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Original article

Perceived Stress, Anxiety and Depression among medical undergraduate students in a private medical college – A cross-sectional observational study

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Abstract
Stress is the discrepancy between what is happening and what should be happening. Medical education is a competitive milieu, and stress is commonly perceived among medical students. Inability to cope with stressors may lead to primary psychiatric problems like depression and anxiety, which can interfere with their learning capabilities. This study aimed to assess the perceived stress, anxiety, and depression among medical college students. This cross-sectional study was conducted among first-year and final-year medical college students. A semi-structured proforma, including a socio-demographic profile, was used. Stress among medical college students was assessed by the Perceived Stress Scale – 10 (PSS-10), Anxiety was assessed by the generalised Anxiety disorder scale – 7 (GAD-7), and Depression was assessed by the Hamilton Depression Rating Scale (HDRS-17). The data were entered into Excel and analyzed using SPSS. Moderate stress was perceived to the extent of 24.3% in the first year, 17.6% in the second year, 21.3% in third year and 18% among the final year and there is no significant difference between male and female medical students for perceived stress. 10 students had severe anxiety, and 8.4% of the medical students were moderately to severely depressed. This study reveals moderate stress severity during all four academic years, with a slight decline during the second year. Stress management programs and time management sessions at the beginning of every year, followed by mental health education.
Keywords: *Perceived stress, depression, anxiety, medical students.*

INTRODUCTION

Stress is the discrepancy between what is happening and what should be happening. Medical education is a competitive milieu, and stress is commonly perceived among medical students. Hans Selye formulated a three-stage model of general adaptation syndrome, which is a stress response model when any person recognises the existence of the stressor. The first stage is called the alarm reaction, where there is physiological arousal to combat the challenge. If the stress continues, then the second stage, called the stage of resistance, occurs to stabilise the physiological changes by coping. If the stress prolongs further, then the third stage of exhaustion ensues [(1)]. Chronic overactivation of stress can have detrimental effects on the student's social life, personal life, and academic performance, leading to a higher chance of medical college students suffering from mental health issues like Anxiety, Depression, insomnia, and other psychological problems. Subsequently, in the long run, the student's overall well-being deteriorates, which could only be evident in advanced stages, and this in turn could take a toll on patient care, safety, and professional experience [(2)].

The inability to cope with stressors may lead to primary psychiatric problems like depression and anxiety, which can interfere with their learning capabilities. Depression is characterised by a persistent sad mood, loss of interest, easy fatiguability, feelings of hopelessness, ideas of guilt and worthlessness, decreased attention and concentration, sleep

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disturbances, poor appetite, declined libido and infrequently with suicidal thoughts [3]. Identifying perceived stress and psychiatric problems in an academic milieu may help in prevention strategies and remedial measures.

Anxiety can have a greater impact on one's cognition, feelings, behaviour, and physiological functions. According to Attention Control Theory by Eysenck et al. (2007), cognitive performance can be impaired by state anxiety due to its impact on the stimulus-driven (bottom-up) attentional system [4]. The cognitive symptoms of anxiety include negative evaluation by others, disturbing thoughts, poor attention and concentration, hypervigilance, poor memory, distractions, and fear of losing control. Physiological symptoms of anxiety are characterised by palpitations, sweating, nausea, butterfly in the stomach, lump in the throat sensations, cold extremities, an increase in heart rate, urgency in micturition, dizziness, weakness, and tremors. Behavioural symptoms of anxiety include avoidance, escapism, reassurance, restlessness, agitation, and pacing [5].

The challenges in the medical colleges are perceived in the form of greater life expectations, increasing academic demands, unstructured time, placement in a new environment, and changes in the familial relationship. As per Anuradha et al. (2017), the vastness of the academic curriculum, fear of failure, poor performance in the examination, and lack of recreation are important factors in the culmination of stress [6]. Similar findings were replicated in another research paper by Raja et al. (2022) [7]. The prevalence of depression and anxiety in medical students is higher than in the general population. Arun et al. (2022), in their study among medical students in a tertiary medical care, showed the prevalence of Depression to be 13.9% (moderately severe and severe) and anxiety disorder to be 20.2% (moderate and severe) [8]. Aghajani Liasi et al. (2021), in their research, mentioned that the prevalence of depression was 37.5%, anxiety disorder was 41.1%, and stress was 30.3% [9]. The present study was done in a medical college hospital in the outskirts of Chennai.

