**Original Article :**

# Prevalence of stress among students of the College of Medicine, Majmaah University, Saudi Arabia, 2019-20.

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## Abstract

**Background and Aims:**

Stress is the body's response to any intrinsic or extrinsic factor that stimulates biological response. Cognitive abilities such as learning and memory are affected by levels of stress. This research aimed to study the prevalence of stress among students of the college of medicine, Majmaah University, Saudi Arabia, and determine the relationship between stress and social factors, academic performance, and lifestyle.

**Methods:**

This cross-sectional study was carried out between May 2019 and October 2020. Simple random sampling was used and the sample size was 230. A pre-tested questionnaire was used to collect the data. Descriptive studies were done by Pearson Chi-square and Fisher Exact tests. All data were tabulated and analyzed using the IBM SPSS version 24 program.

**Results:**

Students with low, moderate, and severe stress were 9 (3.9%), 176 (76.5%), and 45 (19.6%) respectively. 24 (14.8%) and 21 (30.9%) of male and female students had a severe level of stress (p=0.02). The students in the pre-clinical phase had more levels of stress than the students in the clinical phase of their study (21.4% vs 13.5%, p=0.002)

**Conclusion:**
the majority of students at the College of Medicine, Majmaah University have moderate stress. The level of stress is related to gender; female students have a more severe level of stress than male students. Severe stress is more prevalent in pre-clinical students compared to students in the clinical phase of the study. The study shows no relationship between stress and the academic performance of the students.

**Keywords:**
Stress, Psychological impact, medical students, Saudi Arabia.

## Introduction

Stress is the body's response to any intrinsic or extrinsic factor that stimulates biological response. Cognitive abilities such as learning and memory are affected by levels of stress. Stress in medical students is a common health concern. The health status of medical students is an issue that drew the attention of researchers worldwide in the last decades. It was found that the mental health status of medical students is poorer compared to the other sectors of the community and age-matched peers[1,2,3]. Stress is an important cause of declining empathy among medical students[4,5]. Heavy exercises, compulsory attendance and lack of time to spend in rest and luxury also contribute to the problem[6]. Examination burden and desire to score high marks in the exams also exerted a psychological burden on medical students leading to stress, anxiety, and depression[7]. This situation increases medical students' psychological distress and thus become vulnerable to psychological problems such as insomnia, anxiety, depression, diet irregularities along with subjection to substance abuse and drug addiction[7,8]. A study conducted in the USA found that 11.2% and 68.6% of the medical students had severe and very severe stress that interfere with their lives[9]. Studies in India, Bangladesh, Ethiopia, and Egypt discovered that stress prevalence among students that were in the medical field was 68%, 54%, 23%, and 30.9% respectively[10,11,12,13,14]. A study on first-year medical students of the Gulf Medical University (GMU) in Ajman concluded that the prevalence of psychological stress was found to be 33.6%[7].

In Saudi Arabia, stress prevalence among students in the medical field is high; studies conducted in different universities in the Kingdom found that the prevalence of stress ranged between 28.9 and 71.9%[7], [13, 15, 16, 17,18,19]. A study conducted to determine the level of stress among college of medicine students at Majmaah University found that 46.7%, 37.1%, and 4.8% of students had mild, moderate, and severe stress re-

spectively[20]. Another study found that the prevalence of mental distress was 35.8%[21]. Stress among Majmaah medical students is associated with depression, more than half of students experienced stress and insomnia comorbidity[22]. This research aimed to study the prevalence of stress, identify the relationship between stress, social factors, and lifestyle; and determine the effect of stress on academic performance among the students of the College of Medicine, Majmaah University, Saudi Arabia.

## Materials and methods

*Study Design:*

This is a cross-sectional study that was conducted to study the prevalence of stress among college of medicine students at Majmaah University, Al-Majmaah, Saudi Arabia.

*Study duration:*

The data collection was performed between 21/10/2019 and 1/5/2020.

*Ethical concern:*

We obtained informed consent from the participants and ethics approval was obtained from Majmaah University IRB (MUREC-Des. 10/COM-2019/13-2). Permission and coordination were obtained from the administration of the college.

*Study Population:*

The study population was College of Medicine, Majmaah university undergraduate students. Population, which includes males and females, is confined to registered and regular students only; external students were excluded from the study. A total of 236 students participated, 6 of which were excluded as they failed to complete the survey.

*Setting:*

The study was conducted in the College of Medicine, Majmaah University, Al-Majmaah

which is located in the Sudhir area in the Riyadh region of Saudi Arabia.

*Sampling:*

Stratified random sampling was used to select the students as pre-clinical or clinical. At the level of the select phase, students were chosen by simple random sampling. The sample size was calculated according to the following Formula:

($n=Z^{2*}pq/d^2$), where Z= Standard normal deviation = 1.96, p= Prevalence = 0.82[9], Q= 1-p= 0.18, d= Accepted error = 0.05, n= 2*2*0.82*0.18/0.05*0.05= 236.

