

REVIEW ARTICLE

# The Prevalence of Perceived Stress Related to the COVID-19 Pandemic Among Undergraduate Medical Students at the University of Al-Qadisiyah in Iraq

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## Abstract:

**Background:** The global pandemic has posed significant challenges for medical students, resulting in increased rates of depression, anxiety, and stress. The pandemic has also resulted in substantial disruptions to academic endeavors, clinical training, and prospective career opportunities. Many students have faced increased academic demands as they strive to adapt to virtual learning methods while also dealing with the uncertainty surrounding future clinical placements.

**Objective:** To assess the prevalence of perceived stress associated with the outbreak of Coronavirus disease 2019 (COVID-19) among medical students and to investigate potential correlating factors to higher prevalence.

**Subjects and methods:** The study constitutes a cross-sectional analysis which was constructed retrospectively through surveying 350 students who are currently at the 4th, 5th, and 6th stages of medical college. The online questionnaire contained a number of questions that were categorized into three sections including prevalence of stress, influence of socio demographic characteristics, and reflections of stress-related to the pandemic on student social life.

**Results:** The study found that 223(63.71%) students suffered from stress related to the pandemic. Stress was uniformly distributed among students according to age and sex, as non-significant association was discovered. However, being at an advanced stage of medical education imposed a significant association with high rates of stress ( $P=0.007$ ). Similar observation was also seen among students whose parents achieved higher education ( $P<0.001$ ) and those who are living in urban areas of cities ( $P=0.009$ ). Similarly, students who showed higher prevalence of stress were also more likely to present worse reflections on student personal and social life, ( $P<0.001$ ).

**Conclusion:** The study revealed that the COVID-19 pandemic has resulted in significant levels of stress among medical students that were evidently higher with every higher stage of medical education. The pandemic has also impacted students' social lives and compromised both psychological wellbeing and medical education. It is anticipated that the effects of COVID-19 on the study of medicine and the welfare of students will be substantial and enduring, highlighting the need for a comprehensive preparedness strategy.

**Keywords:** COVID-19 pandemic, perceived stress, medical students, survey, psychological impact.

## Introduction

COVID-19 viral infection, an extremely contagious multi-systemic disease that has been associated with high morbidity and mortality worldwide<sup>(1,2)</sup>. Nations that have suffered from the fast-spreading disease have applied first-level public movement reactions and other mitigation strategies as an attempt to curb the viral fast transmission. These included, quarantining of confirmed cases, monitoring and restricting suspected cases, closing public gathering places, and encouraging individuals

to stay at home<sup>(3)</sup>. However, prolonged lockdowns that were severely restricted normal activities were seen to have bad effects on work and study activities, among other effects. As a result, individuals have been forced to introduce significant modifications to daily routines, which has negatively impacted the general physical health, and the psychological and the emotional well-being of individuals<sup>(4)</sup>. The COVID-19 pandemic has had a tremendous impact on institutions of higher education around the globe, compelling these institutions to transition to new methods of instructions and training through



implementing remote virtual learning <sup>(5)</sup>. It was found that the lack of on-site communication with professors and peers, lack of access to laboratory facilities and reduced opportunities for practical learning have resulted in a sense of isolation and a decline in the quality of education <sup>(6)</sup>. Medical students require consideration amidst the COVID-19 pandemic due to their role as prospective healthcare providers, and the potential ramifications of COVID-19 on their future professional choices <sup>(7)</sup>. Therefore, it is essential to provide support and resources to medical students to help them cope with stress and maintain their well-being during these challenging times <sup>(8)</sup>.

### Subjects and methods

The study was a cross-sectional analysis which is constructed retrospectively on the perceived prevalence of stress among undergraduate medical students in the University of Al-Qadisiyah-Iraq during COVID-19 pandemic. The study took into the consideration of students' selection process to include those who are currently at the 4<sup>th</sup>, 5<sup>th</sup>, and 6<sup>th</sup> stages of their medical education to ensure that those students were at the time of the pandemic in 2019 enrolled as university students. The survey design, distribution, and data collection from responders were performed between March and July of 2023. The study included 350 valid responses from the online surveyed students, and all the response materials were digitally archived on excel sheets for later analysis. The provided questionnaire contained questions that mainly can be categorized into three sections as an overall and as categorized as according to the investigated responses regarding perceived stress among students, these included prevalence of stress, influence of socio demographic characteristics, and reflections of stress-related to the pandemic on student social life. The questionnaire was constructed using a combination of dichotomous, and multiple-choice questions.

