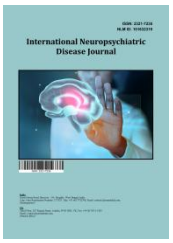

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Assessment of Symptoms of Depression, Anxiety & Stress among Medical Students

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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ABSTRACT

Aims: To Assess Depressive, Anxiety & Stress related symptoms and their correlation with sociodemographic factors amongst recently enrolled medical students.
Study Design: Cross sectional study.
Place and Duration of Study: Recently enrolled 275 Medical students attending University between June 2022 and September 2022.
Methodology: Study conducted among recently enrolled 275 Medical students. After taking their prior informed consent through online form shared through WhatsApp group, they were given to fill online questionnaire to collect sociodemographic factors in English made using PsyToolkit software. It also contains Depression Anxiety Stress Scale (DASS 21), which was used to collect information on depressive, anxiety, and stress related symptoms.

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Results: Prevalence of depressive symptoms is 68.4%, anxiety symptoms are 78.2% and stress related symptomsis 33.1% among medical students. Depressive, anxiety and stress related symptoms were statistically significantly associated with peer and family pressure to join study-stream (p-value of <.01 for all three) and history of mental health issues in family (p-value=.01 for all three). In addition, depressive symptoms were statistically significantly associated with poor peer-relationship (p-value=.01) and unsatisfaction regarding admission (p-value=.04); and stress related symptoms was statistically significantly associated with unsatisfaction regarding admission (p-value=.03).

Conclusion: Prevalence of depressive, anxiety & stress related symptoms among recently enrolled medical students are high providing insight into needed improvement of psychological wellbeing in them; which could potentially have a positive impact upon their quality of life & patient care.

Keywords: Anxiety; psychological stress; depression; medical students.

1. INTRODUCTION

The medical profession has been considered a very desirable profession in Indian society due to its economic stability and potential for growth [1]. Medical colleges are responsible for ensuring that medical students acquire the necessary knowledge and skills before accepting professional obligations. This is done in order to prepare medical students for a personally rewarding and socially meaningful career. Unfortunately, some elements of the learning process have unintended detrimental impacts on the psychological and physical well-being of students [2,3].

Medical education is considered stressful due to the numerous psychological changes that occur in medical students while pursuing their degrees [4]. Personal distress among medical students is relatively significant, which has a negative impact on their academic performance, competence, professionalism, and health. Multiple research studies conducted worldwide identified different factors such as a vast syllabus, academic pressure, dissatisfaction with education, worry about the future, parental pressure, and others that are responsible for the high occurrence of psychological disturbances among them [4-7]. These elements, coupled with a lack of elements that enhance quality of life, can raise stress levels [8,9]. In several medical colleges, the environment itself is under constant pressure. It creates an authoritarian and inflexible system, one that emphasizes competition rather than cooperation amongst learners [10].

Medical students begin to feel stress as soon as they begin their training. Even though some level of stress is acknowledged as a typical component of medical education and can serve as motivation for some students, not all of them are able to handle it [3,4,9]. There are several coping techniques that medical students have employed to deal with stress; the coping techniques used by students may affect the impact of stress on both mental and physical wellness, in addition to whether stress has a favourable or adverse effect. Problem avoidance, cynicism, social disengagement, and self-criticism are ineffective ways to deal with stress and can have detrimental effects on one's mental health, including sadness, feelings of anxiety, incompetence, helplessness, rage, and guilt [10]. Lack of sleep, impaired attention and concentration, impaired decision-making, poor performance in academics and clinical duties, low levels of tolerance, conflict with oneself and others, dropping out of the course, drug abuse, and ultimately decreased productivity in the future are harmful consequences of these [1].

Furthermore, there are serious repercussions in the form of suicide tendencies among stressed-out medical students, which are also seen. Suicide rates are high (relative to the general population) in many Indian medical colleges. Academic stress, followed by mental health problems, were the most noticeable reasons for suicide. Suicidal ideation among medical students is high and ranges from 1.8% to 53.6%. of which only 13% had ever sought psychiatric help before ending their lives [11].

