RESEARCH ARTICLE

Determinants of depression among undergraduate medical students of a private medical college in Lahore

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Abstract

Objective: To assess the prevalence and determinants of depression in undergraduate medical students within their learning environment.

Methods: The descriptive cross-sectional study was conducted at the Lahore Medical and Dental College, Lahore, Pakistan, from May to June 2015, and comprised medical students of all the five professional years. A structured questionnaire was used to collect data. Section one of the questionnaire related to demographic information, section two comprised Patient health questionnaire-9 for screening depression, and section three was the Dundee ready education environment measure inventory to gather students' perceptions of their learning environment. Data was analysed using SPSS 22.

Results: Of the 533 students, 206(39%) were males, 327(61%) were females, 213(40%) were of pre-clinical years and 320(60%) were of clinical academic years. Overall, 399(75%) students were found to be depressed. Of them, 255(64%) were females and 144(36%) were males. Among the students, 96(18%) had negative perception of their learning environment, and out of these, 91(95%) were found to be depressed. There was significant association of depression with female gender ($p=0.037$) and negative perception of the students of their learning climate ($p<0.001$).

Conclusion: The prevalence of depression was found to be high among the medical students and it was associated with female gender and negative perception of the learning environment.

Keywords: Patient health questionnaire-9, Depressive symptoms, Environmental determinants, DREEM inventory. (JPMA 70: 467; 2020). **https://doi.org/10.47391/JPMA.13896**

Introduction

[1]Depression is a mood disorder characterised by constant feeling of sadness and loss of interest in routine activities.[1] Various studies have revealed high rate of mental agony, depressive symptoms and suicidal rates among undergraduate medical students.[2,3] According to the Journal of the American Medical Association (JAMA), 30% of the medical students suffer from depression and one out of 10 is reported for experiencing suicidal thoughts.[4] Prevalence of depression in medical students is five times higher than the general population due to various environmental, social and demographic factors. Environmental determinants might be academic such as persistent struggle to achieve high grades or to get admission in good medical programmes, extreme residency conditions and sleep deprivation.[5] Medical education being a stressful experience immensely affects the learning and cognitive abilities of the students, thus diminishing their efficiency and productivity over the span of academic tenure and youthful pursuits.[6] Severe stress and depression impair the ability of students to cope with the enormous burden of education, resulting in a cascade of adverse consequences in professional and personal lives. Psychological, emotional and mental health problems account more for morbidity and disability than the physical or medical health problems combined.[7] There is an emerging need to realise the magnitude of depression among medical students and curb this distress by overcoming the barriers between the facilitators and students through initiating student counselling and advocating programmes.[8,9]

The current study was planned to estimate the prevalence of depression among undergraduate medical students at an institution, and to find its association with socio-demographic and environmental determinants at the medical school.

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Subjects and Methods

Lahore Medical and Dental College, Lahore, Pakistan, from May to June 2015, and comprised medical students of all the five professional years. After approval by the institutional ethics review board, all the registered medical students of all the five professional years were approached for participation in the study. Students present on the day of the survey were approached in their classes and briefed about the study purpose and the questionnaire. Those who consented to participate were provided with the questionnaire and it took approximately 20 minutes for each of them to complete the questionnaire. Those who refused to participate or had any evidence of psychiatric/neurological problems were excluded.

The questionnaire comprised demographic information and two validated tools; the Patient health questionnaire-9 (PHQ-9) and the Dundee ready educational environmental measure (DREEM) inventory. The demographic information included gender, age group in years, entry qualifications and present year of education. Students of 1st and 2nd years were categorised as pre-clinical and from 3rd to 5th year as clinical years. PHQ-9 is a validated tool and assists in evaluation, screening and provisional diagnosis of depression. It includes nine questions and score ranges between 0-27. Cut off score limits are; 0-4 no/minimal depression, 5-9 mild depression, 10-14 moderate depression, 15-19 moderately severe depression, and 20-27 severe depression.[10,11]

The DREEM inventory comprises 50 items which are subdivided into the following five subclasses: Students' perceptions of learning (SPL; -12 items), Students' perceptions of teachers (SPT; 11 items), Students' academic self-perceptions (SASP; 8 items), Students' perceptions of atmosphere (SPA; 12 items) and Students' social self-perceptions (SSSP; 7 items). Each item in the subclass is scored from 0 to 4 on a Likert scale. The option ranges from 4 for Strongly Agree (SA), 3 for Agree (A), 2 for Uncertain (U), 1 for Disagree (D), 0 for Strongly Disagree (SD). Total DREEM score ranges between 0 and 200, and is interpreted as 0-50 -poor, 51-100 - plenty of problems, 101-150 - more positive, 151-200 -- excellent.[12-14]

In the present study, depression categories and students' perceptions were converted into binary variables. On the basis of PHQ-9, two classes of depression were defined as 0 to 4 "Depression absent", and 5-27 "Depression present".