*Data collection:*

A pre-tested questionnaire was used to collect the Data. The questionnaire assesses the level of stress among the students of the college of medicine, Majmaah University. The questionnaire was introduced at the end of a lecture and the students were

given 10 minutes to fill out the questionnaire. The content validity of the questionnaire was assessed. Each item was assessed based on representativeness and relevance. Content Validity Indices (CVIs) were calculated and items with CVIs less than 0.85 were revised and corrected.

The questionnaire contained two sections. The first section was about socio-demographic characteristics, academic information, and the lifestyle of the subjects. Section B contains questions related to stress. A widely used 10-item perceived stress scale (PSS-10) was used to assess the level of stress33. The range of total scores was as follows: 0-13 low stress. 14 to 26 moderate stress, 27 to 40 severe stress. Cumulative Grade Point Average (CGPA) was used to assess academic performance. Students who had less than 3.5 were considered to have low academic performance, and students who acquired CGPA of 3.5 to 5.0 were considered to have a high academic performance.

*Data analysis:*

Descriptive studies were done by Pearson Chi-square and Fisher Exact tests. A p-value of <0.05 was considered statistically significant. All data were tabulated and analyzed using the IBM SPSS version 24 program.

## Results

Table 1 shows the demographic characteristics of the participants. One hundred and forty-six (63.6%) of the students were between 19 and 22 years old, while 84 (36.5%) were between 23 and 27 years old. Male students were 162 (70.4%) while female students were 68 (29.6%). Most of the students lived in Al-Majmaah city (n=135, 58.7%). Most of the participants were single (n=222, 96.5%) while married students were 8 (3.5%). The majority of the students were living with their families (n=144, 62.6%), followed by those living alone (n=54, 23.5%), and students living with friends (n=24, 10.4%). The fathers of most of the students were employees (n=126, 54.8%), followed by business (n=48, 20.9%). The education level of 109 students' fathers was College and post-college (n=109, 47.4%), general education was (n=101, 43.9%) while fathers without education were (n=20, 8.7%).

Table 1: Sociodemographic characteristics of the students (n=230)

| Demographic characteristics | Frequency | Percent |
|---|---|---|
| Age | | |
| 19-22 | 146 | 63.6 |
| 23-27 | 84 | 36.5 |
| Marital status | | |
| Single | 222 | 96.5 |
| Married | 8 | 3.5 |
| Gender | | |
| Male | 162 | 70.4 |
| Female | 68 | 29.6 |

| Demographic characteristics | Frequency | Percent |
|---|---|---|
| Residence: | | |
| In Majmaah | 135 | 58.7 |
| Out of Majmaah | 95 | 41.3 |
| Live with whom: | | |
| Family | 144 | 62.6 |
| Alone | 54 | 23.5 |
| Friends | 24 | 10.4 |
| Others | 8 | 3.5 |
| Father occupation | | |
| Employee | 126 | 54.8 |
| Business | 48 | 20.9 |
| Worker | 12 | 5.2 |
| Retired | 33 | 14.3 |
| Other | 11 | 4.8 |
| Father education: | | |
| No education | 20 | 8.7 |
| General | 101 | 43.9 |
| College and post college | 109 | 47.4 |

Figure 1: Shows the results of the perceived stress scale-10. The students who had low stress were 9 (3.9%). Students who had moderate and severe stress were 176 (76.5%) and 45 (19.6%) respectively.

