ORIGINAL ARTICLE

An Epidemiological Study on Burden of Psychological Morbidities and Their Determinants among Undergraduate Medical Students of a Government Medical College of Eastern India

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Citation

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Abstract

Background: Medical education may impose a significant amount of psychological stress and strain on undergraduates. In India, there is limited evidence regarding the magnitude of different psychological morbidities (i.e. stress, anxiety and depression) among medical undergraduates. **Aims & Objectives**: To assess psychological morbidities and their determinants among medical undergraduates. **Material and Methods**: It was a cross-sectional hospital-based analytical observational study conducted from July to November 2017. In total 327 undergraduate medical students of a government medical college of Kolkata were interviewed with a structured schedule comprising of socio-demographic, behavioural related questionnaire and DASS (Depression Anxiety Stress Scale) 21. Data were analysed by the Statistical Package for Social Sciences, SPSS (version 16). **Results:** The overall burden of psychological morbidities among medical students were 48.3% with 33.0%, 26.9% and 21.1% of them were suffering from stress, anxiety and depression related symptoms respectively. The multivariable model depression, anxiety and stress were significant predictors of each other along with sex, semester, smoking and alcohol drinking, sleep adequacy and satisfaction with own educational performance. The variables in the multivariable models were explaining 29.0% of stress, 30.8% of anxiety and 32.2% of depression. **Conclusion:** Proportion of undergraduate medical students with psychological morbidities was found to be high.

Keywords

Stress; Anxiety; Depression; Medical students.

Introduction

Psychological wellbeing is vital for every medical student, as it helps them to perform their duties more efficiently (1,2). Medical undergraduate education is quite lengthy and emotionally taxing (3,4). An optimal mental health condition of medical students enhances learning while deviation from the psychological wellbeing, i.e. excess of stress can cause health problems. Mental health deviation may result in a reduction of students' self-esteem which may result in academic underachievement (5,6). Psychological morbidity of medical students is determined by many attributes such as age, gender, year of study, academic stress, smoking status, sleep duration, resilience level, adverse life events etc.(7-14). There are very few prior studies on the burden of psychological morbidities (i.e. stress, anxiety and depression) and their determinants, especially in India (14). The recent rising trend of violence against doctors in India (15) further increases the need for evaluation of psychological morbidities of medical students as they are future budding doctors.

Aims & Objectives

To assess psychological morbidities and their determinants among medical undergraduates.

Material & Methods

It was a cross-sectional hospital-based analytical observational study conducted from July to November 2017 among medical students of a government medical college of Kolkata which is situated in eastern part of India, with a structured schedule comprising of socio-demographic, behavioural related questionnaire and DASS (Depression Anxiety Stress Scale) 21 (16). Considering the prevalence of depression in medical students in a recent study by Kunwar *et al*. (17) as 29.9% and absolute allowable error (precision) of 5, the minimum required sample size was calculated to be 322 by applying the formula 3.84*.p*.q/L2. The required sample was taken from the third, fifth and seventh semester. For the study, students of the said semesters were chosen as they were regularly visiting the community medicine department for attending classes. There were in total 750 students studying in the said semesters of the Nil Ratan Sircar Medical College and Hospital, Kolkata. Three lecture classes (one for each semester) were selected for data collection in the third week of October 2017. The data were collected within a week's time to prevent percolation of knowledge related to the responses to the questionnaire and to avoid response bias. The schedule was self-administered to the study participants. In total, 341 students (3rd semester – 137, 5th semester – 114, and 7th semester – 90) attended the said lecture classes. Among 341 students, 14 did not agree to participate, while 327 students (95.8%) (third semester-134 (97.8%), fifth semester-109 (95.6%) and seventh semester-84 (93.3%)) gave informed written consent and volunteered to participate in the study.

Operational definitions used in the study are listed next.

Psychological morbidity: In this study, only stress, anxiety and depression referred to as psychological morbidity.

Stress anxiety and depression: Those who had scored more than 14, 7 and 9 in DASS subscales respectively were considered as having stress, anxiety and depression. The severity of the said psychological morbidities was as per scoring guidelines of DASS 21 as depicted in Table 1 (16).

