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Prevalence of stress, stressors, and coping strategies among medical undergraduate students in a medical college of Mumbai

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Abstract:

BACKGROUND: Stress is a subjective experience which creates an obstacle in a person's path of achieving his or her goals. It creates negative outcomes among the population. Medical curriculum is very vast and stressful. As doctors are the very important part of society, medical students must be allowed to learn their trade in a stress-free environment. The present study aimed to assess the perceived stress, various sources of stress among medical undergraduate students, and the coping strategies adopted.

MATERIALS AND METHODS: This was a cross-sectional study conducted among medical under-graduate students studying at a tertiary care hospital situated in Mumbai city of Maharashtra between January and June 2018. Using purposive sampling technique, a total of 450 medical students from 1st year to final year were invited to participate in the study. A self-administered questionnaire consisting of sociodemographic details and perceived stress scale questions was used. Logistic regression analysis was carried out to assess the determinants of stress. Odds ratio, 95% confidence interval was calculated. $P < 0.05$ was considered statistically significant.

RESULTS: The overall response rate was 79.11%, with 356 out of 450 students returning the questionnaire. Among 356 participants, 324 participants (91%) were suffering from high levels of stress. Factors such as curriculum vastness, frequency of examination, competition with peer, performance in examinations, worry about future, loneliness, relation with opposite sex, and quality of food played a major role in creating additional stress.

CONCLUSIONS: The perceived stress was higher among female medical students. Academic factors are greater perceived cause of stress in medical students in this study. A substantial proportion of medical undergraduate students were found to be stressed which necessitates appropriate and timely interventions. Reframing the academic curriculum along with examination and evaluation patterns, incorporating extracurricular activities, and establishment of counselling cells in the institution is the need of the hour.

Keywords:

Coping strategies, Maharashtra, medical students, perceived stress scale, stress, stressors

Introduction

Stress is a subjective experience which cannot be avoided as it results from intricate interactions between an individual and his or her environment. It usually occurs when a person's situational demand exceeds

that of his resources.^[1] Excessive stress has also been reported to result in reduced self-esteem, as well as affect academic achievement and personal and professional development.^[2]

Medical curriculum is very vast and demanding and has been recognized

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as very stressful that can have a negative impact on the student's well-being.^[2] Life as a medical student calls for complete commitment and responsibility toward academic tasks and care provided to patients. The prevalence of stress among medical students has been reported in various studies between 20.9% and 94.5%.^[1,3-6] The various stressors among medical students involve the factors such as vastness of academic curriculum, clinical duties, long emergency duties, staying away from family, examination system, and administration.^[7] Stress is known to decrease the sustained attention, decision-making ability, and overall judgment of an individual that can impact the academic performance considerably.

Coping is generally regarded as a stabilizing factor that assists an individual in adapting to various stressful events. Coping methods often used by medical students, to reduce level of stress include, effective time management, social support and engagement in leisurely pursuits such as internet browsing, watching movies, and playing games.^[8]

Previous research findings demonstrate that, early career stress among medical professionals predicts the late life stress associated with their profession and job satisfaction.^[5,7] Therefore, assessments of exposure to different types of stressors among medical students becomes timely to target specific health promotion activities. Although a few studies have been conducted in India on exploring the stressors and coping strategies adopted by medical undergraduates, there is a dearth of more extensive work.^[8-10]

Keeping these facts into consideration, the current study aimed to assess the perceived stress, various sources of stress among medical undergraduate students, the coping strategies adopted to tackle stress, and to find an association of perceived stress with sociodemographic characteristics and various stressors and suggest appropriate and timely interventions.

Materials and Methods

Study design and setting

This was a cross-sectional study conducted among medical undergraduate students studying at a tertiary care hospital situated in Mumbai city of Maharashtra between January and June 2018.

Study participants and sampling

A total of 450 bachelor of medicine and bachelor of surgery (MBBS) students from 1st year to final year Part I were studying in this college. Purposive sampling technique was used, and all the MBBS students from first year till final year Part I (there were only these

three batches of medical undergraduate students in the institute at the time of study) were invited to participate in the study.

