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Depression, anxiety, and stress among medical students of College of Medicine, Hawler Medical University, Erbil, Iraq

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Abstract

Background and objective: Students of the college of medicine involve in a hard study and training for six years; which might adversely affect the student's mental health and physical condition. This study aimed to identify the prevalence of depression, anxiety, and stress among medical students, and its association with different sociodemographic variables.

Methods: A cross-sectional study was conducted among students of the College of Medicine, Hawler Medical University from April to May 2017. This study included a randomly selected sample of 288 students. The Depression, Anxiety, and Stress Scale-21 (DASS-21) questionnaire was used to collect data. The statistical package for the social sciences was used for data analysis. Pearson Chi-square and Fisher's Exact Test were used to finding the association between various variables and depression, anxiety, and stress.

Results: The prevalence of depression, anxiety, and stress among medical students were 52.1%, 62.5%, and 45.1%, respectively. Male students were found to be more depressed than female students (63.6% vs. 42.3%) with a statistically significant association (P <0.001). Anxiety and stress were not significantly associated with gender. Anxiety among students from rural areas (88.9%) was significantly (P = 0.021) higher than students from urban areas (60.7%). The association of depression, anxiety, and stress with other variables was not significant.

Conclusion: The prevalence of depression, anxiety, and stress among students was high. Male students were regarded as a risk factor for depression, while students from the rural areas were regarded at risk of anxiety.

Keywords: Depression; Anxiety; Stress; Medical students.

Introduction

The period in which people transmit from adolescent to adulthood is a critical, stressful, and transitory period; university students are those special people that were enduring this period.[1] Students of the college of medicine involved in a hard study and training for six years, during this time they should acquire adequate skills, attitudes, and professional knowledge, to independently deal with life-long professional challenges, this may adversely affect the student's mental health and physical condition.[2] By using several instruments, high rates of psychological morbidity among medical students have been reported.[3] Most probably, these findings are related to social, financial, and academic demands, that put on students by the nature of the college environments, and by other issues related to student's lifestyle.[4] Depression is a common mental disorder. An individual with depression presents with depressed mood, loss of pleasure or interest, disturbed sleep or appetite, feelings of guilt or low self-worth, decreased energy, and poor concentration.[5] Fear is the emotional response to real or perceived imminent threat, whereas anxiety is anticipation of

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future threat.[6] Stress is "the nonspecific response of the body to any demand".[7] It is a natural reaction that individual experiences and it is a part of physiological nature of the human body in response to the perceived threat or danger.[8] Stress during education has a negative impact on learning and cognitive functioning.[9] When exposure to stress prolonged over a long periods, this may impair immune system and can cause physical and mental disorders.[10] Therefore, this study aimed to identify the prevalence of depression, anxiety, and stress among medical students of the College of Medicine of Hawler Medical University, and its association with different sociodemographic variables.

Methods

A cross-sectional study was conducted on students of all academic years at the College of Medicine, Hawler Medical University from April to May 2017. The total number of students of the College of Medicine during the study year 2016/2017 was 1001. The minimum recommended sample size was 278 students from the 1001 students, measured by using the sample size calculator program. The information that were entered into the program included a maximum acceptable error of 5%, desired confidence level of 95%, and response distribution of 50%.[11] However, 700 students had been selected through stratified random sampling in which the first seven students from each ten had been selected by using the list of students taken from the registration department. A similar number of questionnaires had been distributed among the selected students to overcome the non-respondents and questionnaires with missed data. Out of 700 distributed questionnaires, 430 were returned; 142 of them had been excluded (122 included missed data, and 20 had either chronic medical diseases or known psychiatric illnesses or both of them). In the end, the remained number of the questionnaires was 288 only. This study was approved by the Ethics Committee and Scientific Research Units in Kurdistan Board of Medical Specialties (KBMS). Administrative approval was taken from the College of Medicine, Hawler Medical University, and written informed consent was obtained from all participants before filling the questionnaires. A self-administered predesigned questionnaire was used to assess sociodemographic data of the students, in addition to other variables like smoking and personal history of the chronic medical disease (like diabetes mellitus and hypertension) and psychiatric illness (Like depression, generalized anxiety disorder, and bipolar disorder). All students of the College of Medicine of Hawler Medical University were included, and any student was complaining of any chronic medical diseases or psychiatric illnesses was excluded from the study. Depression, anxiety, and stress were assessed by using the standardized Depression Anxiety Stress Scale-21 Items (DASS21). This questionnaire is a set of three self-report scales designed to measure the emotional states of depression, anxiety, and stress. Each of the three DASS-21 scales contains seven items; divided into subscales with similar content.[12] The depression scale assesses devaluation of life, self-deprecation, dysphoria, and hopelessness, lack of interest and involvement, inertia and anhedonia. The anxiety scale assesses autonomic arousal, situational anxiety; subjective experience of anxious affect and skeletal muscle effects, the stress scale is sensitive to levels of chronic nonspecific arousal. It assesses nervous arousal, being easily upset/agitated, and difficulty relaxing, impatient and irritable/ over-reactive. Scores for depression, anxiety, and stress are calculated by summing the scores for the relevant items. The socioeconomic status of the participant was determined through the number of years of formal education of both father and mother, number of family members, type of housing, e.g., owned or