Table-1: Dundee ready education environment measure (DREEM) Inventory score categories.

DREEM Inventory Score (0-200)	Negative perception 0-100	Positive perception 101-200
SPL (0-48)	0-24	25-48
SPT (0-44)	0-22	23-44
SASP (0-32)	0-16	17-32
SPA (0-48)	0-24	25-48
SSSP (0-28)	0-14	15-28

SPL: Students' Perception of Learning, SPT: Students' Perception of Teaching, SPA: Students' Perception of Atmosphere, SASP: Students' Academic Self Perception, SSSP: Students' Social Self Perception.

Perceptions of the students were also categorised into negative and positive on the basis of Total DREEM and its subclasses score (Table-1).

Data was analysed using SPSS 22. Frequencies and percentages were calculated for categorical variables, such as gender, age group in years, proportion of students in academic years, presence or absence of depression and negative or positive perceptions of the participants. Chi-square test was used to find the association of depression with baseline characteristics of the study population and their perceptions of the learning climate. $P \leq 0.05$ was considered statistically significant. Odds ratio (OR) was also calculated and confidence interval (CI) was determined.

Results

Of the 763 registered medical students, 533(70%) completed the questionnaire. Among these students,

Table-2: Background characteristics of the study participants (n=533).

Characteristics	n (%)
Age groups in years	
18-21	307(57.5)
22-25	226 (42.5)
Gender	
Male	206 (38.6)
Female	327(61.4)
High school education	
F. Sc.	396(74.3)
A-levels	13(25.7)
Academic Years	
Pre-Clinical	213(40)
Clinical	320(60)
Perceptions about Learning Environment	
Negative	96(18)
Positive	437(82)
Depression	
Present	399(75)
Absent	134(25)

F.Sc.: Faculty of Sciences.

Table-3: Socio-demographic determinants of depression in medical students (n-533).

Socio-demographic characteristics(n)	Depression present 399(%)	Depression absent 134(%)	Odds Ratio	95% Confidence Interval	*p*-value
Age groups in years					
18-21 (307)	224(56.0)	83(62)	0.78	0.52-1.17	0.24
22-25 (226)	175(44.0)	51(38)			
Gender					
Female (327)	255(64.0)	72(53.7)	1.52	1.03-2.27	0.037*
Male (206)	144(36.0)	62(46.3)			
High school education					
F. Sc. (396)	295(74.0)	101(75.4)	1.06	0.67-1.67	0.82
A-levels (137)	104(26.0)	33(24.6)			
Academic Years					
Pre-Clinical (213)	158(39.5)	55(41)	0.94	0.63-1.40	0.42
Clinical (320)	241(60.5)	79(59)			

Table-4: Environmental determinants of depression in medical students (n=533).

DREEM Inventory	Depression Present 399(%)	Depression Absent 134(%)	Odds Ratio	95% Confidence Interval	*p*-value
Total DREEM Score					<0.001
Negative 96	91(22.8)	5(3.7)	7.63	3.02-19.19	
Positive 437	308(77.2)	129(96.3)			
Students' Perception of Learning (SPL)					0.001
Negative 152	129(32.3)	23(17.2)	2.30	1.41-3.78	
Positive 381	270(67.7)	111(82.8)			
Students' Perception of Teaching (SPT)					0.003
Negative 102	88(22.0)	14(10.4)	2.42	1.32-4.42	
Positive 431	311(78.0)	120(89.6)			
Students' Perception of Atmosphere (SPA)					<0.001
Negative 160	141(35.3)	19(14.0)	3.30	1.95-5.60	
Positive 373	258(64.7)	115(86.0)			
Students' Academic Self Perception (SASP)					<0.001
Negative 88	79(19.7)	9(6.7)	3.43	1.67-7.04	
Positive 445	320(80.3)	125(93.3)			
Students' Social Self Perception (SSSP)					<0.001
Negative 160	141(35.0)	19(14.0)	3.30	1.95-5.60	
Positive 373	258(65.0)	115(86.0)			

DREEM: Dundee ready education environment measure

206(38.6%) were males, 327(61.4%) were females, 213(40%) were of pre-clinical and 320(60%) were of clinical academic years. Overall, 399(75%) students were found to be depressed and 134(25%) were not depressed. On the basis of PHQ-9 categories, 209(39.2%) had mild depression, 119(22.3%) moderate, 63(12%) moderate to severe, and 8(1.5%) had severe depression. Of the depressed students, 255(64%) were females and 144(36%) were males. Of the total subjects, 96(18%) had negative and 437(82%) had positive perceptions of their learning environment (Table-2).

The odds of depression was lower in age group 22-25 years (OR=0.78). The likelihood of depression was significantly higher in female gender (OR=1.52; p=0.037). High school education and the academic year of the study had no bearing on depression in medical students (Table-3).