Sleep adequacy: Those who had reported their sleeping hours between 7-8 hours were considered having an adequate sleep (9).

Smoking: Those who reported being smoked at least once in the previous week of data collection were considered as smokers. Regarding the frequency of smoking, it was reported as perceived by the participants (regular/occasional) (18).

Alcohol drinking: Those who had reported drinking alcohol at least once in the previous week of data collection was considered as alcohol drinkers. Regarding frequency of alcohol drinking, it was reported as perceived by the participants (regular/occasional) (19).

Ethical issues: Ethical clearance of Institutional Ethics Committee (IEC) of the respected medical college was taken before conducting the study. Informed written consent of the study participants was taken before their participation. The data were collected anonymously to assure confidentiality of the data during and after collection.

Statistical Analysis: Data were analysed using IBM SPSS (version16). Firstly, a univariate analysis was done to ascertain the relationship between socio-demographic and behavioural related variables with stress, anxiety and depression. Those found to be significant were entered into multivariable logistic regression models by forced entry method. The strength of association was measured by odds ratio

(OR) at 95% confidence interval (CI). Statistical significance for all analyses was set at P < 0.05.

Results

The overall burden of psychological morbidities among medical students were 48.3%. Out of 327 study participants, 33.0% were suffering from stress while 10.4% of them were suffering from the severe or extremely severe form of stress with the mean stress score of 13.7±8.2 (range: 2-38). Those who were females and belonged to higher semester were likely to be more stressed. Similarly, 26.9% and 21.1% of them were suffering from anxiety, and depression-related symptoms with 15.9% and 4.6% of them were suffering from the severe or extremely severe form of the disease respectively with mean anxiety score 7.4±7.6 (range:0-30) and depression score 7.2±6.7 (range:0-32). Sex and semester showed a similar relationship with anxiety and depression as of with stress. (Table 1)

The Mean±SD of the age of the study participants was 20.9±1.3 years (range: 18-24years). There was a slight male preponderance (56.3%) compared to females. Almost one-fifth (18.7%) of them were smokers among which 41.7% were smoking regularly. Similarly, 14.1% of them were drinking alcohol among which 6.5% were regular drinkers. Majority of them reported their daily sleeping hours to be 6-8 hours (75.5%) with Mean±SD of 6.8±1.2 hours (range: 3-10 hours). (Table 2)

In univariate analysis stress, depression and anxiety were found out to be associated with age, gender, semester, residence, smoking, satisfaction with own educational performance, current living status, sleep adequacy and with each other. On the other hand, there was no significant association observed between alcohol drinking and pre-stated psychological morbidities though the same cannot be said for those who were both smoking and alcohol drinking. In the multivariable logistic regression analysis semester, both smoking and alcohol drinking, current living status, depression and anxiety were significant predictors of stress while both smoking and alcohol drinking, sleep adequacy, stress and depression were significant predictors of anxiety. The multivariable predictors of depression were sex, semester, stress and anxiety. Age of the study participants was not included in the final models due to its strong correlation (rho-.0.87) with the semester. The variables, which were used in the multivariable model were explaining 29.0% of stress,

30.8% of anxiety and 32.2% of depression with Predictive Accuracy Rate of 75.5%, 80.1% and 85.3% respectively. Hosmer Lemeshow test p-value for each model was>0.05 indicating model fit. (Table 3)

Discussion

The study was a facility based cross-sectional study exploring proportion of undergraduate medical students suffering from stress, anxiety and depression and their determinants.

The overall burden of psychological morbidities among medical students was 48.3% which was quite higher compared to findings of Konjengbam *et al*. (20) (28.4%) but lower compared to studies, Kiran *et al*. (21) (58.7%) and Yadav *et al*. (22) (64.0%). Out of 327 study participants, 33.0%, 26.9% and 21.1% were suffering from stress, anxiety and depression related symptoms respectively. It was similar to findings of Kunwar *et al*. (17) which reported same stress level (27.0%) and depression level (29.9%) among medical students but had reported more proportion of anxiety (41.1%). The percentage of medical students suffering from stress, anxiety and depression were quite higher in the studies conducted by Fawzy *et al*. (23), Yusoff *et al*. (24) and Moutinho *et al*. (25) compared to our findings. The variability of the results may be attributed to ethnicity, socioeconomic status, different proportion of gender in the sample and moreover due to geographical plausibility.

