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Depression, Anxiety and Stress and their associated factors among Undergraduate Medical Students: A Cross Sectional Study

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ABSTRACT

Background

Medical students are subjected to a unique set of stressors that can significantly impact their mental health. Due to the strenuous course of MBBS, which lasts for five years, characterized by rigorous course work, long hours of study duration and the emotional toll of clinical training often leads to elevated levels of stress, anxiety and depression among the students. With these viewpoints, this study aimed to assess the prevalence of depression, anxiety and stress and its associated factors among undergraduate medical students in Lucknow.

Material and Method

A cross-sectional study was conducted on 330 medical students to investigate the prevalence and risk factors for depression in a private medical college and hospital in North India, utilising a random sampling method. Along with the pre-tested questionnaire which was validated by the pilot study done on 30 students, the Depression Anxiety Stress Scale (DASS) was used as study tool to assess the level of depression and anxiety among the study population. Collected data was analysed statistically by simple proportions and the chi-squared test.

Results

The overall prevalence of abnormal levels of stress was 68.5% followed by depression which had a prevalence of 52.7%. In terms of severity stress was the most prevalent condition with more than a quarter (28.20%) of the students presenting with severe and very severe scores compared depression (19%).The prevalence of depression and anxiety was higher among final year students (55% and 73% respectively) and first year medical students (54%, 76%) respectively. A significant association was found between the prevalence of depression in medical students with family history of mental illness.

Conclusion

Prevalence of depression is higher among medical undergraduate students. This study suggests that there are certain risk factors other than academic stressors which predispose medical students to psychological morbidity such as anxiety and depression.

Keywords: Depression, Anxiety, DASS, undergraduate medical students

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INTRODUCTION

Medical students are subjected to a unique set of stressors that can significantly impact their mental health. Various public and private medical colleges provide medical degrees with the goal of producing and training highly qualified medical professionals who will improve the healthcare sector. The vast and intricate syllabus, intense study hours , demanding schedule, rigorous clinical training often leads to elevated levels of stress, anxiety and depression.[1,2] Mental health disorders are characterized by a clinically significant alteration in an individual's emotional regulation, cognitive processes or behaviour. [3] Medical students are at higher risk of physical and mental health issues than non-medical students due to the greater exposure to academic stress. [4] According to the National Institute of Mental Health, depression is a mental illness characterized by thoughts of suicide, changes in appetite, feelings of hopelessness and worthlessness as well as a loss of interest in activities. [5] Anxiety as per DSM-5 is excessive worry ocurring more days than not for at least 6 months, about a number of events or activities (such as work performance). [6] Stress is defined as how a person physically and mentally responds to situations that are considered difficult or challenging. [7]

As per WHO, Approximately 970 million individuals worldwide or 1 in every 8 persons, were found to suffer from a mental illness in 2019. The most prevalent conditions were anxiety and depressive disorders. [8] The COVID-19 pandemic contributed significantly to the number of individuals suffering from anxiety and depression disorders in 2020. According to preliminary estimates, anxiety and major depressive disorders have increased by 26% and 28%, respectively, in just a single year. [9] The WHO estimates that the burden of mental health problems in India is 2,443 disability-adjusted life years (DALYs) per 10,000 people, and the age-adjusted suicide rate per 100,000 population is 21.1. [10] In 2017, 197·3 million people had mental disorders in India, including 45·7 million with depressive disorders and 44·9 million with anxiety disorders. The load of prevalence of mental health disorders is significantly higher in recent years depicting the importance of stress management and positive coping mechanisms should be focused to prevent suicides and a better productivity among students.[11]

Failure to detect these disorders unfortunately leads to increased psychological morbidity with unwanted effects on the professional and personal livelihoods of affected persons. [12] Depression in medical students can have a detrimental impact on patient care, productivity, quality of life, and learning. [13] Medical students are a valuable asset for our future, and therefore it is crucial to identify depression early and take the appropriate interventional steps to stop its negative effects from developing and impacting an individual's professional and educational goals. Nonetheless, in India, depression among medical students remains an under-reported public health issue. Numerous studies from many Western countries and other regions of the world have documented high rates of psychological illness among medical students, including anxiety and depressive symptoms. [14,15] Studies on Indian medical students are lacking even though India has one of the largest number of medical colleges and enrolled medical students. The prevalence of depression among medical students varies depending on age, gender, year of study and the scale used to measure depression. [16,17]

Numerous factors, including alcohol and drug addiction, familial issues, a history of depression in the family, and living away from home, are linked to the high occurrence of depression among medical students. In order to provide medical students with counseling and rehabilitation, it is necessary to measure their levels of anxiety, depression, and related conditions. With these perspectives, we conducted the present study with the following objectives: (a) To assess the prevalence of depression and anxiety among medical students at different stages of education. (b)To find association between depression, anxiety and its inducing factors.