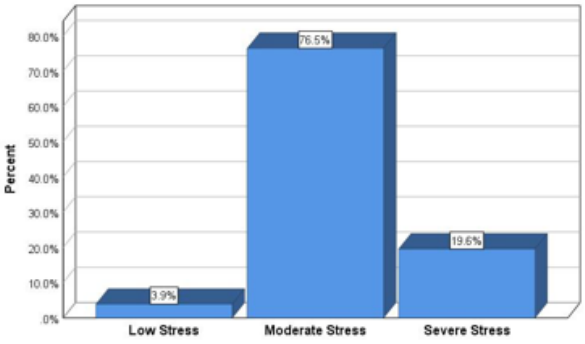



Fig1: Students Level of Stress

Table 2: Association between stress and sociodemographic characteristics

| Variable | Stress | | Total | p |
|---|---|---|---|---|
| | Low/ Moderate | Severe | | |
| | n (%) | n (%) | | |
| Gender: | | | | |
| Males | 138 (85.2) | 24 (14.8) | 162 (100) | 0.02 |
| Females | 47 (69.1) | 21 (30.9) | 68 (100) | |
| Residence: | | | | |
| In Majmaah | 111(82.2) | 24 (17.8) | 135 (100) | 0.721 |
| Out Majmaah | 74 (77.9) | 21 (22.1) | 95 (100) | |
| Marital status: | | | | |
| Single | 179 (80.7) | 43 (19.4) | 222 (100) | |
| Married | 6 (75.0) | 2 (25.0) | 8 (100) | 0.759 |
| Living with: | | | | |
| Family | 113 (78.5) | 31 (21.5) | 144 (100) | 0.754 |
| Not with family | 72 (79.2) | 14 (20.8) | 86(100) | |
| Father's occupation: | | | | |
| Business | 39 (81.3) | 9 (18.7) | 48 (100) | |
| Employee | 98 (77.8) | 28 (22.2) | 126 (100) | 0.714 |
| Other | 48 (85.7) | 8 (14.3) | 56 (100) | |
| Father's education: | | | | |
| No education | 17 (85) | 3 (15) | 20 (100) | |
| General | 78 (77.3) | 23 (22.7) | 101 (100) | 0.699 |
| College/post | 90 (82.6) | 19 (17.4) | 109 (100) | |

Twenty-four (14.8%) of the male students had severe stress compared to 21 (30.9%) of the female students (p=0.020). Twenty-four (17.8%) of the students who live in Majmaah city had severe stress while (22.1%) of the students who live outside the city had severe stress (p=0.721). Forty-three (19.4%) of single students had severe stress compared to 2 (25.0%) of the married (p=0.759). Thirty-one (21.5%) of students who live with family had severe stress while 14 (20.8%) who are not living with family had severe stress (p=0.754). Nine (18.7%) of students whose father is working in business had severe stress compared to 28 (22.2%) and 8 (14.3%) of the students whose father is working as employees or other business respectively (p=0.714). Three (15.0%) of students whose fathers are not educated had severe stress compared to 23 (22.7%) and 19 (17.4%) of the students whose fathers' education in general and college/post-college respectively (p=0.699).

Table 3: Association between stress and academic performance

| Variable | Low | Moderate | Severe | Total | p |
|---|---|---|---|---|---|
| | n (%) | n (%) | n (%) | | |
| Academic year | | | | | |
| Pre-clinical | 4 (2.2) | 136 (76.4) | 38 (21.4) | 178 (100.0) | 0.002 |
| Clinical | 5 (9.6) | 40 (76.9) | 7 (13.5) | 52 (100.0) | |
| Total | 9 (3.9) | 176 (76.5) | 45 (19.6) | 230 (100.0) | |
| Academic performance | | | | | |
| Low (Below 3.5) | 2 (3.2) | 48 (77.4) | 12 (19.4) | 62 (100.0) | 0.945 |
| High (3.5 to 5.0) | 7 (4.2) | 128 (76.2) | 33 (19.6) | 168 (100.0) | |
| Total | 9 (3.9) | 176 (76.5) | 45 (19.6) | 230 (100.0) | |

Thirty-eight (21.4%), 136 (76.4%), and 4 (2.2%) of the pre-clinical students have severe, moderate, and low levels of stress respectively. Seven (1.35%), 40 (76.9%), and 5 (9.6%) of the clinical students had severe, moderate, and low levels of stress respectively (p=0.002). Twelve (19.4%), 48 (77.4%), and 2 (3.2%) of the students with low academic performance had severe, moderate, and low levels of stress compared to 33 (19.6%), 128 (76.2%), and 7 (4.2%) of the students with high academic performance (p=0.945).

Table (4) shows the association between the level of stress and quality of life.

Table 4: Association between the level of stress and quality of life

| Variable | Stress | | Total | p value |
|---|---|---|---|---|
| | Low / Moderate | Severe | | |
| | n (%) | n (%) | | |
| Transport: | | | | |
| Own car | 126 (83.4) | 25 (16.6) | 151 (100) | 0.307 |
| Other | 59 (74.7) | 20 (25.3) | 79 (100) | |
| Number of meals: | | | | |
| Three | 71 (79.8) | 18 (20.2) | 89 (100) | 0.875 |
| One -two | 114 (80.9) | 27 (19.1) | 141 (100) | |
| Sleeping hours: | | | | |
| Six and more | 105 (80.2) | 26(19.8) | 131 (100) | 0.487 |
| Less than 6 | 80 (80.8) | 19 (19.2) | 99 (100) | |
| Physical exercise: | | | | |
| Adequate | 53 (78.5) | 9 (21.5) | 62 (100) | 0.283 |
| Inadequate | 132 (79.2) | 36 (20.8) | 168 (100) | |

Twenty-five (16.6%) of the students with severe stress had their cars for transport to the college compared to 20 (25.3%) of the students who don't own cars (p= 0.307). Eighteen (20.2%) of the students who had severe stress eat three meals every day while 27 (19.1%) of the students who eat one to two meals per day suffer from severe stress (p= 0.875). Twenty-six (19.8%) of students who sleep six hours and more had severe stress and 19 (19.2%) of the students who slept for less than 6 hours had severe stress (p=0.487). Nine (21.5%) Students who did adequate exercise had severe stress compared to 36 (20.8%) of the students who had inadequate exercise (p=0.283).