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rented, number of rooms, possession of the car, and monthly income. This system quoted with modifications from other studies.[13] After explaining the aim of study for the participants and ensuring the confidentiality for all of them, the self-administered questionnaires were distributed. Filling the questionnaire was taking about 12 to 15 minutes. All demographic data and questionnaire results were registered in a special inventory and analyzed by using the statistical package for the social sciences (version 21.0 for Windows). We used the Chi-square test statistic (x^2) to find the significance of the association between various variables and depression, anxiety, and stress. When the expected count of more than 20% of the cells of the tables was less than 5, Fisher's exact test was used. When the *P* value was <0.05, it was considered statistically significant.

Results

The range of participant's age was between 17 to 26 years. Other sociodemographic characteristic features are shown in Table 1. The prevalence of depression, anxiety, and stress among medical students was 52.1%, 62.5%, and 45.1% respectively. Depression was found to be more among males than females (63.6% vs. 42.3%, *P* <0.001). Regarding anxiety and stress, there was no significant association with gender. Anxiety among students from rural areas (88.9%) was significantly higher than students from urban areas (60.7%), *P*= 0.021. Otherwise, the association of depression, anxiety, and stress with other variables was not significant.

Table 1: Sociodemographic characteristics of the students.

Characteristics		Number	(%)
Gender	Males	132	(45.8)
	Female	156	(54.2)
Marital State	Single	274	(95.1)
	Married	13	(4.5)
	Separated	1	(0.3)
Stage of study	First stage	46	(16.0)
	Second Stage	41	(14.2)
	Third Stage	40	(13.9)
	Fourth Stage	55	(19.1)
	Fifth Stage	58	(20.1)
	Sixth Stage	48	(16.7)
Residence	Urban	270	(93.8)
	Rural	18	(6.3)
Religion	Muslim	266	(92.4)
	Christian	16	(5.6)
	Yezidi	1	(0.3)
	Others	5	(1.7)
Ethnicity	Kurd	263	(91.3)
	Arab	11	(3.8)
	Turkmen	2	(0.7)
	Other	12	(4.2)
Smoking	Not smoker	267	(92.7)
	Smoker	21	(7.3)
Socioeconomic Status	Low Status	10	(3.5)
	Medium Status	78	(27.1)
	High Status	200	(69.4)
Total		288	(100.0)

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Table 2 to 9 show the association of depression, anxiety, and stress with the variables.

Table 2: Prevalence of depression, anxiety, and stress by gender.

Variables		Gender		Total No. (%)	*P* value
		Male No. (%)	Female No. (%)		
Depression	Present	84 (63.6)	66 (42.3)	150 (52.1)	<0.001*
	Absent	48 (36.4)	90 (57.7)	136 (47.9)	
Anxiety	Present	88 (66.7)	92 (59.0)	180 (62.5)	0.222*
	Absent	44 (33.3)	64 (41.0)	108 (37.5)	
Stress	Present	62 (47.0)	68 (43.6)	130 (45.1)	0.635*
	Absent	70 (53.0)	88 (56.4)	158 (54.9)	

*Chi-square test

Table 3: Prevalence of depression, anxiety and stress by marital status.