Data collection tool and technique

The students who consented to participate in the study were asked to complete the self-administered questionnaire consisting of parts on sociodemographic profile and Perceived Stress Scale (PSS). PSS was developed by Cohen *et al.*^[11] The PSS is a 14-item scale that includes various questions about participants' stressful thoughts related to various life situations within the last month. Each item is rated on a 5-point answer scale ranging from 0: "never" to 4: "very often." The total PSS scores were computed by reversing the scores on the seven positive items, and then, adding the responses to all 14 items for each participant. Questions 4, 5, 6, 7, 9, 10, and 13 were the positively stated items. The PSS scores ranged from 0 to 56, with the higher scores indicating lower levels of stress. The PSS has an internal consistency of 0.85 (Cronbach's α coefficient) and test-retest reliability during a short retest interval (several days) of 0.85.^[11] In this study, the median perceived stress score of the observations was taken as the operational cutoff value.

Sources of stress were listed and categorized into (a) academic stressors – dissatisfaction with lecture, vastness of academic curriculum, frequency of examination, competition with the peer group, fear of failure or poor performance in examination, and lack of recreation; (b) psychosocial stressors-worry about future, high parental expectation, loneliness, family problem, financial problem, relation with opposite sex; and (c) environmental stressors-traveling between college and home, accommodation away from home, quality of food in mess/home, living conditions in hostel/home, living conditions in hostel/home, and adjusting with roommates/neighbors.

Data were entered into excel sheet as codes and were analyzed using IBM SPSS Statistics for Windows, Version 21.0. Armonk, NY. Descriptive statistics were used to describe the sociodemographic characteristics, perceived stress, and sources of stress. Sociodemographic characteristics and sources of stress were expressed in percentage. The mean scores of perceived stress were calculated. Logistic regression analysis was carried out to assess the determinants of stress. Odds ratio, 95% confidence interval was calculated. $P < 0.05$ was considered statistically significant.

Ethical consideration

Institutional ethical clearance was obtained. The purpose of the study was explained to the students, and an informed consent was obtained. Anonymity of participants was maintained in our study.

Results

Of 450 students, 356 completed and returned the questionnaire giving an overall response rate of 79.11%. The majority of the respondents were male (56.74%). Most of the medical students studied in private schools (66.85%), and the most common medium of education was English (82.02%). Hostellers (62.35%) outnumbered the day scholars (37.64%). The mean perceived stress score was 27.70 ± 6.792 . The median perceived stress score of the observations was 27. Mean perceived stress score among female and male medical students was 29.44 ± 6.85 and 26.4 ± 6.81 , respectively. The sources of stress were categorized into three types, namely academic stressors, psychological stressors, and environmental stressors [Table 1].

Among the 356 participants, the majority (68.5%) were finding the vastness of the academic curriculum as the main source of stress academically, which led to poor performance and a fear of failure in 52.2% participants, while lack of recreation was the source of stress in 42.1% of participants. Among the psychosocial stressors, 65.2% participants were worried about their future, whereas in 46.6% participants, stress affected their performance in practical examinations. 39.9% participants were found to be stressed as they felt overburdened by the expectations. Moreover, the quality of food in mess/hostels (46.1%) and staying away from home (33.7%) contributed as the environmental sources of stressors.

Sociodemographic determinants of stress were analyzed by using logistic regression [Table 2].

Logistic regression analysis showed that gender was an important sociodemographic determinant of stress ($P < 0.01$) with females having mean PSS much greater than males. Age ($P = 0.06$), schooling ($P = 0.903$), medium of education ($P = 0.543$), year of pursuing M. B. B. S. (0.824), and being a day scholar or hosteller ($P = 0.3111$) had no significant influence on stress level [Table 2].

Academic, psychosocial, and environmental determinants of stress were analyzed by using logistic regression [Table 3].

Academic stressors are the most important reason for increased stress among medical undergraduates. Vastness of academic curriculum ($P = 0.042$), frequency of examination ($P < 0.001$), competition with peer ($P < 0.001$) fear of failure or poor performance in examination ($P = 0.066$), worry about future ($P = 0.002$), and performance in theory and practical examinations ($P = 0.007$ and 0.04 , respectively) were the important determinants of stress.

The major significant psychosocial stressors were loneliness ($P = 0.001$) and relation with opposite sex ($P = 0.003$). Quality of food in mess/home ($P = 0.019$) was an important environmental stressor that was a significant predictor of stress [Table 3].