It was shown that provisionally diagnosed depressive disorder and major depressive disorder in medical students were 21.5% and 7.6%, respectively [12]. Academic achievement and depression among medical students were significantly correlated. It's possible that the stigma attached to poor academic performance has a role. On the other side, because medical school is so competitive, even students with good grades may feel pressure [7]. Mental health

issues can result in a range of financial, educational, and employment difficulties if they are not promptly diagnosed and treated. These could eventually result in a lower quality of life [9].

Despite the fact that psychological disturbances are often signs of eventual mental health problems, students rarely seek help for their problems. Sociocultural stigma, a lack of family or peer support, a lack of access to treatment and counselling services, and poor infrastructure have all been identified as contributing factors for not pursuing professional help. Therefore, it is necessary to know the prevalence, causes, and levels of psychological disturbances among students, as these factors might have an impact on both their academic performance and health at various points throughout their study term [1].

Some nations conduct a yearly assessment and report from medical trainees and trainers on a variety of topics, including mental health, in light of the profession's vulnerability. However, there are no equivalent initiatives in India. This study was aimed at investigating the prevalence of symptoms of depression, anxiety, and stress among recently enrolled medical students, and the benefit of this research should be greater.

1.1 Objectives

1. To study the prevalence of symptoms of depression, anxiety, and stress among newly enrolled medical students.
2. To assess the association of sociodemographic factors with symptoms of depression, anxiety, and stress.

2. METHODOLOGY

2.1 Study Area and Study Design

A Cross-sectional study was conducted among medical students attending university who have joined the institute for a tenure of fifteen days to six months between June 2022 and September 2022.

2.2 Sample Size

Sample size was calculated using the following formula: [13]

$$n' = \frac{N\ Z^2 P\ (1-P)}{d^2(N-1) + Z^2\ P(1-P)}$$

Where,

n'= total number with finite population correction
N= population size (not known)
Z= static for level of confidence (1.960 for 95% CI)
P= expected proportion (0.5)
d = precision (0.05)
Using the above data, the sample size comes out to be 218. It was decided to achieve n = 250 or more.

2.3 Methods

The study was started after obtaining prior permission from the institutional ethics committee.

Data was collected via an online form, in which responses were anonymous. The online form was developed in the English language using "psych-toolkit" [14] software shared using WhatsApp groups. After taking participants prior informed consent in an online form, a questionnaire containing socio-demographic details and other related information, including age, gender, residence, socio-economic status, distance from home, study stream, reason to join study stream, relationship with family and friends, satisfaction regarding admission, an initial impression of the chosen study stream, and a history of mental health issues in the family, were filled out by the participants enrolled in the study. It also contains the "Depression Anxiety Stress Scale-21" (DASS-21) scale.

DASS-21 scale is a short scale that allows simultaneous assessment of symptoms of depression, anxiety, and stress. It is not a clinical instrument and cannot diagnose depression, anxiety, or stress. It will give an indication whether any of these issues are having a significant effect on the person's life at present. Each domain contains seven items, divided into subscales with similar content. The depression scale assesses dysphoria, hopelessness, devaluation of life, self-deprecation, lack of interest or involvement, anhedonia, and inertia. The anxiety scale assesses autonomic arousal, skeletal muscle effects, situational anxiety, and the subjective experience of anxious affect. The stress scale is sensitive to levels of chronic nonspecific arousal. It assesses difficulty relaxing, nervous arousal, being easily upset or agitated, being irritable or overly reactive, and being impatient. Respondents were asked to document on a 4-point severity/frequency scale

the extent to which they have experienced each state over the past week. 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 the time; 3: applied to me very much or most of the time [15].

A total of 327 students had participated in the study, out of which only 275 completed surveys. So, because 52 forms that were partially filled were excluded, the final number was N = 275.

