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Original Research Article

Predictors and coping strategies for stress, anxiety and depression among medical undergraduates and postgraduates in Puducherry

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ABSTRACT

Background: Higher proportion of medical students experience stress, anxiety and depression than compared to general population in Indian settings which are often underdiagnosed. This study aim was to assess the frequency, predictors and coping strategies of stress, anxiety and depression among the medical undergraduates and postgraduates of a tertiary care teaching hospital.
Methods: Questionnaire based online cross-sectional study was conducted among 350 medical undergraduates and post graduate students from June to July, 2021. Sociodemographic profile, questions from the depression, anxiety, stress scale-4 and details of coping strategies were collected. The data were analysed using SPSS 21.0 Descriptive statistics, Chi square test and Multinomial logistic regression analysis were used. P value <0.05 was considered statistically significant.
Results: The mean age of the participants was 21.5±3.1 years. Majority (63.1%) belonged to upper middle class. 92.3% joined the medical course with personal interest. The frequency of severe depression, anxiety and stress was 22.4%, 16.2% and 18% respectively. The frequency of extremely severe depression, anxiety and stress was 16.4%, 23.2% and 9% respectively. Acceptance, self-distraction and positive reframing were commonly followed coping strategies. Substance abuse and behavioural disengagement were the least followed. Significant association was observed between Emotion focused and avoidant coping with depression, anxiety and stress.
Conclusions: Higher frequency of depression (47.1%), anxiety (52.9%), and stress (38%), was observed among the students. Acceptance, positive reframing and self-distraction were commonly used coping strategies. Significant association seen with depression, anxiety and stress with emotion- focused and avoidant coping strategies.

Keywords: Anxiety, Coping strategies, DASS 42, Depression, Stress

INTRODUCTION

Depression is a common mental disorder affecting more than 264 million people worldwide.[1] Higher proportion of doctors in Indian settings experience depression, stress, and burnout which is associated with long working hours and less interpersonal interactions among them.[2] The estimated prevalence of depression, anxiety and stress among medical students is 51.3%, 66.9%, and 53% respectively.[3] In general, the environment of the medical school is often considered stressful that can turn down the academic performance of medical students and weaken their physical health and psychosocial wellbeing.[4] So these students are frequently subjected to compulsion of academics with a commitment to excel and difficulties of adapting to the system which affect their learning ability and intellectual performance.[5] These psychological distress has an undesirable impact on student abilities and the worst outcome may result in the development of behavioral problems. The frequently interconnected stress and medical schools are often underdiagnosed.[8] Compared to the general population, medical students experience a

higher rate of suicidal ideation, in addition to mental health deterioration over the course of medical training.[6,7]

Coping is a process of handling external or internal stress that is imitated as tough or exceeding own resources.[9] Coping strategies differ from person to person based on their levels of stress and experience in dealing and are classified into problem-focused, emotion-focused and avoidant coping strategies. Problem-focused coping strategies are categorized by the subscales of active coping, positive reframing, planning, and use of informational support; emotion-based coping strategies are categorized by the subscales of use of emotional support, venting, humor, acceptance, religion and self-blame; whereas avoidant strategies by the subscales of denial, substance use, behavioral disengagement, and self-distraction.[10] A study done in Gujarat showed that the commonly used coping strategies among the medical students were active coping 50.2%, planning 46.0%, and positive reframing 42.2%.[11] Based on this background, the present study was designed with the objective to study the frequency, predictors, and severity of stress, anxiety and depression among the medical undergraduates and postgraduates of a tertiary care teaching hospital. In addition, coping strategies and comparison of the stress, anxiety and depression with coping strategies handled by them were also assessed.

