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Evaluation of depression, anxiety and stress levels among medical students in Bihar: a questionnaire study

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Abstract

Background: Medical College is recognized as a stressful environment that often exerts a negative effect on the academic performance, physical health and psychological wellbeing of the student. **Objective:**The objective of the study was to assess the depression, anxiety and stress levels among the medical students by using DASS.
Materials and Methods:This study was carried out in the Department of Physiology, Patna Medical College, Patna, Bihar, India from March 2019 to January 2020, after taking the approval of the protocol review committee and institutional ethics committee. After taking informed consent detailed history was taken from the participant.They were informed about the anonymous and voluntary nature of participation in the study without any undue fear, stigma, or adverse documentation and were contacted during their free time. A previously validated and standardized survey instrument, Depression Anxiety Stress Scale (DASS 21), was used to collect information on depression, anxiety, and stress. **Results:** A total of 200 students participated in the study giving a response rate of 96%. The overall mean age of students was 20.69 (standard deviation=1.96) years. It was also found that 33.5% had a family history of chronic non-communicable disease; 11.5%further mentioned that there was a family history of chronic mental illness while 24% of students had suffered with some medical conditions such as typhoid, malaria, pneumonia, and hospitalization due to injury in the past. It was found that 50(25%), 70(35%), and 80(40%) medical students were affected by symptoms suggestive of depression, anxiety, and stress, respectively. Some students were affected by >1 emotional state. It was observed on bivariate analysis that higher proportion of students with anxiety had a history of some medical condition and this was found to be statistically significant (p<0.05). Similarly, family history of chronic noncommunicable disorder was significantly (p<0.05) associated with stress and family history of mental illness with depression only. The correlation between depression, anxiety, and stress and it was found that they were highly correlated with each other. The correlation coefficient value between depression and anxiety was 0.70, depression and stress was 0.71, and anxiety and stress was 0.76. **Conclusion**: It is noted that emotional distress is common among medical students, and there is an urgent need for attention, support, and personalized counselling.
Keywords: Depression, Anxiety, Stress, Medical students

Introduction

Mental disorders are often been neglected because of its non-specificity in diagnosis, indefinite clinical presentations, long term and varied treatment, various myths and belief systems associated with social stigma.[1]

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Around 20% of the world's children and adolescents have mental disorders or problems.[2] Medical school is recognized as a stressful environment that often has a negative effect on students' academic performance, physical health, and psychosocial well-being.[3] More than half of the medical undergraduate students were found to be affected by depression, anxiety and stress.[4] Medical profession is one of the top professional courses chosen because of its esteemed place and financial security in the Indian society. The students usually experience the burden of vast syllabus, high level of competition, inability to cope with the high

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expectations of parents after joining the course. This creates stress in them which will have a negative impact on their mental health status leading to sleep deprivation, reduced concentration, lack of confidence in handling patients, loss of self-esteem, anxiety, depression, interpersonal conflict, substance abuse, suicidal attempts etc.

Medical education can be quite stressful and studies all over the world have consistently shown a high prevalence of depression in medical students.[5]In India, the prevalence of depression was around 39%. It was observed that the prevalence of provisionally diagnosed depressive disorder and major depressive disorder in medical students was 21.5% and 7.6%, respectively.[6] Academic performance had a significant association with depression in medical students. The stigma associated with poor academic performance may be a contributing factor. On the other hand, students with excellent academic performance maybe facing pressures due to the competitive nature of medical education.[7] It is no surprise that mental health of medical students in India as an area of research domain has attracted the second highest attention of the faculty in medical colleges of country after medical education, learning process, and evaluation.[8] With this background, a study was undertaken to assess the prevalence of depression, anxiety, and stress among medical students enrolled in a Patna Medical College, Patna, Bihar, India.

Materials and Methods

This study was carried out in the Department of Physiology, Patna Medical College, Patna, Bihar, India from March 2019 to January 2020, after taking the approval of the protocol review committee and institutional ethics committee. After taking informed consent detailed history was taken from the participant.They were informed about the anonymous and voluntary nature of participation in the study without any undue fear, stigma, or adverse documentation and were contacted during their free time.