2.4 Statistical Analysis

Collected data was compiled in an Excel sheet, and data was processed using SPSS trial version 25 statistical software. Data analysis was done using the Pearson correlation test, one-way ANOVA (analysis of variance), and two-tailed t-test. The value of $P < .05$ was considered statistically significant.

3. RESULTS

The study enrolled a total of 327 participants, of whom only 275 completed the survey. A total of 52 participants were dropped due to a lack of information. Table 1 shows the socio-demographic profile of the study populations, with an age ranging from 17 to 28 years (mean: 20.62 and SD: 2.73), and among the 275 participants, 138 (50.18%) were male and 137 (49.82%) were female. Out of all enrolled participants, the majority of them were residing in hostel 222 (80.72%), and only 53 (19.28%) were residing at home. In the study population, 56 (20.35%) were postgraduate medical students and 219 (59.3%) were undergraduate students, which include 104 (37.83%), 73 (26.55%), and 42 (15.25%) from MBBS, BDS, and BPT courses, respectively.

Fig. 1 displays the average score distribution on the scale of 0 to 3 for DASS-21 scale responses. It shows that among the study population, symptoms such as difficulty initiating work (1.59), nervousness (1.57), hopelessness (1.56), worthlessness (1.55), and apprehensive expectation (1.53) were scored highly compared to others.

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Fig. 2 displays the severity of symptoms of depression, anxiety, and stress among the study population. The prevalence of symptoms of mild, moderate, severe, and extremely severe depression was 15.6%, 32.7%, 10.2%, and 9.8%, respectively. The prevalence of symptoms of mild, moderate, severe, and extremely severe anxiety was 9.1%, 32.0%, 17.5%, and 19.6%, respectively, and the symptom severity of stress in terms of mild, moderate, severe, and extremely severe stress was 10.9%, 12.4%, 6.2%, and 3.6%, respectively.

Table 2A displays the correlation between symptoms of depression, anxiety, and stress with each other in the total sample. It shows that depressive symptoms have a strong correlation with both anxiety and stress symptoms. (r-values of 0.8128 and 0.8536, respectively) Symptoms of anxiety and stress also have a strong correlation. (r-value of 0.8235) Students who were having more symptoms of depression also had more symptoms of anxiety, and vice versa. Similarly, those who were having more symptoms of stress also had more symptoms of anxiety and depression, and vice versa.

Table 2B displays that students who had mild to extremely severe depressive symptoms had a moderately positive correlation with both anxiety and stress symptoms. (r-values of 0.7269 and 0.7961, respectively) Mild to extremely severe symptoms of anxiety had a moderately positive correlation with symptoms of depression and stress. (r-values of 0.7564 and 0.7688, respectively). Students who were having mild to extremely severe symptoms of stress also had a strong positive correlation with symptoms of depression and a moderate positive correlation with anxiety symptoms. (r-values of 0.8041 and 0.6972, respectively).

Table 3A shows associations between different demographic variables and depressive, anxiety, and stress symptoms using an unpaired T-test and one way ANOVA test among the study population. In which only the history of mental health issues in family shows statistically significant association for symptoms of depression, anxiety, and stress (*p-value= .01*) Other factors such as gender, place of residence, and socioeconomic status of the family were not showing any statistically significant difference.