Table 1: Sources of stress (n=356)

Sources of stress	Number of respondents, yes, n (%)
Academic stressors	
Dissatisfied with lecture	124 (34.8)
Vastness of academic curriculum	244 (68.5)
Frequency of examination	82 (23)
Competition with the peer group	142 (39.9)
Fear of failure or poor performance in examination	186 (52.2)
Lack of recreation	150 (42.1)
Psychosocial stressors	
Worry about future	232 (65.2)
Performance in theory	142 (39.9)
Performance in practical	166 (46.6)
Expectations	148 (41.6)
High parental expectation	68 (19.1)
Loneliness	102 (28.7)
Family problem	58 (16.3)
Financial problem	58 (16.3)
Relation with opposite sex	80 (22.5)
Environmental stressors	
Travelling between college and home	102 (28.7)
Accommodation away from home	120 (33.7)
Quality of food in mess/home	164 (46.1)
Living conditions in hostel/home	102 (28.7)
Adjusting with roommates/neighbors	102 (28.7)

Table 2: Sociodemographic determinants of stress among medical undergraduate students

Sociodemographic characteristics	OR (95% CI)	P
Age (years)		
≥20	2.062 (0.970-4.386)	0.060
<20	1 (reference)	
Gender		
Female	0.490 (0.312-0.770)	0.002
Male	1 (reference)	
Schooling		
Public	0.971 (0.604-1.560)	0.903
Private	1 (reference)	
Medium of education		
Others	1.205 (0.660-2.202)	0.543
English	1 (reference)	
MBBS Year		
Final M.B.B.S. Part-I	1.053 (0.666-1.666)	0.824
First and Second year	1 (reference)	
Day scholar/hosteller		
Hosteller	0.784 (0.489-1.255)	0.311
Day scholar	1 (reference)	
Batch		
Additional	0.509 (0.061-4.227)	0.532
Regular	1 (reference)	
Father's occupation		
Doctor	1.090 (0.499-2.384)	0.828
Others	1 (reference)	
Mother's occupation		
Doctor	1.535 (0.638-3.691)	0.339
Others	1 (reference)	

Statistical analysis used-Logistic regression. OR=Odds ratio, C.I=Confidence interval

Coping strategies adopted by medical students to relieve stress are shown in Table 4.

Pursuing their hobbies (28.08%) was the most common strategy employed by the students to relieve stress followed by listening to music (27.52%), while 24.71% of them were not involved in any activity to cope up with stress.

Discussion

Various studies published in different parts of the world have reported higher stress levels (>50%) among medical students.^[6,8,9,12-14] However, the higher stress levels reported in 91% of students in our study are much higher than that reported by others. Similar to the high mean PSS score observed in the current study, high mean PSS score has also been observed in the studies conducted among medical students in the medical colleges of Kolkata and Mangalore.^[1,15] The mean PSS score was higher among female medical students than male students, and the association of female sex with stress was statistically significant. This finding was corroborated in various other studies on medical students.^[15-20] This finding may

Table 3: Academic, psychosocial, and environmental determinants of stress among medical undergraduate students

Stressors	OR (95% CI)	P
Dissatisfied with lecture	0.919 (0.508-1.662)	0.781
Vastness of academic curriculum	0.534 (0.292-0.979)	0.042
Frequency of examination	0.284 (0.141-0.572)	<0.001
Competition with peer	3.310 (1.843-5.948)	<0.001
Fear of failure	0.540 (0.280-1.042)	0.066
Lack of recreation	1.245 (0.717-2.160)	0.437
Worry about future	2.557 (1.432-4.568)	0.002
Performance in theory	2.585 (1.301-5.138)	0.007
Performance in practical	1.939 (1.031-3.645)	0.040
Expectations	1.343 (0.766-2.354)	0.304
Parental expectations	1.223 (0.573-2.612)	0.603
Loneliness	3.108 (1.606-6.013)	0.001
Family problem	1.392 (0.573-3.381)	0.465
Financial problem	0.979 (0.404-2.371)	0.962
Relation with opposite sex	2.942 (1.448-5.977)	0.003
Travelling from college to home	0.594 (0.320-1.106)	0.100
Accommodation away from home	1.064 (0.567-1.995)	0.847
Quality of food	0.428 (0.210-0.870)	0.019
Living conditions	0.693 (0.353-1.358)	0.285
Adjustments with roommates/ neighbors	1.879 (0.900-3.921)	0.093

Statistical analysis used-Logistic regression. OR=Odds ratio, CI=Confidence interval

be attributed to the fact that females in general are more susceptible of suffering from various levels of stress.^[21] In another study by Rani *et al.*, it was found that females perceived more stress in competitive environment and had greater conflicts.^[8]

In our study, the year of studying M. B. B. S., the school (public/private) where the students pursued their education and the medium of education had no influence on stress. In a study conducted among medical students in Pakistan, medium of education, being a hosteller or day scholar, had no significant association with stress level.^[17] Similarly in the study by Elizabeth Rani *et al.*, it was found that being a hosteller or a day scholar did not have significant association with stress.^[8] While in several other studies, it was found that the final year students were more at stress than other years.^[22-24] The difference in the results observed in our study could be due to the fact that there was no Final year Part II batch studying in the institute at the time of the study.