Methodology

A cross-sectional study was conducted during the period of August 2023 to January 2024 in a private

medical college and hospital in North India. 150 students are enrolled at this institution yearly for M.B.B.S and students from all four years of study were eligible to take part in this study. The minimum sample size was calculated to be 82 participants per year of study using the formula $n = Z^2_{1-\alpha/2} \times P \times Q / d^2$, where the prevalence of depression among medical students was taken as 71% [18] based on prior literature, with 9% absolute precision for a 95% Confidence Interval. Finite population correction for 600 students was applied, yielding a final sample size of 330 total participants for stratified multistage random sampling.

All medical students who had been enrolled in the institution for more than six months and were free of physical illnesses were eligible to take part in the study. A self-administered questionnaire was given out to students who were randomly selected from every class from first to final year. The study was done with the persual of the head of the institution and then informed written consent was taken from those selected to participate. The purposes of the study were explained to participants before initiating the study and participants were assured of confidentiality. After an instructional session, the students were directed to fill out the questionnaire in class and return it to the study team on the same day. In order to protect their anonymity, the respondents were requested not to write their names or any other identifying information on the questionnaire. There were no potential risks to the participants in this study as there were no interventions involved. The questionnaire was not applied shortly before examinations because anxiety was noted to be the highest in pre-exam periods. The questionnaire consisted of demographic variables and questions on factors associated with depression and anxiety. Age, gender, and characteristics like drug and alcohol addiction, family issues, a history of depression in the family, and prolonged stays away from home were considered demographic variables. , Family history of depression was assessed based on earlier diagnosis among first or second degree relatives.

In addition, anxiety and depression symptoms were assessed with Depression Anxiety and Stress Scale (DASS) in the same questionnaire. DASS is a pretested, validated, standardized, self-administered survey instrument with a total of 42 questions. Each question was scored on 4-point scale ranging from 0 to 3. 0-Did not apply to me at all, 1-Applied to me to some degree, or some of the time, 2-Applied to me to a considerable degree, or a good part of time, 3-Applied to me very much, or most of the time. Depression was graded based on scores as normal (0-9), mild (10-13), moderate (14-20), severe (21-27), and extremely severe (28+). Anxiety was graded based on scores as normal (0-7), mild (8-9), moderate (10-14), severe (15-19), and extremely severe (20+).Stress was graded based on scores as normal (0-14), mild (15-18), moderate (19-25), severe (26-33), and extremely severe (34+). Data were entered into Microsoft Excel and analysed using SPSS statistical software. Nominal data was expressed in terms of proportion or percentages. The Chi-squared test was used to investigate the association between depression, anxiety and selected variables. The study was approved by the Institutional Ethical Committee of T.S. Misra Medical College and Hospital, Lucknow, India (Ref No. TSMMC&H/ IEC/July 23/ 94/40).

Results

A total of 330 medical students recruited in the current study belong to four different batches as per their year of admission. Study participants included 74, 94, 111, and 51 undergraduate students from first, second, third and fourth year respectively. The majority (87.9%) of the participants were less than 20 years of age and more than half (57.3%) of the students were female. 89% participants were staying in the hostels and third year were the largest group (33.6%) . Complete demographic data are presented in Table 1.

Table 1: Demographic characteristics of study participants: (N= 330)

Characteristics	N	%
Age (in years)		
≤ 20	290	87.9
>20	40	12.1
Sex		
Male	141	42.7
Female	189	57.3
Residence		
Hostellers	294	89
Day scholars	36	11
Year of Study		
First year.	74	22.4
Second year	94	28.5
Third year	111	33.6
Final year	51	15.5

According to the criteria of DASS, the overall prevalence of abnormal levels of stress was 68.50% (stress scores ≥15) followed by depression 52.70% (depression scores ≥10) and anxiety 44.20% (anxiety scores ≥8). In terms of severity stress was the most prevalent condition, as more than a quarter of the students presented with severe and very severe scores in this aspect (28.20%, stress scores ≥26) compared to that of depression (19%, depression scores ≥21) and anxiety (17.50%, anxiety scores ≥15). The distribution of participants according to severity based on DASS scores is depicted in Figure 1.