## Discussion

Out of the 230 students who participated in this study, 96.1% of them had moderate and severe levels of stress combined. This result is extremely high which is higher than other studies conducted among medical students in England 31.2%, India 83.7%, and Bangladesh 54%23,24,11. Studies conducted among medical students in Saudi Arabia showed a total prevalence of stress as 71.9%, 82.0%, 71.7%, and 53% respectively[7,9,18,19].

This study's results are inconsistent with studies conducted on students in Saudi Arabia that showed less prevalence of stress[25,26]. Studies conducted on medical undergraduates at the College of Medicine, Majmaah University, found the prevalence of stress as 88.6% and 35.8%, which is lower than this study's prevalence of 96.1%20, [21]. Our finding is higher than the findings of Zareena S et al in India who found that 51%, 8%, and 3% of students were having mild, moderate, and severe stress respectively[10]. The severity of stress is also higher than that reported by Al Sunni A et al in Dammam, Saudi Arabia who found that the students with moderate and severe stress were 31.7%, 18.30%, and 19.6% respectively18. This study's severity of stress is lower than what is reported in a study that was done at King Saud bin Abdulaziz University for Health Sciences in Saudi Arabia, which showed a severe prevalence of stress at 53%[15].

This high prevalence of severe stress in this study may be due to the fact that the syllabus is Crowded and demanding, with huge daily activities and tasks along with multiple exams and quizzes to conduct in a short period expecting the student to perform well, which might result in a high-stress academic life. Other researchers explained the high rates of severe stress to the high frequency of exams, academic workload, and difficulties in time management [7,26]. Other factors include the fact that most medical students were at the top of their class at their schools and after competing with their peers at medical schools they started losing that position. Another stressor that some students reported is that they feel a sense of guilt if they did not spend their free time studying6. One study showed a significant association between psychiatric conditions and stress in which a positive history of a psychological condition increased the likelihood of having stress [16]. On the other hand, students who had close friends to share with them their concerns were less likely to develop stress[19].

In this study, a significant association was found between stress and gender, the level of severe stress among females and males was 30.9% and 14.8% respectively, p=0.02. the findings show concordance with other studies conducted elsewhere[7,11,27]. Our finding contradicts other studies conducted in a private college in Jeddah, and at Majmaah University which showed that males showed more perceived stress than females[17, 21]. Another study showed no significant difference in the mean stress scores of males and female students[18]. Our findings do not find a significant association between stress and the other sociodemographic characteristics ($p \geq 0.05$).

This study's results showed that 21.4% of the students in the pre-clinical phase had severe levels of stress compared to 13.5% among the ones in the clinical phase of their study (p=0.002). This finding is consistent with studies conducted elsewhere[26,18,28]. the results are also inconsistent with other studies[11,14,20]. This study showed that severe stress was highest in the second year (14, 22.7%) and declined as academic years pass on. That increase in the second year might be due to the new environment for the students who moved from the preparatory year to the College of Medicine. Students may also hear stories from their senior colleagues about the difficulty of the curriculum.

This study shows no significant association between stress and students' academic performance. This is consistent with other studies[14, 17,26], However, Habeeb K et al found that stress was negatively correlated to students' score[14]. One study by Mirgh-

ni H et al showed no significant association between academic performance and perceived stress but found a significant association between performance and the learning approach[34]. Another study by Kumar M et al showed that as stress levels increase, academic performance inversely decreases in male students while in female students, as the level of stress increases, the academic performance increases35. A study at a medical college in Jeddah showed that there is a significant association between the previous year's grade point average (GPA) and stress, and that fear of exams increases the risk of perceiving stress by 4 folds[17].

Also, the results show no significant association between stress and the number of sleeping hours per day (p=0.487). This finding is congruous with other studies[15,19]. Studies showed that male students are prone more than female students to insomnia and a low number of sleeping hours[29]. No association was found between stress and physical exercise according to the study's findings[30]. This finding contradicts other studies which showed that physical exercise has a strong association with stress levels[31,32].

The study recommends that counseling and preventive measures such as mental health services are advised to be an essential addition to the clinical services for medical students. Student education through preventive stress programs may help in the management of stress.

## Conclusion

The study concluded that the prevalence of stress among medical students in the College of Medicine, Majmaah University, Saudi Arabia is extremely high, all students showed some level of stress. The level of stress is associated with gender, female students show more stress than male students. The level of stress is more prevalent in students in the pre-clinical phase compared to the students in the clinical phase of the study. The level of stress is not associated with the academic performance of the students, sleeping patterns, or physical exercise.

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