There was significantly higher probability of depression in students who perceived their academic environment to be negative (OR=7.63; p<0.001). The likelihood of depression was considerably higher in students who had negative perception of learning environment (OR=2.30; p=0.001), teaching environment (OR=2.42; p=0.003), college atmosphere (OR=3.30; p<0.001), academic self-perception (OR=3.43; p<0.001) and social self-perception (OR=3.30; p<0.001) (Table-4).

Discussion

In the present study, the prevalence of moderate to severe depression was found to be 36%. Various studies have reported high rate of emotional stress and depression among medical students compared to the other faculties.[4-6] A survey conducted in the United States (USA) in 2007 reported prevalence of depression in medical students to be 50%.[15] Another meta-analyses of 77 studies demonstrated global burden of depression in medical students to be 28%.[16] A study conducted at a private medical college in northern India reported 35% prevalence of moderate to severe depression in undergraduate medical students.[17] Prevalence of depression among public-sector medical students at Nishtar Medical College in Pakistan was reported to be 40% and at the private-sector Ziauddin Medical University it was 60%.[18,19] Results of the present study were comparable to the one conducted by Khan et al., from a public-sector medical college in Karachi where prevalence of depression was 70%.[20]

In the present study, female gender was found to be significantly associated with depression (p=0.04). Similar findings were observed in a previous study conducted at Michigan University where prevalence of depression in females was significantly higher than the males (18% vs 9%; p =0.001).[21] Studies from medical colleges of Canada and USA also observed substantially higher frequency of depression and mental stress in the female gender.[22] Studies in Pakistan observed female preponderance of

depression as well. A research conducted at Wah Medical College reported significant association of depression with female gender (p=0.016).[23] In a study at Nishtar Medical College, depression was reported to be considerably higher in females than the males (p=0.001).[18]

In the present study, 96(18%) subjects had negative perception of the overall learning environment as observed by their total DREEM score of <100, and 91(94%) out of these 96 participants were also found to be depressed. When response of the participants in different subclasses of the DREEM inventory was analysed, it was observed that in SPL, 129(85%) out of 152 participants who had negative perceptions of the learning environment were depressed; in SPT, 88(86%) out of 102 participants having negative perceptions of teaching were depressed; in SPA, 141(88%) out of 160 participants having negative perceptions of the atmosphere were depressed; in SASP, 79(89%) out of 88 participants having negative academic self-perception were depressed; and in SSSP, 141(87%) out of 160 having negative social self-perceptions were depressed. In the current study, atmospheric, social and academic factors within the medical institution were found to be the prime determinants of depression in a significant proportion of the medical undergraduates. These findings were in concordance with a previous study on medical students in Pakistan, reporting dissatisfaction with the examination schedule and academic burden as the main factors associated with depression.[23] Another study in Nepal observed academic burden and hostel's environment as the two main sources of depression and stress in medical undergraduates.[24] Similarly, results of a study on medical undergraduates from Turkey suggested that depression was more frequently found among the students not satisfied with their medical education.[25] Learning environment has a strong impact on the behaviour, aspirations and feeling of well-being among medical undergraduates. It has been observed that disappointment from the educational milieu and negative perceptions may result in a sense of low self-esteem, profound social and personal neglect, psychosocial morbidities and complications such as addiction, aggression and suicidal attempts.[26,27]

According to the findings of the present study, out of the total 399 depressed students 91(22.8%) had negative perception of the overall learning climate as depicted from the total DREEM score of <100, and on average 116(29%) depressed students had negative perceptions regarding their social, atmospheric and academic setup. These observations suggest that in about 23% of the depressed medical undergraduates, social, atmospheric and academic factors were the major determinants of depression. The cause of depression in the remaining 77% of the depressed students cannot be identified on the basis of the DREEM inventory. However, for the well-being of the considerable proportion of the depressed medical undergraduates having negative perceptions of their learning environment, counselling facilities should be initiated and effective support system must be developed to make them more relaxed and goal-oriented. Timely identification and prompt management of this psychiatric morbidity in medical schools is required for improving the mental health of the future healers.

The current study has its limitatons. On the basis of DREEM inventory, it was unable to find the determinants of depression in 77% students who were having positive perceptions of the learning environment. Though at the time of data collection, subjects having previous history of psychiatric ailment (or on treatment for depression), epilepsy or other concomitant systemic derangements were excluded, but the cause of depression in majority of the students could still not be identified. Other possible factors predisposing to depression must be taken into account such as details of family history of the psychiatric problems, physical or anthropometric parameters, especially in females such as body mass index (BMI) and waist circumference (WC), phase of menstrual cycle in females at the time of data collection, and socioeconomic factors such as average monthly income, separation from the family or friends.

Conclusion

The prevalence of depression was found to be high among the medical students and it was associated with female gender and negative perception of the learning environment.

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