Fig. 1: Prevalence (%) of Depression, Anxiety and Stress across different severity levels

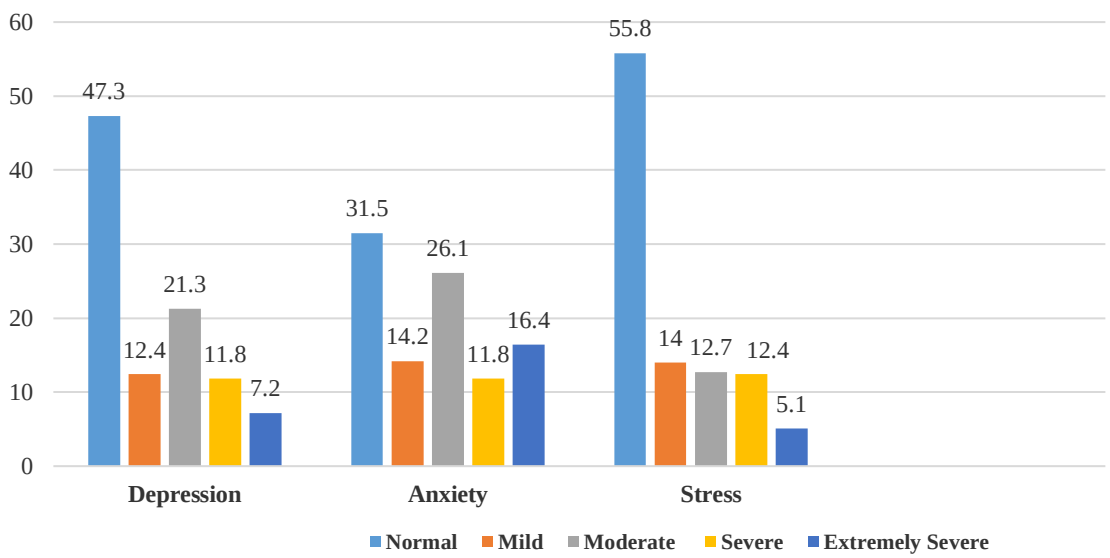

Figure 1: Prevalence (%) of Depression, Anxiety and Stress across different severity levels among study population

The prevalence of depression and anxiety was higher among final year (55%, 73%) and first year medical students (54%, 76%) respectively (Table 2).

Table 2: Prevalence of depression and anxiety according to year of study:

		1st Year N (%)	2nd year N (%)	3rd year N (%)	4th year N (%)	Total
Depression	Normal	34 (46)	47 (50)	52 (47)	23 (45)	156
	Mild	14 (19)	15 (16)	11 (10)	08 (16)	48
	Moderate	13 (18)	19 (20)	22 (20)	09 (17)	63
	Severe	10 (13)	08 (9)	17 (15)	04 (8)	39
	Extremely severe	03 (4)	05 (5)	09 (8)	07 (14)	24
	Total	74	94	111	51	330
Anxiety	Normal	18 (24)	37 (39)	35 (32)	14 (27)	104
	Mild	12 (16)	11 (12)	13 (12)	11(22)	47
	Moderate	16 (22)	27 (28)	35 (31)	08 (16)	86
	Severe	11 (15)	09 (9)	12 (11)	07 (14)	39
	Extremely severe	17 (23)	12 (12)	16 (14)	11(21)	54
	Total	74	94	111	51	330

A significant association was found between depression and medical students with family history of mental illness (Table 3),

Table 3: Association between depression and its inducing factors:

Variables		Depression		$\chi 2$	p-value
		Present [N=174]	**Not present [N=156]**		
Age (years)	≤ 20	158	132	2.98	0.21
	>20	16	24		
Sex	Male	73	68	3.73	0.19
	Female	101	88		
Year of study	First prof.	40	34	1.93	0.97
	Second prof.	47	47		
	Third prof.	59	52		
	Final prof.	28	23		
Any Substance use	Yes	06	05	0.58	0.62
	No	168	151		
Family problems	Yes	22	21	2.81	0.83
	No	152	135		