METHODS

This questionnaire based cross-sectional study was conducted among the MBBS undergraduates and MD/MS postgraduates studying at Sri Venkateshwaraa Medical College Hospital and Research Center which is a tertiary care teaching hospital, Puducherry. The online survey was conducted in the department of pharmacology for 2 months (June- July 2021) using Google forms electronic platform. Male and female MBBS (first to final year) students, Postgraduates of clinical and non-clinical departments, the students who completely filled the questionnaire survey were included in the study. Medical students with recent history of any major incident affecting their mental health were excluded from the study. The survey questionnaire was sent second time in case students did not respond at the first instance. The sample size was calculated as 242 using the Statcalc sample size calculator with 95% confidence interval, allowable error 5% and non-response rate of 10% rounded to 350 based on calculated prevalence rate of depression (20-52%) among medical students in India.[3,11] Convenience sampling method was adopted. Out of the 350 students, 300 were undergraduates, and 50 were postgraduates. The study was done with the perusal of the head of the institution and then consent was taken from those selected to participate. The nature and purpose of the study was explained and written informed consent was obtained from all the medical students. Confidentiality was maintained throughout the study. The permission to conduct this study was obtained from Institutional Scientific Research Committee and Institutional Ethics Committee (number: 6/SVMCH/IEC/0820).

Data collection tool

A case study form consisting of 1) socio-demographic details, personal history, family history, academic profile, medication details (if any), 2) predictors of stress, anxiety and depression (DASS questionnaire -42) and 3) details of coping strategies (Brief COPE) was used (Annexure 1).

Socio-demographic details

Age, gender, year of course, specialty of course (in case of postgraduates), locality (day scholar/hosteller), relationship/ marital status, and socioeconomic status were documented.

Predictors of stress, anxiety and depression

A standardized survey scale- depression, anxiety and stress scale was used as described by Lovibond and Lovibond.[12] Each of the study participant was given a copy of DASS 42 questionnaire and sufficient time was given to fill scale in order to assess stress, anxiety and depression level. This scale consists of 14 questions for each category. (Annexure 1)

Questions 3, 5, 10, 13, 16, 17, 21, 24, 26, 31, 34, 37, 38 and 42 comprised of the depression scale was used to assess dysphoria, deviation of life, hopelessness, self-deprecation, lack of interest or involvement and inertia.

Questions 2, 4, 7, 9, 15, 19, 20, 23, 25, 28, 30, 36, 40 and 41 comprised of the anxiety scale was used to assess autonomic arousal.

Questions 1, 6, 8, 11, 12, 14, 18, 22, 27, 29, 32, 33, 35, 39 comprised of the stress scale was used to assess difficulty in relaxing, nervous, arousal and being easily upset or agitated or irritable.

The rating scale for DASS ranges from 0-3 as follows: 0- did not apply to me at all; 1- applied to me to some degree or to some of the time; 2- applied to me to a considerable degree, or to a good part of the time; 3- applied to me very much, or most of the time. The maximum score in DASS 42 scale was 42 in each category (depression, anxiety and stress) individually. This DASS 42 questionnaire categorizes each condition into five subcategories, namely normal, mild, moderate, severe and extremely severe. All the three scores were added as shown in Table 1.

Coping strategies

Brief COPE inventory was used to assess the methods of coping strategies used by both medical undergraduates and postgraduates.[10] In reference with the serial numbers of the questionnaire, they were assessed by further classifying them into 14 subdivisions (Annexure 1). These 14

subdivisions were grouped under 3 divisions: problem focused coping, emotion focused coping, and avoidant coping. The rating scale for BRIEF COPE inventory ranges from 1 to 4 as follows: 1) I haven't been doing this at all; 2) a little bit; 3) a medium amount; 4) I have been doing this a lot was used.

Table 1: Scores of subscales of depression, anxiety and stress (DASS-42).

Category	Depression	Anxiety	Stress
Normal	0-9	0-7	0-14
Mild	10-13	8-9	15-18
Moderate	14-20	10-14	19-25
Severe	21-27	15-19	26-33
Extremely severe	28+	20+	34+

Statistical analysis

Data was entered and analysed using SPSS software 21.0 (SPSS Inc, Chicago, III., USA.) and expressed in descriptive statistics. Quantitative variable like age, stress, anxiety and depression scores were summarized as mean±standard deviation and qualitative variables were expressed in frequency and percentage. Chi square test and Multinomial logistic regression analysis was used to compare the dependent (outcome) variables with sociodemographic data. P value <0.05 was considered as statistically significant

RESULTS

In total, 350 students (both undergraduates and postgraduates) participated in the study, which makes the response rate as 100%. The mean age of the participants was 21.5±3.1 years, with a range of 18 years to 26 years and above. Majority of the students belonged to upper middle class (63.1%). 92.3% of the study participants joined the medical course with personal interest. Table 2 shows the socio demographic data of the medical undergraduates and postgraduates (N=350) with female predominance.