METHODOLOGY

A cross-sectional, observational study was conducted among the first year, second year, pre-final year and final year medical college students of Sri Muthukumaran Medical College Hospital and Research Institute in the year 2020-2021. First and second year of the study population was from the competency based medical education which was implemented from the year 2019. Pre-final and final year medical students were from the old curriculum. Both male and female students above 18 years were included in the study and students not willing to provide consent were excluded from the study. The study was conducted after getting institutional ethical committee clearance.

Out of 602 total number of students in our college, 403 students gave informed consent to participate in the study, the students were subjected to a semi-structured proforma including the sociodemographic details, followed by questionnaires. Perceived stress scale (PSS-10), Generalized Anxiety disorder scale (GAD-7) and Hamilton Depression rating scale (HDRS-17) were used in our study.

Perceived stress scale (PSS-10) is self-administered questionnaire to evaluate stress. It has been proved in various study to show good reliability and validity. The questions in this scale ask the students about their thoughts and feelings during the last month using a five-point Likert scale. It is a 10-item questionnaire with responses 0-never, 1-almost never, 2-sometimes, 3-fairly often and 4-very often. The scores of the question 4, 5, 7 and 8 had to be reversed, before summing up the total score. Scores ranging from 0 to 13 is considered to be low stress, 14 to 26 is moderate stress and 27 to 40 is severe stress [10].

Generalized anxiety disorder – 7 scale (GAD-7) is a seven-item self-administered questionnaire, each item scored on a 4-point Likert scale (0 – not at all, 1- several days, 2- more than half the days, 3 – nearly every day) to evaluate worry and anxiety symptoms. The score ranges from 0 to 21 (minimal anxiety – 0 to 4, mild anxiety – 5 to 9, moderate anxiety – 10 to 14 and severe anxiety – 15 to 21). It has good reliability and construct validity [11].

Hamilton Depression Rating Scale 17 item (HDRS-17) was developed by Max Hamilton in the year 1960, which is a clinician administered gold standard rating scale for depression. The total score of the HDRS-17 ranges from 0 to 52. Scores from 1 to 7 is normal, 8 to 16 is mild, 17 to 23 is moderate and more than 24 is severe. It is known to have good reliability and validity. The 17 items consist of depressed mood, feelings of guilt, suicide, insomnia (early, middle, late), work and activities, psychomotor retardation, agitation, anxiety, somatic symptoms, genital symptoms, hypochondriasis, loss of weight, insight [12]. The data was entered into an excel sheet and analysed with SPSS version 22. Descriptive statistics such as mean, standard deviation and proportions were calculated, Two-way Anova and chi-squared test were used to vouch the statistical significance, p-value of less than 0.05.

RESULTS

Out of 602 total number of students, 403 students were individually interviewed, and questionnaires administered. Out of 403 MBBS students, 120 students (29.8%) were from first year, 86 students (21.4%) from second year, 107 students (26.5%) from third year and 90 students (22.3%) were from fourth year MBBS. 267 students (63.3%) were day scholars, and 136 students (33.7%) were hostelers. Table 1 shows the year-wise, gender-wise and residential distribution of the medical college students.

Table 1: Year-wise, Gender-wise and Residential distribution of medical college students:

Year of study	Gender Male – 152 (37.7%) Female – 251 (62.3%)	Residence		Total N=403
		Hostelers	Day scholars	
		N=136 (33.7%)	N=267 (66.3%)	
First year	Male (45)	17 (14.2%)	28 (23.3%)	120
	Female (75)	23 (19.2%)	52 (43.3%)	
Second year	Male (31)	9 (10.4%)	22 (18.3%)	86
	Female (55)	22 (18.3%)	33 (38.3%)	
Third year	Male (44)	5 (4.7%)	39 (36.4%)	107
	Female (63)	20 (18.7%)	43 (40.2%)	
Fourth year	Male (32)	3 (3.3%)	29 (32.2%)	90
	Female (58)	37 (41.2%)	21 (23.3%)	

On the Perceived stress scale, majority of the medical students are moderately stressed (329, 81.6%) and 18 students (4.5%) had higher perceived stress and 56 students had low perceived stress (13.9%). Female students (200) outnumbered male students (129) in moderate stress. With reference to low stress, there were 40 females and 16 males, among high perceived stress group, there were 11 females and 7 males. Moderate stress was perceived to the extent of 24.3% among first year, 17.6% among second year, 21.3% among third year and 18% among final year. There is no significant difference of perceived stress with reference to entry level, mid-level or exit level of their academic course. Table 2 shows the year-wise and gender distribution of stress severity and Table 3 shows the mean and standard deviation of medical college students for stress severity.