Methodology

A previously validated and standardized survey instrument, Depression Anxiety Stress Scale (DASS 21), was used to collect information on depression, anxiety, and stress.[9, 10] Additional information was also collected on sociodemographic, academic profile, and personal characteristics of students. Subjective (self) assessment of ability to cope with syllabus and academic performance on a scale of 1–10 points, satisfaction with body image, admission in current medical college, and global satisfaction with life was

also assessed. Self assessment scale from 1 to 10 points was classified into low(1–4), medium(5–7), and high(8–10) score. DASS (21 item) is a short scale that allows simultaneous assessment of the three emotional states of depression, anxiety, and stress and each domain contains 7 items, divided into subscales with similar content. The depression scale assesses dysphoria, hopelessness, and devaluation of life, self-deprecation, lack of interest/involvement, anhedonia, and inertia. The anxiety scale assesses autonomic arousal, skeletal muscle effects, situational anxiety, and subjective experience of anxious affect. The stress scale is sensitive to levels of chronic nonspecific arousal. It assesses difficulty relaxing, nervous arousal, and being easily upset/agitated, irritable/over-reactive, and impatient. Respondents were asked to document on a 4-point severity/frequency scales to rate the extent to which they have experienced each state over the past week. The scale is as follows: did not apply to me at all = 0; applied to me to some degree or some of the time = 1; applied to me to a considerable degree or a good part of time = 2; and applied to me very much or most of the time = 3. Scores for depression, anxiety and stress are calculated by summing the scores for the relevant items and analyzed as per guidelines. The tool is easy to apply in both clinical and nonclinical settings and suitable for use in different age groups including medical students.

Statistical analysis

The data were analyzed using statistical software, SPSS (ver. 20.0) (IBM Inc, Armonk, New York, USA). Descriptive statistics and bivariate and regression analysis were carried out to find association and correlation and considered significant at $p < 0.05$. The internal consistency, i.e., Cronbach's alpha value was 0.87 that was suggestive of high reliability.

Results

A total of 200 students participated in the study giving a response rate of 96%. The profile of the study sample was predominantly male (60%); hosteller (69%) with 60.5% of students having one sibling. Nearly 25.5% and 33.5% of students reported having ever smoked or consumed alcohol, respectively. The overall mean age of students was 20.69 (standard deviation=1.96) years. Table 1 depicts sociodemographic profile of study participants. It was also found that 33.5% had a family history of chronic noncommunicable disease; 11.5% further mentioned that there was a family history of chronic mental illness while 24% of students had suffered with some medical conditions such as typhoid, malaria, pneumonia, and hospitalization due to injury

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in the past. It was found that 50(25%), 70(35%), and 80(40%) medical students were affected by symptoms suggestive of depression, anxiety, and stress, respectively. Some students were affected by >1 emotional state. It was observed on bivariate analysis that higher proportion of students with anxiety had a history of some medical condition and this was found to be statistically significant (p<0.05). Similarly, family history of chronic noncommunicable disorder was significantly (p<0.05) associated with stress and family history of mental illness with depression only.Table 2 shows association of academic variables of students with depression, anxiety, and stress, and it was found that enrollment batch and ability to cope with syllabus were statistically associated with depression, anxiety, and stress (p<0.05)

Table 3 depicts additional personal details of medical students affected by emotional state. It was noted that 10% reported parental conflict; 17.5% were "always" fearful about future life; 19.5% had poor relationship with family members; 25% were unsatisfied with their body image; and 20% were globally dissatisfied. It was found that satisfaction with body image and global satisfaction with life was statistically (p<0.05) associated with depression and anxiety while relationship with family members was statistically (p<0.05) associated with depression only. Higher proportion of student with depression had fair (poor) relationship with their respective families. Subjective (self) assessment of ability to cope with medical syllabus was inversely but statistically associated (p<0.01) with depression and anxiety, i.e., as the ability to cope with syllabus increases, the probability of occurrence of depression and anxiety decreases.As shown in Table 4, one unit improvement in ability to cope with syllabus results in reduction of 1.32 units in depression and 0.74 units in anxiety.We further studied the correlation between depression, anxiety, and stress and it was found that they were highly correlated with each other. The correlation coefficient value between depression and anxiety was 0.70, depression and stress was 0.71, and anxiety and stress was 0.76.