Table 2: Socio demographic data of the study participants.

Socio demographic variables		N = 350 (%)
Age (years)	18-21	226 (64.6)
	22-25	82 (23.4)
	26 and above	42 (12)
Gender	Male	116 (33.1)
	Female	234 (66.9)
Religion	Hindu	303 (86.5)
	Christian	32 (9.1)
	Muslim	7 (2.0)
	Islam	5 (1.4)
	Atheist	3 (0.8)
Course(MBBS)	First year	75 (21.4)
	Second year	75 (21.4)
	Third year	75 (21.4)
	Final year	75 (21.4)
	Postgraduates (PG)	50 (14.3)
Reason to join course	Personal	323 (92.3)
	Parental pressure	27 (7.7)
Socio economic status	Upper class	51 (14.6)
	Upper middle	221 (63.1)
	Lower middle	67 (19.1)
	Upper lower	6 (1.7)
	Lower class	5 (1.4)
Relationshipstatus	Committed	13 (3.7)
	Married	16 (4.6)
	Single	321 (91.7)
Locality	Day scholars	199 (56.9)
	Hostellers	151 (43.1)
Nativity	Pondicherry	146 (41.7)
	Tamil Nadu	151 (43.1)
	Other States	153 (15.1)

The overall mean score of depression, anxiety and stress was 11±9.6, 9.6±8, and 12.8±9 respectively and their frequencies are 47.1%, 52.9% and 38% respectively, as shown in Table 3.

Table 3: Frequency distribution of depression, anxiety and stress among the medical undergraduates and postgraduates.

Dependent variables	Scores (%)
Depression	165 (47.1)
Anxiety	185 (52.9)
Stress	133 (38)

According to the DASS-42 scorings mentioned in Table 1, they are categorized into different grading of depression, anxiety and stress among the study participants, which are mild, moderate, severe and extremely severe (Table 4). The prevalence of severe depression, anxiety and stress was 37 (22.4%), 30 (16.2%) and 24 (18%) respectively. The prevalence of extremely severe depression, anxiety and stress was 27 (16.4%), 43 (23.2%) and 12 (9%) respectively.

Table 4: Distribution of grading of depression, anxiety and stress among the study participants.

Subcategories	Depression n (%)	Anxiety n (%)	Stress n (%)
Mild	57 (34.5)	38 (20.5)	52 (39.1)
Moderate	44 (26.7)	74 (40)	45 (33.8)
Severe	37 (22.4)	30 (16.2)	24 (18)
Extremely severe	27 (16.4)	43 (23.2)	12 (9)

Table 5: Association of stress with socio demographic details.

Explanatory variables		Stress		P value
		Yes (133)	No (217)	
Gender	Male	43	73	0.295
	Female	90	144	
Age	18-21 years	89	137	0.239
	22-25 years	28	54	
	26+ years	16	26	
Relationshipstatus	Single	119	201	0.019*
	Committed	9	4	
	Married	5	11	
Socio economicstatus	Upper class	17	34	0.008*
	Upper middle	80	141	
	Lower middle	31	36	
	Upper lower	2	4	
	Lower class	3	2	
Course (MBBS)	First year	33	42	0.601
	Second year	27	48	
	Third year	24	51	
	Final year	29	46	
	Postgraduates	20	30	
Reason to join course	Personal	117	206	0.0001*
	Parental pressure	16	11	
Locality	Day scholars	66	133	0.076
	Hostellers	67	84	
Nativity	Puducherry	50	96	0.516
	Tamil Nadu	59	92	
	Other states	24	29	

*p value <0.05 in Pearson chi-square test

A significant association was reported between "stress and relationship status" (p=0.019), "stress and socio-economic status" (p=0.008), and "stress and reason to join course" (p=0.0001) (Table 5). The coping strategies employed by the study participants revealed the distribution of the categories, as given in Table 6.