Table 1. Socio demographic Profile

Demographic Variables		Frequency N=275 (%)
Age	**Mean ± SD**	20.62 ± 2.73
Gender	**Male**	138 (50.18%)
	Female	137 (49.82%)
Residence	**Hostel**	222 (80.72%)
	Home	53 (19.28%)
Socio-economic Status	**Lower**	6 (2.18%)
	Lower Middle	75 (27.27%)
	Upper Middle	139 (50.55%)
	Upper	55 (20.00%)
Distance From Home	**Near (Up to 150 km)**	98 (35.64%)
	Far (151 to 700km)	105 (38.18%)
	Very far (More than 700 km)	72 (26.18%)
Study Stream	**MBBS(Medical)**	104 (37.83%)
	BDS(Dental)	73 (26.55%)
	BPT(Physiotherapy)	42 (15.27%)
	Medical PG	56 (20.35%)
Reason to join the study stream	**Personal Choice**	215 (78.18%)
	Peer Pressure	36 (13.09%)
	Parent's Pressure	24 (8.73%)
Relationship with Family	**Strong**	217 (78.90%)
	Fair	47 (17.10%)
	Poor	11 (4.00%)
Relationship with Friends	**Strong**	189 (68.73%)
	Fair	75 (27.27%)
	Poor	11 (4.00%)
Satisfaction with regard to admission in this college	**Satisfied**	204 (74.18%)
	Unsatisfied	71 (25.82%)
Initial impression about their chosen study stream	**As per expectation**	170 (61.82%)
	Below expectation	85 (30.91%)
	Opposite to expectation	20 (7.27%)
History of mental health issues in family	**Present**	115 (41.82%)
	Absent	160 (58.18%)

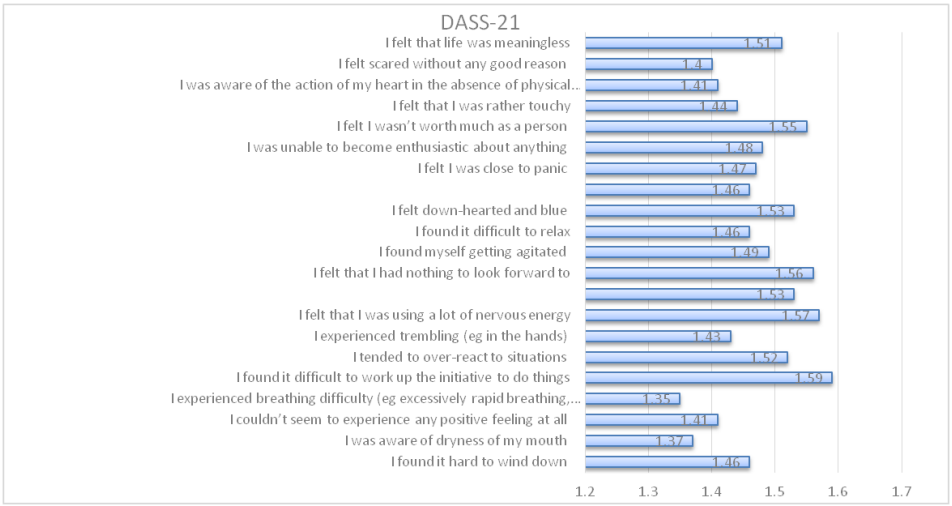

Fig. 1. Bar Chart showing average score distribution for DASS-21 scale responses among study population