The scientific and ethical approvals for the study were granted by the scientific panel of the College of Medicine in University of Al-Qadisiyah, and verbal consents were acquired from every participant following detailing purpose of the study. Statistical analysis included data processing for statistical evaluation was performed on Statistical Package for Social Science (SPSS) statistical software version 27 (IBM, USA). The study utilized numerical quantitative data to represent mean, range, and standard deviation, while qualitative data was presented in the type of number (n.) and percentages (%). The test of t-test was utilized to assess the mean differences of two sets of continuous data, whereas Fisher's test as well as chi-square assessment were applied for assessing the relationship which is involving two or more of the categorical variables. Correlative analysis through the employing of Spearman's correlation was used to examine relationship between variables. The level of significance is (P ≤ 0.05).

### Results

#### Prevalence of stress associated with COVID-19 pandemic

The prevalence of stress among enrolled students was estimated according to their responses on the question if the COVID-19 pandemic and the national lockdowns affect students stress level. Results showed that 59(16.86%) did not show to suffer from stress during the pandemic, 68(19.43%) reported lower rates of feeling stressed. However, the majority

of the students 223(63.71%) reported higher stress levels and worse than before the pandemic. Hence, the prevalence rate of stress among medical students enrolled in this study during the pandemic is 63.71%

#### Association of stress during COVID-19 pandemic to the socio demographic characteristics of enrolled students

The mean age of the students was (23.08±1.2) years ranging from 20-33 years of age. Slightly higher number of female students (198(56.6%)) enrolled to the study than to male students (152(43.3%)). The number of students per academic stage was 120(34.3%) students in fourth stage, 105(30.0%) fifth stage, and 125(35.7%) in sixth stage. Findings also showed that 106(30.3%) of students were smokers, 98(28.0%) working, 30(8.6%) are married, 95(27.1%) are living in rural areas, 42(12.0%) are living in rented houses, 28(8.0) are under low monthly income, 40(11.4%) are in university dormitory, and most of the students were from backgrounds of educated families, see table 1. Classification of the responders according to their responses regarding the stress associated with the pandemic, findings presented significant (P=0.007) number of students suffering from stress that is increasing with every advanced stage of education. Stress was also found higher among those who live in urban areas (P=0.009), and university dormitory, (P=0.032). Moreover, the results showed significant contribution of parents' education to perceiving higher stress felt by students, (P=0.001), table 1.

Table 1: Socio demographic characteristics of enrolled students as an overall and according to prevalence of stress

General characteristics of students	Total (n=350)	Stress associated with COVID-19 pandemic and national lockdowns			P value
		Neither (n=59)	Worse (n=223)	Better (n=68)	
<b>Gender</b>					
Female	198 (56.6)	30(50.8)	127(57.0)	41(60.3)	0.553
Male	152 (43.3)	29(49.2)	96(43.0)	27(39.7)	
Age (Mean ±SD) Years		23.19±1.7	23.14±1.1	22.7±1.1	0.147
Range (Years)	(20-33)	(21-33)	(20-33)	(20-25)	-
<b>Stage of study</b>					
Fourth	120 (34.3)	25(42.2)	64(28.7)	31(45.6)	0.007*
Fifth	105 (30.0)	22(37.3)	67(30.0)	16(23.5)	
Sixth	125 (35.7)	12(20.3)	92(41.3)	21(30.9)	
<b>Smoking tobacco</b>					
Nonsmoker	244 (69.7)	46(78.0)	142(63.7)	56(82.4)	0.004*
Smoker	106 (30.3)	13(22.0)	81(36.3)	12(17.6)	
<b>Working</b>					
No	252 (72.0)	36(61.0)	166(74.4)	50(73.5)	0.118
Yes	98 (28.0)	23(39.0)	57(25.6)	18(26.5)	
<b>Marital state</b>					
Single	319 (91.1)	54(91.5)	202(90.6)	63(92.6)	0.944
Married	30 (8.6)	5(8.5)	20(9.0)	5(7.4)	
Divorced	1 (0.3)	0(0.0)	1(0.4)	0(0.0)	
<b>Residential area</b>					
Rural	95 (27.1)	25(42.4)	57(25.6)	13(19.1)	0.009*
Urban	255 (72.9)	34(57.6)	166(74.4)	55(80.9)	
<b>Type of housing</b>					
Owned	308 (88.0)	54(91.5)	190(85.2)	64(94.1)	0.063
Rented	42 (12.0)	5(8.5)	33(14.8)	4(5.9)	
<b>Family income / month</b>					
≤ 500,000	28 (8.0)	7(11.9)	14(6.3)	7(10.3)	0.251
500,000-1,000,000	257 (73.4)	37(62.7)	170(76.2)	50(73.5)	
≥ 1,000,000	65 (18.6)	15(25.4)	39(17.5)	11(16.2)	
<b>Living accommodation</b>					
Home	310 (88.6)	56(94.5)	190(85.2)	64(94.1)	0.032*
Dormitory	40 (11.4)	3(5.1)	33(14.8)	4(5.9)	
Number of family members (Median, IQR)	5.0 (3.0)	6.0(2.0)	5.0(2.0)	6.0(2.0)	0.362
<b>Father's occupation</b>					