The commonly used coping strategies were (in decreasing order) acceptance (49.7%), self-distraction (48.8%), positive reframing (46.6%), planning (43.1%) active coping (42.8%), religious belief (34.8%), use of informational support (26.6%), self-blame (25.4%), use of emotional support (24.8%), humour (23.1%), venting

(17.1%), denial (16%), behavioral disengagement (14.3%), and substance abuse (2.3%) (Table 7).

Table 6: Distribution of coping strategies of medical students.

Coping Strategies	Mean±SD
Problem focused	2.4±0.71
Emotion focused	2.2±0.61
Avoidant	1.9±0.5

Table 7: Frequency distribution of problem focused, emotion focused and avoidant coping strategies.

Coping strategies	Subcategories	N	Percentage
Problem focused	Active coping	150	42.8
	Use of informational support	93	26.6
	Positive reframing	163	46.6
	Planning	151	43.1
	Use of emotional support	87	24.8
	Venting	60	17.1
	Humour	81	23.1
Emotion focused	Acceptance	174	49.7
	Religion	122	34.8
	Self-blame	89	25.4
Avoidant	Self-distraction	171	48.8
	Denial	56	16
	Substance abuse	8	2.3
	Behavioral disengagement	50	14.3

Table 8: Association of coping with depression, anxiety and stress among the study participants.

Coping strategies	Dependent variables	Value	P value
Problem focused	Depression	3.803	0.433
	Anxiety	7.457	0.114
	Stress	4.216	0.378
Emotion focused	Depression	36.554	0.0001*
	Anxiety	28.725	0.0001*
	Stress	25.105	0.0001*
Avoidant	Depression	13.331	0.010*
	Anxiety	22.828	0.0001*
	Stress	14.440	0.006*

*p value <0.05 in multivariate analysis

Acceptance, self-distraction and positive reframing were the most popular mechanisms of coping strategies followed by the study participants. Substance abuse and behavioural disengagement were the least popular mechanisms that were followed.

A significant association was reported between "emotion focused coping and depression", "emotion focused coping and anxiety", "emotion focused coping and stress", "avoidant coping and depression", "avoidant coping and anxiety", and "avoidant coping and stress" (Table 8).

DISCUSSION

Medical students are vulnerable to increased mental health concerns as a result of the burden of their academic life requirements. Especially stress, anxiety, and depression among them have been associated with personal endurance and ability, lack of time for other leisure activities, feeling of anonymity, lack of social time, and peer competition. This Institutional, questionnaire-based cross-sectional survey showed that the frequency of depression was 47.1%, anxiety 52.9% and stress 38% among 350 medical students using a valid depression and anxiety screening tool, DASS-42. A recent systematic review collated in India reported that the frequency of depression, anxiety and stress among medical students were 39.2%, 34.5% and 51.3% respectively.[15] The study also revealed a wide range of prevalence of depression among medical students, ranging from 8.5% to 71% across India.[15] In addition, the sum of clinically significant anxiety was 56.4% and stress was 52.9% which is high when compared to our study. It was also documented that prevalence of depression (32.1%), anxiety (40.1%), and stress (43.8%) among the medical students enrolled in a government medical college of the metropolitan city from India where stress is high compared to the present study.[16] Low prevalence (27%) of psychiatric morbidity among the United Kingdom medical students was also reported.[17] The age group of 18-21 years are more prone to stress and anxiety as per the present study. Male participants were more depressed than female participants whereas female participants were more anxious and stressed. In this study, mild to moderate depression range from 34 to 27%, anxiety from 20 to 40%, and stress from 39 to 33%, whereas severe to extremely severe scales range from 22 to 16% for depression, from 16 to 23% for anxiety and 18 to 9% for stress. So, students with mild to moderate scores can be easily managed with efficient coping strategies. In addition, day scholars were found to be more depressed than hostellers. This may be due to the reason that long travel is required for them to travel from and to the college which is around twenty kilometers from Puducherry town, due to which the students eventually become exhausted and have comparatively less time for studying than the hostellers. However, it was found that hostellers are found to be more anxious and stressed than day scholars. Students belonging to Puducherry were found to have more depression and anxiety as compared to students from Tamil Nadu and other states. However, students from Tamil Nadu were found to have more anxiety too. A significant association was observed with stress among upper-middle and lower-middle socioeconomic group, single participants compared to committed and married participants in the present study. Study done by Babar et al also showed a higher percentage of depression, anxiety and stress among medical students participants, which significantly related to lower scores in their academic performances.[18] A higher prevalence of