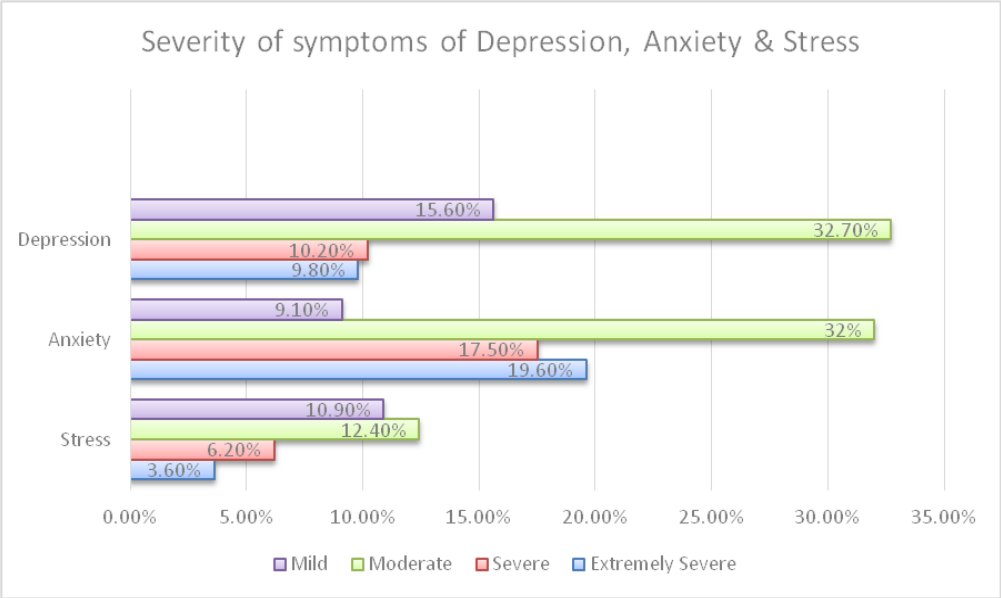

Fig. 2. Bar chart showing severity of Depression, Anxiety and Stress among study population

Table 2A. Correlation analysis of total sample for symptoms of depression, anxiety and stress

Correlation analysis of Total Sample Using Pearson Correlation (n= 275)		
Depression with Anxiety	**Depression with stress**	**Anxiety with Stress**
0.8128	0.8536	0.8235

Table 2B. Correlation analysis of symptoms of depression, anxiety and stress in students significantly affected by it

Correlation analysis			
	Depression	**Anxiety**	**Stress**
Depression (N=188)	-	0.7269	0.7961
Anxiety (N=215)	0.7564	-	0.7688
Stress (N=92)	0.8041	0.6972	-

Table 3B shows associations between different academic variables and depressive, anxiety, and stress symptoms using an unpaired T-test and a one-way ANOVA test among the study population. The mean value for depressive symptoms was high for factors such as family pressure to join the study stream (p-*value* < *.01*), poor relationships with friends (*p-value =.02*), and unsatisfaction with regard to admission (*p-value =.04*). Anxiety symptoms were statistically significantly associated with factors like peer and family pressure to join the study stream (*p-value < .01);* symptoms of stress were statistically significantly associated with factors like peer and family pressure to join the study stream (*p-value < .01);* and unsatisfaction with regard to admission (*p-value =.03).*

Table 3A. Association of different demographic variables with symptoms of depression, anxiety and stress

Variable		DASS-21 Score								
		Depression			Anxiety			Stress		
		Mean ± SD	t-value/ f-ratio	p- value	Mean ± SD	t-value/ f-ratio	p-value	Mean ± SD	t-value /f-ratio	p-value
Gender	Male	14.20 ± 7.59	0.23	.41	13.23 ± 7.35	0.01	.49	13.39 ± 7.17	0.11	.46
	Female	14.00 ±10.69			13.23 ± 8.87			13.5 ± 10.26		
Residence	Hostel	14.06 ± 8.96	0.25	.40	13.1 ± 7.72	0.54	.29	13.33 ± 8.53	0.44	.33
	Home	14.42 ±10.48			13.77 ± 9.72			13.92 ±10.05		
Socio-economic status	Lower	19.33 ±10.56	0.93	.42	17.33 ± 9.85	0.71	.55	15.67 ± 9.58	0.85	.47
	Lower Middle	13.92 ± 9.73			13.55 ± 8.61			13.79 ± 9.49		
	Upper Middle	13.67 ± 9.14			12.78 ± 7.79			12.69 ± 8.31		
	Upper	15.04 ± 8.70			13.48 ± 8.18			14.67 ± 9.12		
Distance From Home	Near (<150 km)	13.69 ± 9.37	1.75	.18	13.20 ± 8.39	0.74	.48	12.73 ± 8.62	2.98	.05
	Far (151-700km)	13.35 ± 8.47			12.63 ± 7.45			12.63 ± 8.04		
	Very far (> 700km)	15.86 ±10.03			14.14 ± 8.72			15.61 ± 9.90		
History of mental health issues in family	Present	15.98 ± 7.52	2.85	.01*	15.08 ± 7.03	3.25	.01*	14.99 ± 7.49	2.48	.01*
	Absent	12.80 ±10.13			11.90 ± 8.61			12.34 ± 9.55		