Variables		Marital status			Total No. (%)	*P* value
		Single No.(%)	Married No. (%)	Separated No. (%)		
Depression	Present	143 (52.2)	6 (46.2)	1 (100)	150 (52.1)	0.885*
	Absent	131 (47.8)	7 (53.8)	0 (0)	138(47.9)	
Anxiety	Present	169 (61.7)	10 (76.9)	1 (100)	180 (62.5)	0.529*
	Absent	105 (38.3)	3 (23.1)	0 (0)	108 (37.5)	
Stress	Present	126 (46.0)	4 (30.8)	0 (0)	130 (45.1)	0.395*
	Absent	148 (54.0)	9 (69.2)	1 (100)	158 (54.9)	

*Fisher's Exact Test.

Table 4: Prevalence of depression, anxiety, and stress by stage of the study.

Variables		Stage of study						Total No. (%)	*P* value
		First No. (%)	Second No. (%)	Third No. (%)	Forth No. (%)	Fifth No. (%)	Sixth No. (%)		
Depression	Present	25 (54.3)	28 (68.3)	24 (60.0)	28 (50.9)	24 (41.4)	21 (43.8)	150 (52.1)	0.093*
	Absent	21 (45.7)	13 (31.7)	16 (40.0)	27 (49.1)	34 (58.6)	27 (56.3)	138 (47.9)	
Anxiety	Present	32 (69.6)	33 (80.5)	26 (65.0)	32 (58.2)	32 (55.2)	25 (52.1)	180 (62.5)	0.056*
	Absent	14 (30.4)	8 (19.5)	14 (35.0)	23 (41.8)	26 (44.8)	23 (47.9)	108 (37.5)	
Stress	Present	24 (52.2)	21 (51.2)	21 (52.5)	29 (52.7)	17 (29.3)	18 (37.5)	130 (45.1)	0.058*
	Absent	22 (47.8)	20 (48.8)	19 (47,5)	26 (47.3)	41 (70.7)	30 (62.5)	158 (54.9)	

* Chi-square test.

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Table 5: Prevalence of depression, anxiety, and stress by residence.

Variables		Residence		Total No. (%)	*P* value
		Urban No. (%)	Rural No. (%)		
Depression	Present	137 (50.7)	13 (72.2)	150 (52.1)	0.091*
	Absent	133 (49.3)	5 (27.8)	138 (47.9)	
Anxiety	Present	164 (60.7)	16 (88.9)	180 (62.5)	0.021*
	Absent	106 (39.3)	2 (11.1)	108 (37.5)	
Stress	Present	119 (44.1)	11 (61.1)	130 (45.1)	0.221*
	Absent	151 (55.9)	7 (38.9)	158 (54.9)	

* Chi-square test.

Table 6: Prevalence of depression, anxiety, and stress by Religion.

Variables		Religion				Total No. (%)	*P* value
		Muslims No. (%)	Christian No. (%)	Yezidi No. (%)	Others No. (%)		
Depression	Present	140 (52.6)	7 (43.8)	0 (0)	3 (60.0)	150 (52.1)	0.727*
	Absent	126 (47.4)	9 (56.3)	1 (100)	2 (40.0)	138 (47.9)	
Anxiety	Present	169 (63.5)	7 (43.8)	1 (100)	3 (60)	180 (62.5)	0.345*
	Absent	97 (36.5)	9 (56.3)	0 (0)	2 (40)	108 (37.5)	
Stress	Present	121 (45.5)	6 (37.5)	1 (100)	2 (40)	130 (45.1)	0.777*
	Absent	145 (54.5)	10 (62.5)	0 (0)	3 (60)	158 (54.9)	

*Fisher's Exact Test.

Table 7: Prevalence of depression, anxiety, and stress by Ethnicity.