depression, anxiety, and stress could be associated with the fact that enormous syllabus has to be balanced and covered in a limited period, insufficient time allocated to clinical posting, change in their style of studying, switch to a new environment, thought or fear of appearing or failing in exams. Furthermore, social stress such as relationships with peer groups, hostel friends, financial problems and displacement from home, difficulty in relaxing and getting frequently upset by trivial things. Parents and Institutions constantly immerse the fear of non-success, which influences medical students' self-esteem and possession. Financial supremacy and family expectation to select medical field is also a major concern among medical students who pursue their studies in private medical colleges in India. In addition, single individuals are more likely to have stress and anxiety, which could be due to a lack of sharing their grief, social support, and social buffer.

Coping strategies refer to the specific efforts, both behavioral and psychological that students employ to reduce, master, minimize or tolerate stressful events. Avoidance-oriented coping strategies describe activities, and cognitive changes aim at avoiding the stressful situation, while problem-oriented coping is described as a purposeful task and effort aimed at solving the problem (active coping) or attempting to alter the situation/planning. Emotion-oriented coping describes turning to religion, positive venting, humor, acceptance, self-blame, and seeking emotional support. Among the coping strategies, acceptance, self-distraction and, positive reframing were the common coping used by the medical graduates in the present study. Substance abuse and behavioral disengagement were least commonly used by them. A study done by Goyal et al showed that active coping, planning, and positive reframing were adopted commonly among medical students in Gujarat. Denial and substance abuse were less commonly used by them.[11] The present study revealed that avoiding medical discussions with friends, engaging with increased physical activities, and other hobbies like self-distraction is a strategy that lessens stress. Our study found a significant association between emotion-focused and avoidant coping with a frequency of depression, anxiety, and stress within the study participants, which is comparable with a study done among the health professionals in Saudi Arabia during this COVID pandemic, whereas the insignificant association was noticed between problem-focused coping with depression, anxiety, and stress scales.[14,19] It appears that based on this study, the medical students were trying to find multiple ways to lessen the negative effect of the stress, anxiety and depression they experience, to improve their health, quality of life, and performance. Screening and great attention to depression, anxiety and stress among undergraduate and postgraduate medical students are recommended for their psychological wellbeing to improve their quality of life and better professional development. Additionally, at the institute level, there must be screening of mental health along with counselling at the regular level and stress management interventions in order to improve their learning quality, skill acquisitions and positive professional outcome.

The limitations of the present study are all the stress and depression could not be associated to only medical school related and also quite possible with other psychosocial factors which were not evaluated. In addition, this single center, cross-sectional assessment may not be generalized and does not provide a longitudinal perspective of the problem. Further studies based on longitudinal study designs are necessary to overcome this limitation. Online nature of this survey may lead to a responder bias.

CONCLUSION

The present study revealed a considerably higher frequency of depression (47.1%), anxiety (52.9%), and stress (38%), among medical undergraduate and post-graduate students. There was a significant association between depression with reason to join the course, stress with relationship status, socioeconomic status and reason to join the course. The coping strategies used by the majority of the study participants to overcome psychological symptoms were acceptance, positive reframing and self-distraction. Significant associations were observed with depression, anxiety and stress with emotion- focused and avoidant coping strategies.

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