**p-value <.05 is significant*

Table 3B. Association between different academic variables and depressive, anxiety and stress symptoms

Variable		DASS-21 Score								
		Depression			Anxiety			Stress		
		Mean ± SD	t-value/ f-ratio	p- value	Mean ± SD	t-value/ f-ratio	p-value	Mean ± SD	t-value /f-ratio	p-value
Study Stream	MBBS (Medical)	15.40 ± 9.94	2.03	.11	13.96 ± 8.44	0.84	.48	14.56 ± 9.30	1.79	.15
	BDS (Dental)	12.05 ± 9.34			12.05 ± 8.18			11.51 ± 8.73		
	BPT (Physiotherapy)	13.71 ± 8.22			13.67 ± 7.55			13.48 ± 7.19		
	Medical PG	14.79 ± 8.20			13.07 ± 7.91			13.89 ± 8.96		
Reason to join the study stream	Personal Choice	12.78 ± 8.71	14.43	<.01*	12.01 ± 7.86	13.78	<.01*	12.31 ± 8.21	12.41	<.01*
	Peer Pressure	16.72 ± 7.06			16.11 ± 6.47			15.17 ± 7.18		
	Parent's Pressure	22.33 ±11.79			18.83 ± 8.73			21.08 ±12.03		
Relationship with Family	Strong	13.63 ± 9.11	2.28	.10	13.19 ± 7.95	.08	.92	13.22 ± 8.73	.39	.68
	Fair	16.72 ±10.23			13.57 ± 9.19			14.47 ± 9.78		
	Poor	12.91 ± 5.61			12.55 ± 7.49			13.64 ± 6.56		
Relationship with Friends	Strong	13.08 ± 8.73	4.02	.02*	12.68 ± 7.82	1.44	.24	12.69 ± 8.37	2.71	.07
	Fair	16.35 ± 9.68			14.35 ± 8.62			14.77 ± 9.24		
	Poor	17.09 ± 12.28			15.09 ± 9.57			17.45 ± 12.10		
Satisfaction with regard to admission in this	Satisfied	13.57 ± 8.61	1.71	.04*	12.87 ± 7.55	1.23	.11	12.86 ± 8.07	1.87	.03*
	Unsatisfied	15.75			14.25			15.13		

Variable		DASS-21 Score								
		Depression			Anxiety			Stress		
		Mean ± SD	t-value/ f-ratio	p- value	Mean ± SD	t-value/ f-ratio	p-value	Mean ± SD	t-value /f-ratio	p-value
college Initial impression about their chosen study stream	As per expectation	±10.78 13.78 ± 9.10	1.54	.22	± 9.59 12.73 ± 7.98	1.43	.24	±10.59 13.35 ± 8.83	2.46	.09
	Below expectation	14.02 ± 8.53			13.62 ± 7.64			12.68 ± 7.65		
	Opposite to expectation	17.60 ±12.69			15.80 ±10.86			17.50 ±12.33		

**p-value <.05 is significant.*

4. DISCUSSION

Several studies have demonstrated the detrimental impact of a lengthy and tiring medical education on students' psychological well-being. A high rate of stress among medical students is cause for concern because it could alter their behaviour, hinder their ability to learn, and eventually have an impact on patient care. The psychological state of students throughout their first year of study appears to be significantly impacted by the changes related to being a medical student [4].

This study is a type of cross-sectional study conducted among recently enrolled medical students (within the last fifteen days to six months) to find out the prevalence of symptoms of depression, anxiety, and stress in them and their association with various socio-demographic variables.

