. For medical students, intrinsic motivation refers to the personal intellectual satisfaction or interest that comes from learning personal skills and knowledge as well as the social satisfaction that comes when taking care of patients and collaborating with other doctors and healthcare professionals. However, an intrinsic

motivation for studying medicine may not always stem from a complete understanding of the medical profession and its demands. For example, it may be derived from unrealistic expectations based on popular medical television programs [4–6]. Extrinsic motivation refers to external factors that attract students, for example, the social advantages associated with studying medicine such as a highly paid and sought-after career, job security, and high prestige. These extrinsic motivations in relation to studying medicine have been found to play a major role in Australia and many other Western countries, where becoming a physician is seen as a good career choice for people who want to improve their social status [5, 7, 8].

Medical students' motivations for studying medicine can involve a multitude of factors in terms of their learning at medical school [3, 5, 8]. These factors affect students' motivation to learn [3] and are likely to be closely related to their academic performance and their stress level

management. Motivation, academic performance, and stress level management among such students are key areas of investigation because medical students are expected to graduate with the skills necessary to provide care for patients and a commitment to continuous learning of skills and knowledge throughout their lives. Previous studies have reported an association between academic performance and motivation, with students with an intrinsic motivation to learn having a high level of academic performance [9, 10]. Moreover, several studies have found that a constant high level of academic stress was also a risk factor for poor academic performance and burnout among students [11–13]. These previous studies indicate that motivation plays a critical role in academic performance and that academic performance can be affected by academic stress. Therefore, it was hypothesized in this study that the severity of medical students' stress levels would be associated with their motivations for studying at medical school. It was assumed that either an intrinsic or extrinsic motivation for studying medicine or both might have a critical role in having high or low stress levels. Understanding the relationship between students' motivations for studying medicine and the severity of stress students face might help in improving students' academic performance and protect them from burn out. Few studies have examined the relationship between the motivation for studying medicine and the severity of academic stress, especially in Saudi Arabia. Therefore, this study aimed to explore the relationship between the motivation for studying medicine and the severity of stress levels among undergraduate medical students in Saudi Arabia.

## 2. Materials and Methods

**2.1. Study Design and Population.** This descriptive cross-sectional study was performed using an online questionnaire from August 22, 2020, to September 6, 2020. The target population comprised undergraduate medical students who were studying on the Bachelor of Medicine and Bachelor of Surgery (MBBS) program at the Faculty of Medicine, Umm Alqura University (MedUQU), Makkah City, Saudi Arabia. Participation in this study was voluntary and recruitment was carried out through official social media and emails, with the questionnaire link being circulated to all undergraduate medical students at the MedUQU faculty via Twitter, Snapchat, and WhatsApp groups. The first page of the survey outlined the purpose of the study, the estimated completion time, and provided an informed consent form for participation. The final total number of participants for the current study was 572 medical students.

**2.2. Questionnaire Structure.** An online modified questionnaire was designed using Google Forms. This modified questionnaire was modelled on those from previously published studies [8, 14] and was approved by the Biomedical Ethics Committee of the Faculty of Medicine, Umm Alqura University (Approval number: HAPO-02-K-012-2020-08-430). The questionnaire consisted of 14 items in two sections. The first section sought general information

concerning the participants, such as gender, age, year of study, and motivation to study medicine. The second section used the Kessler Psychological Distress Scale (K10) to assess the stress levels in the medical students [15]. It involved ten questions concerning the students' emotional states, with responses provided on a 5-point scale ranging from 1 ("none of the time") to 5 ("all of the time").

**2.3. Data Analysis.** The data were collected, reviewed, and then entered into Statistical Package for Social Sciences (SPSS) version 21 software. All statistical methods used were two-tailed with an alpha level of 0.05 considered as significant with a *P* value less than or equal to 0.05. In terms of the K10 scores, the scores from the ten items were summed, yielding a minimum score of 10 and a maximum score of 50. Low scores indicated low levels of psychological distress, and high scores indicated high levels of psychological distress. The students' stress levels were categorized as follows: (10–19, likely to be well), (20–24, likely to have a mild disorder), (25–29, likely to have a moderate disorder), and (30–50, likely to have a severe disorder). Descriptive analysis was performed using frequency distribution and percentage for the study variables, including the students' personal data, motivations to study medicine, and the K10 distress item distribution. Cross tabulation to show the distribution of the students' stress levels in relation to their personal data and their motivation to study medicine was carried out using a Pearson chi-square test to determine significance.

## 3. Results

The study included 572 medical students whose ages ranged from 18 to 25 years, with a mean age of  $19.6 \pm 3.4$  years. Of these, 298 (52.1%) students were female, and 274 (47.9%) were male. Concerning the academic year, 206 (36%) students were in their 2<sup>nd</sup> year, 141 (24.7%) were in their 3<sup>rd</sup> year, 168 (29.4%) were in their 4<sup>th</sup> year, and 57 (10%) were in their 5<sup>th</sup> year (Table 1).