Variables		Ethnicity				Total No. (%)	*P* value
		Kurd No. (%)	Arab No. (%)	Turkmen No. (%)	Others No. (%)		
Depression	Present	139 (52.9)	4 (36.4)	1 (50.0)	6 (50)	150 (52.1)	0.786*
	Absent	124 (47.1)	7 (63.6)	1 (50.0)	6 (50)	138 (47.9)	
Anxiety	Present	168 (63.9)	6 (54.5)	1 (50.0)	5 (41.7)	180 (62.5)	0.343*
	Absent	95 (36.1)	5 (45.5)	1 (50.0)	7 (58.3)	108 (37.5)	
Stress	Present	119 (45.2)	6 (54.5)	0 (0)	5 (41.7)	130 (45.1)	0.695*
	Absent	144 (54.8)	5 (45.5)	2 (100)	7 (58.3)	158 (54.9)	

*Fisher's Exact Test.

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Table 8: Prevalence of depression, anxiety, and stress by smoking.

Variables		Smoking		Total No. (%)	*P* value
		Not-Smoker No. (%)	Smoker No. (%)		
Depression	Present	136 (50.9)	14 (66.7)	150 (52.1)	0.181*
	Absent	131 (49.1)	7 (33.3)	138 (47.9)	
Anxiety	Present	165 (61.8)	15 (71.4)	180 (62.5)	0.485*
	Absent	102 (38.2)	6 (28.6)	108 (37.5)	
Stress	Present	120 (44.9)	10 (47.6)	130 (45.1)	0.824*
	Absent	147 (55.1)	11 (52.4)	158 (54.9)	

* Chi-square test.

Table 9: Prevalence of depression, anxiety and stress bysocioeconomic State.

Variables		Socioeconomic State			Total No. (%)	P value
		Low No. (%)	Medium No. (%)	High No. (%)		
Depression	Present	6 (60.0)	44 (56.4)	100 (50.0)	150 (52.1)	0.584*
	Absent	4 (40.0)	34 (43.6)	100 (50.0)	138 (47.9)	
Anxiety	Present	9 (90.0)	52 (66.7)	119 (59.5)	180 (62.5)	0.104*
	Absent	1 (10.0)	26 (33.3)	81(40.5)	108 (37.5)	
Stress	Present	5 (50.0)	34 (43.6)	91 (45.5)	130 (45.1)	0.899*
	Absent	5 (50.0)	44 (56.4)	109 (54.5)	158 (54.9)	

* Chi-square test.

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Discussion

About depression, the results of our study revealed that the prevalence of depression among medical students was 52.1%, which is consistent with a previous study from Urmia, Iran (52.6%),[14] another study from Yazd, Iran (50%),[15] and two other studies from in India (49.1% and 51.3%).[16,17] Two studies from Egypt showed that the prevalence of depression was 60.2%[3] and 57.9%,[18] while it was 43.89% in another study from Pakistan,[4] and 49% in a study from the United States.[18] Regarding anxiety, our study revealed that the prevalence of anxiety among medical students was 62.5%, which is comparable to other studies. In a cross-sectional study from Egypt which was conducted among medical students and also used DASS-21 Scale, the prevalence was 65%.[3] Another study from Egypt showed a prevalence of 43.9% where the Beck depression inventory (BDI) was used and included a sample of 145 students.[18] A cross-sectional study from Pakistan, which used structured a validated questionnaire, the Aga Khan University Anxiety and Depression Scale, showeda prevalence of 43.8%.[4] A cross-sectional study from India revealed a prevalence of 66.9%.They used the Depression Anxiety Stress Scale DASS-42, with a sample of 353 students.[17] In Karachi, Pakistan, the prevalence was70%.[9] The prevalence was 47.9% among Al-Qadisia medical students,Iraq.[19] The prevalence of stress in our study was 45.1%, and the prevalence was 53% in India,[17] 44.1% in Malaysia,[20] 61.4% in Thai,[21] 62.5% in Egypt,[3] 57% in Saudi Arabia,[22] 61.3% in Iran,[23] and 47.1% in Brazil.[24] Previous studies showed that females develop more anxiety and depression than males in the general population, but data for medical students are conflicting.[24] We found in our study that depression is more common among males than females (63.6% *vs*. 42.3%). This is consistent to another study that was conducted on the first-year medical students in an Egyptian public university and used DASS-21, which revealed a higher prevalence of depression among males than females (53.9% vs. 46.1%).[25] Another study on Malaysian students in a public university using DASS-21also revealed a higher prevalence of depression among males than females (39% vs. 29.4%).[26] In other studies among medical students, there was no association between gender and depression.[1,14,18,27-29] In some other studies, depression was more common among female medical students than males.[1,16,17,24,30] The most likely explanation of the inconsistent data about gender difference is most likely due to multi factorial, including sociocultural, biological, or variable combinations of each.[31] Other reasons may be more specific to the culture of our students that males take more responsibilities than females toward many domains of the life and at the time of doing this study there were economic and political crises. This may contribute that males appeared more depressed than females. We found in our study no significant association between anxiety and gender, which is consistent with some studies.[26-28] However, anxiety was more prominent in females than males in other studies.[17,24,25,29,30] We found in our study no significant association between stress and gender, which is consistent with many previous studies.[8,20,23,28,32-38] In contrast, many other studies showed a higher prevalence in female.[3,17,24,25,39-41] This difference might be related to the differences in the sociocultural background of the participants and using different tools in these studies. Regarding the association with other variables, we found no association between depression and residence. This is consistent with two previous studies.[3,4] However, there was a significant association of depression with the rural area in another study.[25] There was no association with marital status, which is consistent with two previous studies.[3,4] There was also no association with religion, which is in contrast with another study.[24] Also, no association was found with ethnicity, which is consistent with