In our study, vastness of academic curriculum, frequency of examination, competition with peer, fear of failure or poor performance in examination, worry about future, and performance in theory and practical examinations were the important determinants of stress. Hence, academic stressors were greater perceived causes of stress in medical students in our study. This was similar to the findings reported by various others studies.^[1,8,10,15,17,20,23,25-28]

Table 4: Various coping strategies adopted by students to tackle stress (n=356)

Coping strategies	Frequency, n (%)*
Hobbies (dancing/singing/playing musical instruments/swimming/bike racing/sketching/reading)	100 (28.08)
Listening to music	98 (27.52)
None	88 (24.71)
Playing games (outdoor/indoor)	80 (22.47)
Yoga/zumba/meditation/exercise/gym	58 (16.29)
Watching TV (TV series, serials, or shows)	54 (15.16)
Sleeping	52 (14.60)
Hanging out with friends	32 (8.90)
Going out for movies	24 (6.70)
Eating junk/chocolate/binge eating	22 (6.17)
Internet/social media	20 (5.60)
Watching motivational videos	18 (5.05)
Spending alone time	10 (2.80)
Travel	8 (2.24)
Screaming/crying/laughing	6 (1.68)
Chanting holy name	6 (1.68)
Visiting psychiatrist	4 (1.12)
Shopping	4 (1.12)
Going home	2 (0.56)
Cold water bath	2 (0.56)

*Many students adopted multiple coping strategies

The significant psychosocial stressors found in the present study were loneliness and relation with opposite gender. In a study conducted among medical students in Mangalore, it was found that high parental expectations and loneliness are the determinants for stress.^[15] Various other studies also reported psychosocial factors as important stressors among medical students.^[19,23,29] Quality of food was found to be an important determinant of stress in our study. Similar to our results, the quality of food in mess, emerged out as an important stressor among students in a medical school in Kathmandu.^[26] Travel, accommodation away from home, adjustment with peers, and living conditions had no significant influence on stress level.

Our study also included the type and measure of stress coping skills adopted by the medical students, pursuing their hobbies was the most common strategy employed by the students to relieve stress followed by listening to music while nearly one-fourth of them were not involved in any activity to cope up with stress. Other common coping strategies to tackle stress were playing games, doing yoga or zumba or meditation or exercise or gym, watching TV, and sleeping to overcome their stress. Similar results have been obtained in a study on medical students by Rani *et al.*^[8]

High prevalence of stress among medical students is a reason to worry as it may influence behavior of students, hamper their learning, and affect patient care after their graduation.^[5] The students should be taught various stress management techniques to improve

their ability to cope with the demanding professional course. Stress load of students can be taken care by motivating them to participate in extracurricular activities. Competency-based curriculum can be used as an alternative model of teaching and assessment.^[30-32] Planning must be done to address the stress levels as with increasing semesters, the level of toughness of course also increases. This leads to added burden on students.^[33]

This was a cross-sectional study conducted using a self-administered questionnaire, hence there is a possibility of information bias. Moreover, the study was limited to one medical college, and hence, the results may not be generalizable. Reporting bias may have resulted as perceived stress, and its causes were self-reported by students. In spite of the fact that secrecy was guaranteed, medical students may have misrepresented or underreported stress or coping strategies in view of dread of being singled out.

Conclusions

Academic factors are greater perceived cause of stress in medical students in this study. Interventions must be developed to target the particular stressors to reduce the burden on students. The students should be taught various stress management techniques to improve their ability to cope with the demanding professional course. Various programs should be implemented to reduce the stress burden right from the 1st year itself. Teaching stress management and self-care skills to medical students become essential. Stress load of students can be taken care by motivating them to participate in the

extracurricular activities. Special cells involving various faculties can be formed in the medical colleges to address stress concerns of the medical students. Workshops on skill development, time management, and career counseling should be arranged.

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Conflicts of interest

There are no conflicts of interest.

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