Table 1: Socio-demographic profile of study participants(n=200)

Variable	N	(%)
Gender		
Male	120	60
Female	80	40
Religion		
Hindu	164	82
Others	36	18
Residence		
Hostel	138	69
Dayscholar	62	31
Number of siblings		
One	121	60.5
Atleast two	79	39.5
Students who have ever smoked		
Yes	51	25.5
Students who have ever consumed alcohol		
Yes	67	33.5

Table 2: Academic profile of study participants affected by the psychological state

Variable	Total (n=200), n (%)	Depression (n=50), n (%)	Anxiety (n=70), n (%)	Stress (n=80), n (%)
Enrollment batch (year of college admission)				
I[st]year	53 (26.5)	18 (38)*	26 (37.14)[#]	28(35)[a]
II[nd]year	51 (25.5)	13 (26)*	15 (21.42)[#]	20(25)[a]
IIIrd year	50 (25)	11 (22)*	14 (20)[#]	17 (21.25)[a]
IV[th]year	46 (23)	8 (16)*	15 (21.42)[#]	15 (18.75)[a]
No of attempts to join MBBS				

First attempt	80 (40)	21(42)	27 (38.57)	28 (35)
At least 2 attempts	120 (60)	29 (58)	43(61.43)	52 (65)
Reason to join MBBS				
Personal choice	177 (88.5)	46 (92)	62 (88.57)	69 (86.28)
Parents' pressure	23 (11.5)	4 (8)	8 (11.43)	11 (13.75)
Awareness of vastness of medical course before joining MBBS				
Yes	141 (70.5)	33 (66)	51 (72.86)	59 (73.75)
No	59 (29.5)	17 (34)	19 (27.14)	21 (26.25)
Number of supplementary examinations				
None	173 (86.5)	44 (88)	62 (88.57)[#]	73 (91.25)
At least one	27 (13.5)	6 (12)	8 (11.43)[#]	09 (8.75)
Satisfaction with regard to admission in this college				
Satisfied	163 (81.5)	37 (74)	55 (78.57)	63 (78.75)
Unsatisfied	37 (18.5)	13 (26)	15 (21.42)	17 (21.25)
Satisfaction with regard to MBBS as a professional carrier				
Satisfied	187 (93.5)	46 (92)	65 (92.86)	75 (93.75)
Unsatisfied	13 (6.5)	4 (8)	5 (7.14)	5 (6.25)
Subjective (self) assessment of ability to cope with medical syllabus on a scale of 1-10 points				
1-4 (low)	24 (12)	4 (8)*	6 (8.57)[#]	09 (11.25)[a]
5-7 (medium)	128 (64)	37 (74)*	43 (61.43)[#]	51 (63.75)[a]
8-10 (high)	48 (24)	9 (18)*	21 (30)[#]	20 (25)[a]
Subjective (self) assessment of academic performance on a scale of 1-10 points				
1-4 (low)	38 (19)	12(24)	15 (21.43)	18 (22.5)
5-7 (medium)	132 (66)	30 (60)	43 (61.43)	51(63.75)
8-10 (high)	30 (15)	8 (16)	12 (17.14)	11 (3.75)

Test applied: chi-square test *,#,[a] $P<0.05$

Table 3: Personal profile of study participants affected by emotional state

Variable	Total n (%)	Depression	Anxiety	Stress
	n =200(%)	n =50(%)	N=70 (%)	N=80 (%)
History of parental conflict				
Yes	20 (10)	5 (10)	7 (10)	8 (10)
Fear of future life				
Always	37 (17.5)	11 (22)	11 (15.71)[#]	10 (12.5)
Sometimes	136 (68)	36 (72)	50 (71.43)[#]	57(71.25)
Never	29 (14.5	3 (6)	9 (12.86)[#]	13 (16.25)
Relationship with friends				
Strong	96(48)	22 (44)	31 (44.28)	44(55)
Fair	104(52)	28 (56)	39 (55.72)	36(45)
Relationship with family				
Strong	161 (80.5)	34 (68)*	53 (75.71)	65 (81.25)
Fair	39 (19.5)	16 (32)*	17 (24.29)	15 (18.75)
Satisfaction with body image				

| Satisfied | 150 (75) | 36(72)* | 55 (78.57)# | 63 (78.75) |
| Not satisfied | 50(25) | 14 (28)* | 15 (21.43)# | 17 (21.25) |