Employed	125 (35.7)	20(33.9)	73(32.7)	32(47.1)	0.069
Worker	164 (46.9)	24(40.7)	115(51.6)	25(36.8)	
Retired	61 (17.4)	15(25.4)	35(15.7)	11(16.2)	
Father's education					
Primary	22 (6.3)	7(11.9)	9(4.0)	6(8.8)	0.001*
Secondary	70 (20.0)	6(10.2)	49(22.0)	15(22.1)	
College	221 (63.1)	35(59.3)	151(67.7)	35(51.5)	
Higher	37 (10.6)	11(18.6)	14(6.3)	12(17.6)	
Mother's Education					<0.001*
Primary	54 (15.4)	13(22.0)	30(13.5)	11(16.2)	
Secondary	95 (27.1)	5(8.5)	69(30.9)	21(30.9)	
College	171 (48.9)	30(50.8)	114(51.1)	27(39.7)	
Higher	30 (8.6)	11(18.6)	10(4.5)	9(13.2)	

n: number of cases SD: standard deviation \* Significant association IQR: interquartile range  
Reflections of stress-related to the pandemic on student personal and social life

Regarding the first question of how to perceive the COVID-19 contagion, most of the responders (127 (36.3%)) linked the contagion with moderate level of stress. A similar response was also reported regarding the second question of the condition of social isolation, being moderately stressful in 151(43.1%). Regarding students' social life and relationships with relatives, 41(11.7%) students identify this point as extremely stressful, also was extremely stressful to 43(12.3%) of the responders related to relationship with university colleagues, 54 (15.4%) to professors, and 47 (13.4%) to the overall academic experience in general. Statistical analysis revealed significant differences (P<0.001) among responders regarding the first question according to the response of stress associated with the pandemic. In fact, those how felt worse of stress during the pandemic were the highest in proportions to those either stated neither or better in five out of six of the investigated questions from this part of the study, table 2. Therefore, A significant association between prevalence of stress and higher perceived stress among students was reported in second (P<0.001), third (P<0.001), fourth (P<0.001), and fifth (P=0.040) of the investigated questions. However, the perceived stress related to academic experience during the pandemic was not significantly associated (P=0.417) with either of the responses according to the findings from stress associated with the pandemic. Here, it appears that students were generally conflicted on this question, alas most of the students still found it moderately stressful, table 2.

Table 2: Association between perceived stress among medical students during the COVID-19 pandemic and the personal reflections on personal and social life.

Perceived stress	Total	Stress associated with COVID-19 pandemic and national lockdowns			P value
		Neither (n=59)	Worse (n=223)	Better (n=68)	
How do you perceive the contagion during COVID-19?					
Not at all stressful	46 (13.1)	18(30.5)	17(7.6)		<0.001
Somewhat stressful	107 (30.6)	21(35.6)	61(27.4)		
Moderately stressful	127 (36.3)	19(32.2)	86(38.6)		
Extremely stressful	70 (20.0)	1(1.7)	59(26.5)		
How do you perceive the condition of social isolation during COVID-19?					

Not at all stressful	44 (12.6)	21(35.6)	16(7.2)		<0.001
Somewhat stressful	81 (23.1)	19(32.2)	37(16.6)		
Moderately stressful	151 (43.1)	16(27.1)	111(49.8)		
Extremely stressful	74 (21.1)	3(5.1)	59(26.5)		
How do you perceive the relationship with your relatives during COVID-19?					
Not at all stressful	74 (21.1)	27(45.8)	34(15.2)		<0.001
Somewhat stressful	100 (28.6)	13(22.0)	65(29.1)		
Moderately stressful	135 (38.6)	16(27.1)	93(41.7)		
Extremely stressful	41 (11.7)	3(5.1)	31(13.9)		
How do you perceive the relationship with university colleagues during COVID-19?					
Not at all stressful	81 (23.1)	25(42.4)	34(15.2)		<0.001
Somewhat stressful	84 (24.0)	14(23.7)	51(22.9)		
Moderately stressful	142 (40.6)	14(23.7)	107(48.0)		
Extremely stressful	43 (12.3)	6(10.2)	31(13.9)	6(8.8)	
How do you perceive the relationship with university professors during COVID-19?					
Not at all stressful	78 (22.3)	18(30.5)	44(19.7)		0.040
Somewhat stressful	78 (22.3)	18(30.5)	45(20.2)		
Moderately stressful	140 (40.0)	12(20.3)	98(43.9)		
Extremely stressful	54 (15.4)	11(18.6)	36(16.1)		
How do you perceive your academic studying experience during COVID-19?					
Not at all stressful	79 (22.6)	15(25.4)	48(21.5)		0.417
Somewhat stressful	74 (21.1)	17(28.8)	40(17.9)		
Moderately stressful	150 (42.9)	20(33.9)	102(45.7)		
Extremely stressful	47 (13.4)	7(11.9)	33(14.8)		