With the advancement of age and semester curricular load and responsibility of a medical student also increases which puts stress on one and make him/her more vulnerable to psychological morbidities. In the present study students of higher age and semester were more likely to suffer from stress, anxiety and depression. A similar finding was reported by Iqbal *et al*. (14), Moutinho *et al*. (25) and Shamsuddin *et al*. (26), which had shown students of the higher semester had more anxiety level compared to students of the lower semester. The study conducted by Basudan *et al*. (27) failed to show any such association. Other possible explanation could be, during data collection fifth and seventh-semester students had their semester examinations within a month's time that may have resulted in higher stress and other psychological morbidity related symptoms among them. Females were more likely to suffer from stress and depression-related symptoms in the present study. It was supported by the findings of Moutinho *et al*. (25), Basudan*et*

al.(27) and in concordance with the results of Schwenk *et al*.(28), which found that females are more prone to depression. It may be because women articulate depressive symptoms, even minor ones, more efficiently (29). Studies conducted by Alvi *et al*. (30) and Iqbal *et al*. (14) had shown that females are more likely to suffer from anxiety which we did not found. Students who belonged to the rural area were more likely to had anxiety and depression which was supported by the findings of Shamsuddin *et al*. (26). Smokers are more vulnerable to develop psychological morbidities (31). In the present study, smokers were more likely to suffer from all three psychological morbidities. Though the same cannot be said for the alcohol drinkers as the association between stress and anxiety with alcohol drinking was not significant despite having higher odds. It was supported by the findings of Iqbal *et al*. (14). Those who were addicted to both smoking and alcohol drinking were having significantly higher odds of having all three psychological morbidities. It may be because those having psychological morbidities are more likely to use substances for addiction and vice versa (32). In the current study, those who were not living with family had more stress. This finding was in similar to the results of Kunwar *et al*.(17) and Fawzy *et al*.(23). It may be due to those who are living with family receives parents and siblings psychological support which may have enabled them to more efficiently deal with stress and strain medical education imparts on them. Those who were not satisfied with their educational performance were more likely to had stress, anxiety and depression. This finding was supported by the conclusions of Iqbal *et al*. (14) and Fawzy *et al*. (23) whereas the study conducted by Sohail *et al*. (33), reported a significant correlation between academic performance and levels of stress which strengthens our findings. Those who had poor sleeping had significantly higher odds of having a higher level of depression and anxiety. Earlier shreds of evidence in this regard report that adequate sleeping hours is essential for maintenance of psychological well-being (7,9,10). It may have resulted in such finding. In our study stress, anxiety and depression were significant predictors of each other, similar to Moutinho *et al*. (25), whereas the study conducted by Fawzy *et al*. (23) showed depression and anxiety as a significant predictor of stress which was in concordance with our findings.

Strengths: Logistic regression was used to ascertain the strength of the association of various attributes of stress, anxiety and depression which may help in prioritising interventions.

Conclusion

The proportion of undergraduate medical students with psychological morbidities was high in the current study as one-third of them were suffering from stress while one fourth and one-fifth of them were suffering from anxiety and depression respectively.

Recommendation

There should be a regular mass screening of medical students for psychological morbidities to identify and intervene at the earliest. Students at risk should be provided with counselling services and mental support. Some modifiable risk factors of psychological morbidities emerged in the study such as smoking, alcohol drinking, sleep adequacy, study satisfaction should be more stressed upon while planning interventions.