Test applied: chi-square test [a]$P<0.05$

Table 4: Ordinal regression analysis of association of depression,anxiety,and stress with sociodemographic, academic, and personal profile of medicalstudents

Variable	Estimate Significance	Significance	95%CI
Depression			
Subjectiveassessment of ability to cope with medicalsyllabus	-1.32	0.001	−1.95-−0.61
Anxiety			
Subjective assessment of ability to cope with medicalsyllabus	−0.74	0.01	−1.20-−0.18

CI: Confidence interval, LL: Lower limit, UL: Upper limit

Discussion

This descriptive study using DASS-21 scale was suggestive of high prevalence of depression (25%), anxiety (35%), and stress (40%) among medical students enrolled in Patna Medical College, Patna, Bihar, India. The predictors such as low ability to cope with syllabus and newly entrant students were significantly (p < 0.05) associated with the emotional distress. This study also reported protective factors such as strong relationship with family members, negative history of medical condition, satisfaction with body image, and global satisfaction with life. However, a recent large sample survey in southern part of India reported an overall prevalence of depression of 15.9% among general population.[11] In a similar study from Brazil using DASS scale, 34.6%, 37.2%, and 47.1% of medical students suffered from depression, anxiety, and stress, respectively.[12] A study from Turkey found that 27.1% of students were depressed, 47.1% from anxiety, and 27% students were stressed. In a study from Nepal, depression was reported to be 29.9%, anxiety 41.1%, and stress 27% among medical students.[13] A study based in the United States found 24% of medical students to be depressed while another study from the US reported 12% of medical students to be diagnosed with probable major depression using DSM III criteria.[14] In a study from Egypt, 43.9% of students were suffering from anxiety.[15] Similar alarming statistics have been corroborated by our study also. Studies conducted in various regions of India reflect diverse situation depending on the use of study instruments. In a study from Bhubaneshwar (Odisha), the prevalence of depression, anxiety, and stress among medical students was 51.3%, 66.9%, and 53%, respectively, using DASS scale.[16] Another study reported that 39.44% of students suffered from depression, 66.05% from anxiety, and 51.37% from stress.[17] A Jodhpur (Rajasthan)-based study found that 57.98% of students depressed and 47.41% suffered from anxiety.[18]Another Delhi-based study found the overall prevalence of provisionally diagnosed depressive and major depressive disorders among medical students to be 21.5% and 7.6%, respectively.[19]On the contrary, some studies conducted two decades ago have found little or no evidence of stress among medical students.[20,21]On joining medical college, students embark their professional journey with high expectations and are loaded with lots of new information to be crammed which at times become difficult to process. The students leave the protected, pampered, and very supportive environment of their family and come to stay in hostel under highly competitive environment. Quince et al. performed a longitudinal study at a UK medical school and found a prevalence of depression ranging from 5.7% to 10.6% among students in the basic years and 2.7% to 8.2% in students from clinical stages of the course.[23]Further, there was no significant difference of emotional state between males and females in our study. In our urban-based study, 22.5% of students were unsatisfied with their body image which is higher than another study conducted at Rohtak, Haryana (13.5%), with a predominantly rural flavor.[24] The content of MBBS subject in medical colleges of India is based on global best practices, and course duration is of four-and-half years followed by 1-year internship. The students are systematically and in structured way exposed to different subject streams (preclinical, paraclinical, and clinical) through processes prescribed under regulatory body with student to keep record of daily activity/learning in a log book followed by formative and summative evaluation.[25] It is no surprise that India is one of the popular destinations of medical, transplant, reproductive, and health tourism in the

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world, and a substantial proportion of renowned doctors working in developed country have roots in this great nation.[26,27]It could be partly attributed to rigor of professional training and the quality of learning environment in medical colleges of India. The development and growth potential of an individual is directly correlated with the depth of knowledge, positive attitude, and diverse skills she/he possesses and demonstrates whether at undergraduate or higher level.[28] It can be though attributed to early start and purposeful planning but also indicating a case scenario of intense peer pressure, uncertain future environment, rising stress, and anxiety.

Conclusion

The present study concluded that medical students were found under under strain are either unaware of their situation or reluctant to seek help. High-risk students found in our study were provided personal and confidential counselling under additional supervision of mental health expert.

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