n: number of cases

## Discussion

### Prevalence of stress

The current study showed a high proportion of the surveyed medical students suffered from stress related to the pandemic significantly higher than the pre-pandemic time. The prevalence of stress was estimated at 63.71%. In fact, most of the published work is in accordance with the findings of this study. A study by Puranachaikere's (2021) showed that medical students in Thailand encountered elevated levels of stress amid the pandemic compared to pre-pandemic levels, primarily due to the modifications in teaching and evaluation methods (9). A study conducted by Natalia's 2021 study, a considerable proportion of medical students who participated in the survey reported experiencing stress (44.6%), depression (18.6%), and anxiety (47.8%) amidst the pandemic (10). Wood's (2022) study showed that college students experienced elevated levels of despair, feelings of isolation, sadness, anger, and depression during the pandemic compared to their pre-pandemic state (11). In Saudi Arabia, the incidence of symptoms related to anxiety, stress, and depression was found to be elevated among medical students throughout the period of quarantine and online learning(12).

The influence of socio demographic characteristics on perceived stress among students

A strong association between higher levels of stress and stages of medical education was found, (P=0.007). The findings present an agreement with Chakeeyanun and others who stated, that the introduction of final-year medical students into the healthcare system was associated with increased

rates of stress, depression and anxiety<sup>(13)</sup>. A study conducted by Abdulghani (2020) revealed that female medical students exhibited a significantly higher prevalence of overall stress, with the highest levels being reported during the third year of medical school<sup>(14)</sup>. Before the pandemic, Abdulghani and others found that throughout the first three years of higher education and among female students, the incidence of stress was shown to be significantly greater<sup>(15)</sup>. The study also showed that living in the urban areas was associated with a high rate of stress among surveyed students, ( $P=0.009$ ). A significant increase in the occurrence of risk factors linked to mental health issues was seen among individuals residing in urban areas<sup>(16)</sup>.

The additional significant contributors to the witnessed higher rate of stress among students was higher parents' education, ( $P=0.001$ ) for father and ( $P<0.001$ ) for mother, and type of living accommodation ( $P=0.032$ ). According to Renk's research, parenting style, specifically the level of parental support, has the potential to serve as an indicator of academic-related stress among college students<sup>(17)</sup>. There exists a correlation between the perceived levels of parental pressure and support and the changes in stress levels of students during the transitional period of education<sup>(18)</sup>.

Reflections of stress-related to the pandemic on student social life

Findings from this part of the study (table 2) revealed a significant accordance with a study from India which stated that 56.5% of the participants reported low levels of perceived stress, while 32.7% reported moderate levels of stress, and 10.8% reported high levels of stress<sup>(19)</sup>.

Regarding solation, findings showed that 76.3% of the enrolled students described social isolation as key factor in a generating a feeling of "Moderately stressful to Extremely stressful situation", as being 111(49.8%), and 59(26.5%) of the students respectively, table 2. According to a study, the COVID-19 pandemic and related measures, such as loneliness and social distancing, may be linked to heightened levels of depression, anxiety, and stress among medical undergraduates<sup>(20)</sup>. According to Werner's (2021), the experience of loneliness throughout the pandemic was linked to the manifestation of signs and symptoms of anxiety, depression, and other emotional and psychological disorders among college students in Germany<sup>(21)</sup>. However, over 50% of the survey students by this study described relationship to relatives, colleagues, and professors as "Moderately stressful to Extremely stressful situation", table 2. Stress related to academic performance did not show to be different among surveyed students by the current study, table 2. However, over 55% of the investigated students stated as "Moderately stressful to Extremely stressful situation", table 2, according to the academic performance. A recent investigation carried out in India has revealed a link between academic achievement and stress among medical students amidst the COVID-19 pandemic. The study has identified a significant association between stress and educational achievement<sup>(22)</sup>.

## Conclusion

The shift towards virtual learning and the cessation of clinical

exposure along with limited and poor social life have presented perceived notable obstacles to students educational, that left students with high rates of stress and feelings of diminished fundamental proficiencies in comparison to their peers who underwent training prior to the COVID era.

Acknowledgment: I would like to express my deep thanks to Allah for giving me the strength ,special kind of thanks and appreciation to Dr. Hassan Raji for his supervision, knowledge, and all medical students who are participate in this study.

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