Table 2 illustrates the motivations of these Saudi Arabian medical students to study medicine. The most commonly reported motive was their own interest (77.1%,  $n = 441$ ), followed by their desire to earn money (32.3%,  $n = 185$ ), lack of other plans or choices (31.6%,  $n = 181$ ), being influenced by family (30.6%,  $n = 175$ ), and showing up (5.8%,  $n = 33$ ). A further 13 (2.3%) students reported other factors, some of which included helping people.

An analysis using the K10 scale found that 98.6% of the medical students felt anxious to varying degrees, 94.8% felt exhausted for no good or valid reason, 93.7% felt that everything was an effort, 90.4% felt restless or fidgety, 88.3% felt depressed, 81.5% felt so sad that nothing could cheer them up, and 68.7% felt worthless to some degree (details about the Kessler 10 Psychological Distress (k10) frequency distribution among sampled medical students are illustrated in Table 1 in the Supplementary Materials).

Figure 1 shows the overall stress levels among the medical students. In total, 100 (17.5%) students had no stress. Mild stress was detected in 108 (18.9%) students, 98

TABLE 1: Personal data of the medical students.

Personal data	No.	%
Age in years		
18–21	411	71.9
22–25	161	28.1
Gender		
Male	274	47.9
Female	298	52.1
Academic year		
2nd year	206	36.0
3rd year	141	24.7
4th year	168	29.4
5th year	57	10.0

TABLE 2: Motivations to study medicine among the medical students.

What is your motivation to study medicine?	No.	%
Interest	441	77.1
Earning money	185	32.3
No other plans or choices	181	31.6
Influenced by family	175	30.6
Show up	33	5.8

(17.1%) had moderate stress, and 266 (46.5%) showed severe stress levels. The stress scores ranged from 10 to 50, with a mean score of  $29.1 \pm 9.3$ .

Table 3 shows the distribution of the medical students' stress levels based on their personal data. A total of 54.7% of the students aged 22–25 years had severe stress levels in comparison to 43.3% of those aged less than 22 years, which was statistically significantly different ( $P = 0.027$ ). In addition, severe stress was detected in 60.7% of the female students compared to 31% of the male students ( $P = 0.001$ ). The academic year was not significantly related to the students' stress levels ( $P = 0.401$ ).

Table 4 shows the distribution of the medical students' stress levels in terms of their motivation to study medicine. The highest stress level was detected among those who studied to show up among whom 57.6% were severely stressed, followed by those who sought money (49.7%), and those with no other choice (49.2%), while the least stressed students were those who were interested in studying medicine (45.6%).

These findings indicate that there was a clear relationship between the medical students' motivations for studying at medical school and their stress levels.

#### 4. Discussion

This study found a clear association between motivation and stress levels among the participating undergraduate medical students. Specifically, intrinsic motivation in relation to their subject, that is, having a genuine interest in medicine, resulted in lower levels of stress among these students. Furthermore, those students who were motivated to study medicine (the highest percentage at 77.1%) were more likely to persevere in their studies. Those who were extrinsically motivated, for example, those who were studying medicine

for prospective financial gain and those who were there for status reasons (showed up), reported severe stress levels and were approximately only half as motivated to study medicine as their counterparts who were intrinsically motivated and, therefore, were more prone to burnout. Students who reported other reasons for studying, such as wanting to help people, reported similar levels of severe stress to those who were genuinely interested in studying medicine. Approximately, 31.6% reported that they had no other choice and plans but to study medicine, and they reported higher severe stress levels compared to those who were intrinsically motivated, but with approximately equal levels to those who were extrinsically motivated. These findings accord with those of Sharififard et al., who concluded that intrinsic motivation could protect students against academic burnout [5].

A total of 30.6% of those motivated to study medicine did so because of family influence, which was less than half of those who were intrinsically motivated to study medicine. A higher percentage of these students also reported severe stress (48.6% compared to 45.6% of those who were intrinsically interested). This finding accords with that of previous studies where it has been found that one of the highest causes of stress was expectations from family or family influence [11] and that Pakistani students who reported stress stemming from parental expectations were unable to perform efficiently during classes and clinical practice to have various disorders caused by stress and to have declining performance [12].

Older female students were also more likely to be stressed compared to men. This finding supports that of a previous study where it was found that students in their advanced years of study also reported high levels of stress and that older female students within this group reported even higher stress levels and were more prone to declining academic performance [2].