Table 2: Year wise and gender distribution of stress severity.

Year of Study		Stress severity			Total N=403
		Low Stress N=56, 13.9%	Moderate Stress N=329, 81.6%	High Perceived stress N=18, 4.5%	
First year	Male	5 (4.2%)	38 (31.7%)	2 (1.7%)	45 (37.5%)
	Female	12 (10%)	60 (50%)	3 (2.5%)	75 (62.5%)
Second year	Male	3 (3.5%)	27 (31.4%)	1 (1.2%)	31 (36%)
	Female	10 (11.7%)	44 (51.2%)	1 (1.2%)	55 (64%)
Third year	Male	5 (4.7%)	36 (33.6%)	3 (2.8%)	44 (41.1%)
	Female	9 (8.4%)	50 (46.7%)	4 (3.7%)	63 (58.9%)
Final year	Male	3 (3.3%)	28 (31.1%)	1 (1.1%)	32 (35.6%)
	Female	9 (10%)	46 (51.1%)	3 (3.3%)	58 (64.4%)

Table 3: Mean and standard deviation of medical college students for stress severity.

Year of Study	Gender	Mean	Std. Deviation	N	p-value
First year	Male	18.04	3.723	45	
	Female	17.97	5.477	75	
	Total	18.00	4.877	120	
Second year	Male	17.35	4.543	31	
	Female	16.82	5.991	55	
	Total	17.01	5.491	86	

Third year	Male	17.95	6.142	44	0.935**
	Female	18.11	4.367	63	
	Total	18.05	5.144	107	
Final year	Male	18.63	3.998	32	
	Female	19.09	4.957	58	
	Total	18.92	4.621	90	
Total	Male	18.00	4.726	152	
	Female	18.01	5.249	251	
	Total	18.01	5.052	403	
** Significance by two-way anova for perceived stress					

The mean score of perceived stress during second year (17.087) seemed to be lesser than first year and third year (which are similar 18.009 and 18.033 respectively, and during the fourth year it seems to be higher 18.856 as shown in Figure 2. This may be interpreted that the students both male and female were anticipating more stress in the first year and able to cope up to a moderate level in the second year but the successive third and fourth year seemed to be on the same level. This consistency of moderate stress severity is due to various factors in the academic milieu, this is in tandem with the previous research [13] and there is no significant difference between male and female students as shown in Table 5. Figure 3 shows the Post hoc test for year of study and gender to compare perceived stress.

Figure 2: Mean stress score of medical college students.