In the present study, the DASS-21 scale was used to assess the prevalence of symptoms of depression, anxiety, and stress in medical students, which were 68.4%, 78.2%, and 33.1%, respectively. A descriptive cross-sectional study done among medical students in India by Saumik Chakraborty et al. found the prevalence of depression, anxiety, and stress to be 45.3%, 52.4%, and 31.9%, respectively [1]. Another cross-sectional study done by Gupta et al. in India among undergraduate medical students found that more than half were affected by depression (51.3%), anxiety (66.9%), and stress (53%)—which is comparable to our study [3]. Similar research was done in Brazil by Natalia et al. using the DASS scale and showed that 34.6%, 37.2%, and 47.1% of medical students had depression, anxiety, and stress, respectively [16]. A study done by Hafsa Ali et al. in the Arabian Gulf University on 1st-year medical students using the Hospital Anxiety and Depression Scale (HADS) showed significant anxiety and depression (33.96% and 18.87%, respectively) [17].

A study conducted in Brazil found a higher prevalence of anxiety symptoms in first-year (30.8%) medical students compared to sixth-year (9.4%) medical students [18], while an investigation in Malaysia showed that anxious symptomatology was much more prevalent than depressive symptoms and that stress in students newly enrolling in medical school was greater than students at the latter stages of the course [19].

Due to the high academic, financial, and social expectations that college environments place on students at a time when they are also dealing with challenges connected to lifestyle and jobs, medical students experience high rates of psychiatric problems. The present study shows that the presence of mental health issues in the family is significantly associated with symptoms of depression, anxiety, and stress. Students who choose study stream under family pressure or peer pressure were having more symptoms of depression, anxiety and stress compare to those who choose stream by self. It can be due to the fact that when students enter medical school, they begin their professional journey with high parental expectations, a challenging curriculum, and intense peer and academic pressure. The consequences of which can be unsatisfaction with regard to admission, which in the present study is strongly associated with symptoms of stress and depression, Students also experience feelings of loneliness as they leave the safe, indulgent, and incredibly supportive environment of their family and move to a dorm in a highly competitive environment. During this time, good peer support helps to cope with the situation. Poor peer relationships are one of the factors that may lead to symptoms of depression [1].

Postgraduate medical students may experience increased psychiatric morbidity due to psychological stress brought on by their high levels of responsibility, demanding work schedules, lack of sleep, and frequent exposure to emotionally charged situations. Patient care quality, patient safety, and professionalism may all deteriorate as a result. Mental health issues may cause a number of impairments in terms of schooling, employment, and financial stability in the absence of prompt diagnosis and treatment.

In order to stop the onset of more severe stress-related disorders, it is crucial to teach stress-prevention techniques to students who are experiencing any level of psychological stress. There is a need for special actions to be taken to address a number of issues, such as the students' mental conditions at the time of their admission to medical colleges as well as their academic and social interactions while they were studying. Programs for wellness and mental health are also necessary to assist students in making a seamless transition between diverse learning contexts with changing learning demands and a growing burden on their mental and physical capacities [17,18,20].

Conducting stress-management workshops at the institutional level, routine mental-health check-ups in healthcare institutions, mental-health screening for students enrolling in healthcare courses, and prompt referrals to mental healthcare facilities are the main preventive measures to reduce mental health-related issues and suicides among students.

5. CONCLUSION

This study shows that there is a high level of symptoms of depression, anxiety, and stress among recently enrolled medical students, which provides insight into the improvement of their psychological wellbeing, which could potentially have a positive impact on decreasing suicide rates, increasing their quality of life, and improving patient care. The earlier the problems are identified, the earlier these measures can be instituted, so mental health screening should be done for all students entering medical courses at regular intervals. Counselling and preventive mental health services should be an essential part of the routine assessment of medical students, and actions should be taken to encourage the students to seek help when in distress.

6. LIMITATIONS

Only recently joined medical students are included in the study; other semester students should also be included for a better outcome. Further studies should be done to identify different sources and causes of stress and the effects of different intervention measures to avoid or cope with the psychological effect of the distress.

CONSENT

Prior informed consent was obtained through software ‘psytoolkit’ from the participants before collecting data for using data in future for analysis and publication.

ETHICAL APPROVAL

Prior permission of Sumandeep Vidyapeeth institutional ethics committee (SVIEC) was taken to start the study (SVIEC/ON/MED/SRP/ 4/22026).

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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