Limitation of the study

The sample size was small. All the data were self-reported by study subjects. Data were not cross-verified. Thus, there may be over or under reporting and chances of social desirability bias cannot be overlooked. A standardized tool was not used to measure sleeping adequacy, smoking and alcohol drinking. There are probably other important determinants of psychological morbidities, i.e. resilience which we did not examine

Relevance of the study

Psychological health of medical students is multidimensional. The study found some modifiable risk factors of psychological health of medical students which will help policy makers in designing interventions in order to improve their psychological health. It will also guide future researchers in design and conduction of such kind of study.

Authors Contribution

BB conceptualized and conducted the study, and wrote the manuscript. AH and AD helped in designing the study and reviewed the manuscript. SS, AK and NM helped in statistical analysis and manuscript writing.

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Tables

TABLE 1 DISTRIBUTION OF STUDY PARTICIPANTS ACCORDING TO THEIR DASS SCORE SEVERITY, SEX AND SEMESTER (N=327)

Subscale		Normal	Mild	Moderate	Severe	Extremely severe
Stress score:		0-9	10-13	14-20	21-27	≥28
	All	219(67.0%)	46(14.1%)	28(8.6%)	20(6.1%)	14(4.2%)
	Males	135(73.4%)	26(14.1%)	11(6.0%)	4(2.2%)	8(4.3%)
	Females	84(58.7%)	20(14.0%)	17(11.9%)	16(11.2%)	6(4.2%)
	Semester 3	108(80.6%)	13(9.7%)	10(7.5%)	3(2.2%)	0(0.0%)
	Semester 5	67(61.5%)	19(17.4%)	10(9.2%)	4(3.7%)	9(8.2%)
	Semester 7	44(52.4%)	14(16.7%)	8(9.5%)	13(15.4%)	5(6.0%)
Anxiety score:		0-7	8-9	10-14	15-19	≥20
	All	239(73.1%)	12(3.7%)	24(7.3%)	21(6.4%)	31(9.5%)
	Males	142(77.2%)	12(6.5%)	11(6.0%)	7(3.8%)	12(6.5%)
	Females	97(67.8%)	0(0.0%)	13(9.1%)	14(9.8%)	19(13.3%)
	Semester 3	114(85.1%)	3(2.2%)	9(6.7%)	5(3.7%)	3(2.3%)
	Semester 5	76(69.7%)	3(2.8%)	12(11.0%)	6(5.5%)	12(11.0%)
	Semester 7	49(58.3%)	6(7.1%)	3(3.6%)	10(12.0%)	16(19.0%)
Depression score:		0-14	15-18	19-25	26-33	≥34
	All	258(78.9%)	17(5.2%)	37(11.3%)	6(1.8%)	9(2.8%)
	Males	163(88.6%)	6(3.3%)	12(6.5%)	1(0.5%)	2(1.1%)
	Females	95(66.4%)	11(7.7%)	25(17.5%)	5(3.5%)	7(4.9%)
	Semester 3	127(94.8%)	0(0.0%)	2(1.5%)	0(0.0%)	5(3.7%)
	Semester 5	83(76.1%)	7(6.4%)	12(11.0%)	3(2.8%)	4(3.7%)
	Semester 7	48(57.1%)	10(11.9%)	23(27.4%)	3(3.6%)	0(0.0%)

TABLE 2 BACKGROUND CHARACTERISTICS OF THE STUDY PARTICIPANTS (N=327)

Variable	Frequency	%
Age in completed years:		
18-19	49	15.0
20-21	167	51.1
≥22	111	33.9
Sex:		
Male	184	56.3
Female	143	43.7
Semester:		
3	134	41.0
5	109	33.3
7	84	25.7
Place of residence:		
Urban	234	71.6
Rural	93	28.4
Smoking:		
Yes	61	18.7
No	266	81.3
Alcohol:		
Yes	46	14.1
No	281	85.9

Satisfaction with own educational performance:		
Yes	106	32.4
No	221	67.6
Currently staying:		
With family	90	27.5
Hostel	217	66.4
Rent	20	6.1
Sleeping:		
Adequate	182	55.7
Inadequate	145	44.3