Moreover, the results of this study also showed that medical students in general reported high levels of severe stress, which also supports the findings of Moir et al. [16]. This finding indicates that such students may bear considerable costs in relation to their health, the possible adoption of unhealthy coping strategies, quicker academic burnout, and less resilience in the face of academic demands, which supports the findings of Abouammah et al. [17]. Both faculty members and students should take steps to minimise stress. Students can be protected against academic burnout through promoting their intrinsic academic motivation, pinpointing, and applying the relevant life/work management skills and through acknowledging the factors affecting stress, motivation, self-efficacy, and academic performance.

#### 5. Limitations

This study had several limitations. First, selection bias could not be completely eliminated. Selection bias is likely when people volunteer for a study. In this case, for example, those medical students who were more stressed may have been more likely to participate, which could have narrowed the scope of the opinions that were shared in the study and

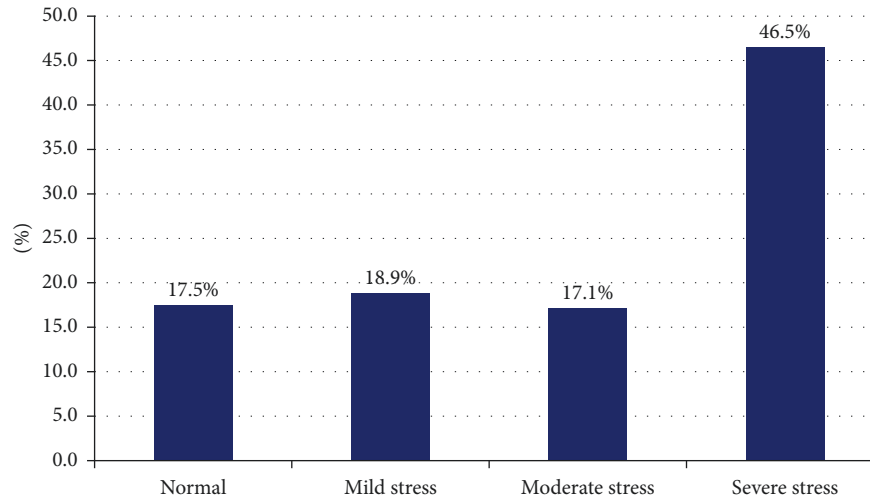


FIGURE 1: Overall stress levels among medical students.

TABLE 3: Distribution of medical students' stress levels in terms of personal data.

Personal data	Stress level						P value
	Normal		Mild to moderate stress		Severe stress		
	No.	%	No.	%	No.	%	
Age in years							
18–21	72	17.5	161	39.2	178	43.3	0.027*
22–25	28	17.4	45	28.0	88	54.7	
Gender							
Male	67	24.5	122	44.5	85	31.0	0.001*
Female	33	11.1	84	28.2	181	60.7	
Academic year							
Preclinical years	65	18.7	128	36.9	154	44.4	0.401
Clinical years	35	15.6	78	34.7	112	49.8	

P: Pearson  $X^2$  test; \*  $P < 0.05$  (significant).

TABLE 4: Distribution of medical students' stress levels in terms of motivation to study medicine.

What is your motivation to study medicine?	Stress level						P value
	Normal		Mild to moderate stress		Severe stress		
	No.	%	No.	%	No.	%	
Interested	80	18.1	160	36.3	201	45.6	0.049*
Influenced by family	20	11.4	70	40.0	85	48.6	
No other plans or choices	25	13.8	67	37.0	89	49.2	
Show up	3	9.1	11	33.3	19	57.6	
Earning money	24	13.0	69	37.3	92	49.7	
Other reasons	3	23.1	4	30.8	6	46.2	

P: Pearson  $X^2$  test; \*  $P < 0.05$  (significant).

affected the results. Second, it cannot be ruled out that stress levels were affected in terms of the academic year, for example, it is possible that the advanced students who had learned to overcome their stress may have downplayed their former or current experiences of stress or that their motivations had changed over time, which would have affected their stress levels.

## 6. Conclusions

The medical profession is a highly competitive and admired profession that demands much from those studying to join it. This study found a clear association between the stress levels among undergraduate medical students and their motivation to study medicine. Medical students face

considerable stress that is potentially harmful to both themselves and to society in terms of potential responses to that stress involving maladaptive stress coping mechanisms, personal and academic burnout, and decreased resilience. Females between the ages of 22–25 were found to be more prone to stress and academic burnout. Therefore, educational authorities in universities need to be aware of potential stressors and help students address them effectively. Other options that universities might usefully consider could include offering counselling services free of charge to students and to include stress-management courses for students as part of their overall curriculum. This study also indicates that efforts might need to be focused on increasing intrinsic motivation to help students see their accomplishments more positively and help protect them from burnout.

### Data Availability

The original contributions presented in the study are included in the article, further inquiries can be directed to the author.

### Conflicts of Interest

The author declares that there are no conflicts of interest.

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### Supplementary Materials

Table 1: Kessler 10 Psychological Distress (K10) frequency distribution among sampled medical students, Saudi Arabia. (*Supplementary Materials*)

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