Staying in hostel	Yes	160	140	4.08	0.08
	No	14	16		
Family history of mental illness(es)	Yes	23	18	9.504	0.00*
	No	151	138		

While anxiety was significantly associated with the year of study and accommodation style of study participants. (Table 4)

Table 4: Association between anxiety and its inducing factors:

Variables		Anxiety		$\chi 2$	p-value
		Present N=226	**Not Present N= 104**		
Age(years)	≤ 20	204	86	1.89	0.91
	>20	22	18		
Sex	Male	84	57	1.53	0.82
	Female	142	47		
Year of study	First prof.	56	18		
	Second prof.	57	37	24.33	*0.01
	Third prof.	76	35		
	Final prof.	37	14		
Any Substance use	Yes	07	04	1.10	0.89
	No	219	100		
Family problems	Yes	28	15	0.66	0.95
	No	198	89		
Staying in hostel	Yes	207	93	10.86	*0.02
	No	19	11		
Family history of mental illness(es)	Yes	27	14	0.70	0.95
	No	199	90		

DISCUSSION

The study found that a high proportion of students experienced depression, anxiety and stress in a medical college. A high prevalence of depression, anxiety and stress could affect their professional training, and the desired objectives of the training might not be met. The prevalence of depression is 52.7% among medical students in the current study. Previous studies reported prevalence of depression among undergraduate medical students to be ranging from 32% to 71.25%. [18-22] A systematic review conducted on mental health of medical students in India states that the prevalence rate of depression varied from 8.7% to 71.3%, while the pooled prevalence rate of depression from 16 studies (*n* = 3882) was 39.2% [23]. Some studies have shown lower prevalence of depression among undergraduate medical students.[24,25] This difference may be due to different study area, difference in the methodology adopted, instruments used for the screening, different cut off values used for the definition of depression and different socioeconomic background of the

students.

This study showed that prevalence of depression was more among final year and 1st year medical students similarly to the findings of other studies.[16,26] Similar to our study findings, the study by other authors in Northern India found students of 1st year had more proportion of depressive symptoms.[26] Higher semester batches in our study may have more depressed symptoms because of information overload, an increased workload from exams, and pressure to succeed as a doctor in the future, which leaves less time for socializing and recreation. Students encounter a new atmosphere and a great deal of academic stress when they start medical school. This might be a factor in the greater rate of depression observed in this study's first-year medical students. However, a different study revealed that the prevalence is much higher among second-year medical students.[25] Our assessment of the student's mental health revealed a concerning picture. Following this assessment, individuals who were determined to have likely depression, received counselling and were urged to see a psychologist and counsellor. We used a self-reporting subjective depression screening scale, thus the results could be readily exaggerated or understated by the person filling it out. Therefore, it can be assessed by further studies in depth by quantitative & qualitative methods.

Current study found a significant association between depression and medical students with family history of mental illnesses. On the other hand, some studies revealed no significant correlation between depression and a family history of psychiatric disorders. [25,27] Gender did not have any significant association with prevalence of depression in this study. The results of a previous Indian study are similar to this.[27] There is no statistically significant difference found between prevalence of depression among day scholars and hostelers in current study. This finding is similar to many other studies [25,28]

CONCLUSION

The present study found that the prevalence of depression and anxiety is higher among medical students. First year and final year medical students are more depressed compared with other year's students. This study suggests that there are certain risk factors other than academic stressors which predispose a medical student to psychological morbidity such as anxiety and depression. Hence there is a need for early screening and psychiatric counselling of this susceptible population.

LIMITATIONS

The present study was based on results from a self-administered questionnaire, hence reporting bias cannot be totally excluded. The study was undertaken in only one medical college, which limits the generalization of the results. As the study was cross-sectional, the cause-effect relationship is not substantial. Lastly, all risk factors could not be accounted for. Future longitudinal studies involving larger samples across several medical colleges are necessary to ascertain the prevalence and different causal factors.

RECOMMENDATIONS

1. There is a need for the regular screening and counselling services to be made available to the students in the medical colleges for the early diagnosis and further control of this morbidity.
2. Further studies need to be conducted in future to identify socio-demographic factors and other factors related to academic curriculum in medical colleges so that remedial measures can be suggested at an earliest, otherwise not only medical fraternity will suffer but also society would be affected on a large scale.

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