TABLE 3 UNIVARIATE AND MULTIVARIABLE LOGISTIC REGRESSION ANALYSIS SHOWING PREDICTORS OF STRESS, ANXIETY AND DEPRESSION AMONG MEDICAL STUDENTS (N=327)

Variables	Stress Yes=108(33.0%)			Anxiety Yes=88(26.9%)			Depression Yes=69(21.1%)		
	n(%)	OR (95%CI)	AOR (95%CI)	n(%)	OR (95%CI)	AOR (95%CI)	n(%)	OR (95%CI)	AOR (95%CI)
Age:* (Increasing)	-	1.3 (1.2-1.6)	*	-	1.4 (1.1-1.7)	*	-	1.7 (1.3-2.1)	*
Sex: (Female)	59(41.3%)	1.9 (1.2-3.1)	1.2 (0.7-2.2)	46(32.2%)	1.6 (0.9-2.6)	-	48(33.6%)	3.9 (2.2-6.9)	4.4(2.1-9.4)
Semester: (Increasing)	-	1.4 (1.2-1.6)	1.2 (1.0-1.4)	-	1.4 (1.2-1.6)	1.1 (0.9-1.4)	-	1.8 (1.5-2.2)	1.7(1.3-2.1)
Residence: (Rural)	37(39.8%)	1.5 (0.9-2.5)	-	33(35.5%)	1.7 (1.1-3.0)	1.3 (0.7-2.5)	31(33.3%)	2.5 (1.4-3.4)	1.9(0.9-3.9)
Smoking: (Yes)	27(44.3%)	1.8 (1.0-3.2)	-	35(57.4%)	5.4 (2.9-9.7)	-	20(32.8%)	2.1 (1.1-4.0)	-
Alcohol drinking: (Yes)	20(43.5%)	1.7 (0.8-3.2)	-	17(37.0%)	1.7 (0.8-3.3)	-	9(19.6%)	0.8 (0.4-1.9)	-
Both smoking and alcohol drinking: (Yes)	13(68.4%)	4.8 (1.8-13.1)	3.4 (1.1-11.0)	12(63.2%)	5.2 (1.9-13.7)	3.5 (1.1-10.7)	8(42.1%)	2.9 (1.1-7.6)	2.5 (0.7-9.1)
Study satisfaction: (No)	86(38.9%)	2.9 (1.6-5.2)	1.7 (0.9-3.2)	65(29.4%)	2.0 (1.1-3.5)	1.3 (0.6-2.5)	53(24.0%)	2.1 (1.1-3.9)	1.6 (0.7-3.7)
Living with family: (No)	89(37.6%)	2.2 (1.2-3.9)	2.0 (1.0-3.8)	67(28.3%)	1.2 (0.7-2.2)	-	56(23.6%)	1.8 (0.9-3.5)	-
Sleeping: (Inadequate)	56(38.6%)	1.5(0.9-2.5)	-	53(36.6%)	2.4 (1.4-3.9)	1.9 (1.1-3.4)	40(27.6%)	2.0 (1.1-3.4)	1.2 (0.6-2.6)
Stress: (Yes)	-	-	-	52(48.1%)	4.7 (2.8-7.9)	2.7 (1.5-4.8)	46(42.6%)	6.3 (3.5-11.2)	3.5 (1.7-7.0)
Anxiety: (Yes)	52(59.1%)	4.7(2.8-7.9)	2.6(1.4-4.7)	-	-	-	43(48.9%)	7.8 (4.3-14.0)	3.9 (1.9-8.0)
Depression: (Yes)	46(66.7%)	6.3 (3.5-11.2)	3.0 (1.5-5.9)	43(62.3%)	7.8 (4.3-14.0)	4.2 (2.1-8.2)	-	-	-
Negelkerke r square:	-	-	.290	-	-	.308	-	-	.322
Hosmer Lemeshow:	-	-	.155	-	-	.147	-	-	.119
PAR	-	-	75.5%	-	-	80.1%	-	-	85.3%

Not included in the models due to Multicollinearity with semester

OR-odds ratio, AOR- adjusted odds ratio, CI-confidence interval, PAR-predictive accuracy rate