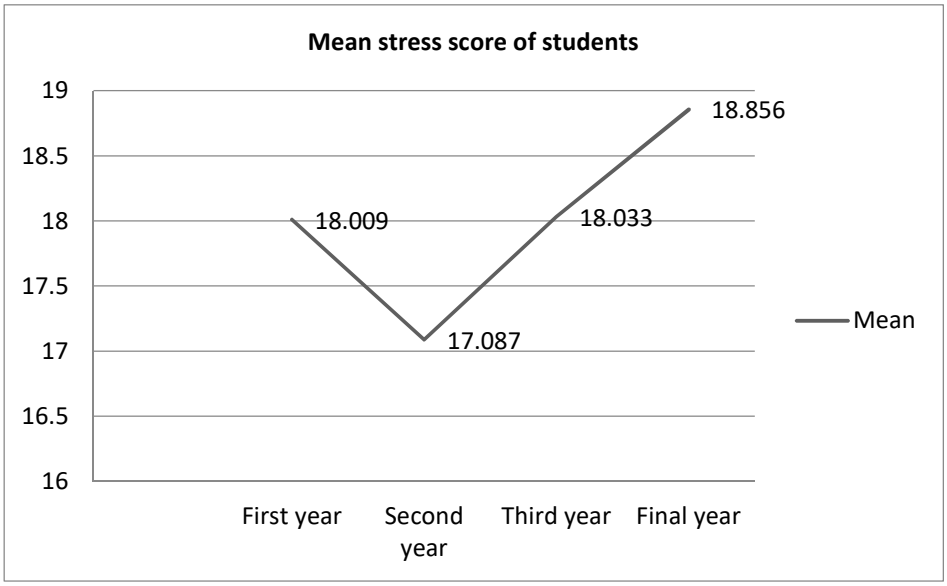

Table 5: Two-way Anova table for year of study and Gender to compare perceived stress.

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Year of Study	126.665	3	42.222	1.653	.177
Gender	.001	1	.001	.000	.996
Year of Study * Gender	10.865	3	3.622	.142	.935

Figure 3: Post hoc test for year of study and Gender to compare perceived stress.

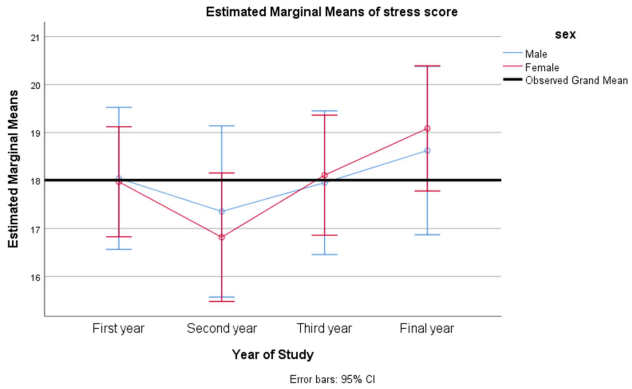

Table 6 shows the year wise distribution for Depression severity. 124 students (30.8%) had mild depressive symptoms, 30 students (7.4%) were moderately depressed, and 4 students (1%) were severely depressed. Those who qualified for severely depressed category as per HAM-D scale are subjected to clinical examination and managed appropriately. Key relatives were instructed to supervise adherence to lifestyle changes and sleep hygiene of the students.

Table 6: Year-wise distribution of Depression severity.

		Ham D severity				**Total**
		No Depression	**Mild Depression**	**Moderate Depression**	**Severe Depression**	
Year of Study	**First year**	75 (18.6%)	37 (9.2%)	7 (1.7%))	1 (0.25%)	120 (29.8%)
	Second year	51 (12.6%)	28 (6.9%)	7 (1.7%)	0 (0%)	86 (21.3%)
	Third year	72 (17.9%)	32 (7.9%)	3 (0.7%)	0 (0%)	107 (26.5%)
	Final year	47 (11.7%)	27 (6.7%)	13 (3.2%)	3 (0.75%)	90 (22.3%)
Total		245 (60.8%)	124 (30.8%)	30 (7.4%)	4 (1%)	403 (100%)

On Generalized anxiety disorder – 7 scale, 138 students (34.2%) had mild anxiety, 27 students (6.7%) had moderate anxiety and 10 students (2.5%) were severely anxious, they were subjected to relaxation therapy and deep breathing exercises.

Some students admitted that they had financial difficulties in their families but that did not reflect in a significant way on the data of the perceived stress. 28.5% of the students expressed sleep problems, 26.3% of the students were at times upset for being away from the home and 5.5% of the students admitted that they have misconception about sex related issues.

Discussion:

This study reveals moderate stress severity during all the four academic years but with the slight decline during second year (mean score from 18.009 to 17.087). With the absence of other precipitating and perpetuating psychosocial stressful factors, it may be deduced that their moderate stress severity is directly related to academic milieu. With the present Competency – Based Medical Education, periodic examination, internal assessment, skill-based training, work schedule and time management could be the factors for the moderate stress severity. This is in contrast with previous studies that, severity of stress was observed more at the entry level and exit level of the academic course [(14)]. Stress management programs and time management sessions at the beginning of every year followed by mental health education would lessen the burden to a greater extent. In this regard, the importance of extra-curricular activities, sports and cultural meets in alleviating stressful states cannot be ignored.

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