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a previous study.[24] There was no association with smoking, which is in contrast to a previous study that revealed high scores of depression among non-smoker students.[17] Also, we found no association with socioeconomic status, which is consistent with a previous study[28] and is in contrast with another one which revealed a significant association of depression with the low socioeconomic state.[3] There was no significant association with the stage (class) of the study. Most probably, there are other factors stronger than the effects of these variables that have shown no association which contribute to developing depression, and different studies showed different results. In our study, we found a significant association between anxiety and residency as anxiety score was higher among students from rural areas than urban areas. This result is in contrast with previous studies that revealed no significant association between anxiety and residency.[3,4,19,25] This difference may be due to using different tools by our study and other, and sociocultural factors like the bad situation of public transport and living far away from their families. There was no significant association with the marital state, which is consistent with other studies.[3,4] There was no association with religion and ethnicity, which is also consistent with another study.[24] We found no association with smoking, while in one study, anxiety was associated with non-smoking.[17] There was no association with socioeconomic status as in two previous studies.[3,28] Regarding stress, we found no association between stress and the residence like in other studies.[3,42] However, another study revealed that students from rural areas had more stress than from urban areas.[25] There was no association with the marital status, which is consistent with one previous study,[20] but in contrast to two other studies, which revealed that married students were less prone to stress.[3,23] There was no association with religion as in another study.[24] and no association with ethnicity as in other studies.[24,43] There was no association with smoking, which is in contrast to two other studies, one of them revealed more stress among non-smoker,[17] while the second one revealed more stress among smoker students.[44] There was no association with the socioeconomic status, which is consistent with another study.[28] while is in contrast to two other studies: one of them revealed more stress among low socioeconomic status,[3] while in the second one there was more stress among high socioeconomic status.[8] Most probably, there are many factors contributed in revealing this high prevalence of depression, anxiety, and stress among medical students. They may be related to the effects of economic and political crises in our country, which has started about three years before doing this study and continued even after that, and the student's perspective toward them. The nature of college programs of the teaching inside the college might have a great role. There might be more personal causes, which need more exploration in further future studies to reach to the more precise causes behind it. This study is limited by having a high non-response rate, which may have a significant effect on the results because out of 700 distributed questionnaires, only 430 were returned, and 122 of them included missed data. To identify the secondary causes of depression, anxiety, and stress (organic causes), we need a complete history and thorough physical examination. The number of immigrant students was not identified; this may have a significant effect on the results. We depended on the participants, to know if they are complaining from any chronic medical illness or psychiatric illness, for exclusion.

Conclusion

High prevalence of depression, anxiety, and stress among medical students might mean a high pressure on medical student's mental health and might cause a negative

impact on student's performance. This may be related to the nature of college programs of the teaching, students perspective toward economic and political crises in our country, or other more personal causes which need more exploration in further future studies.

Competing interests

The authors declare that they have no competing interests.

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