RESEARCH ARTICLE

PREVALENCE OF STRESS AND ITS ASSOCIATION WITH RESILIENCE AMONG MEDICAL STUDENTS IN A TERTIARY CARE CENTER, AURANGABAD, MAHARASHTRA, INDIA

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Manuscript Info

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Abstract

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Background: Medical science is perceived as a stressful educational career, and medical students experience monstrous stress during their undergraduate studies and internships because of its depth and competitiveness. Prolonged stress can cause health problems, hamper academic achievements, and affect patient care.
Objectives: The present study aimed to assess the prevalence of stress and its association with resilience, as well as the coping strategies adopted by medical students.
Material & Methods: This was a cross-sectional study conducted among medical undergraduate students studying at a tertiary care hospital situated in Aurangabad, Maharashtra, between June and July 2022. Using Cochran's formula and the previous study's prevalence of 51.1%, 425 medical students from first year to internship were included. A self-administered questionnaire consisting of Sociodemographic characteristics, items from the Kessler 10 inventory, and the BRIEF resilient coping scale were used.
Results: The overall response rate was 79.11%, with 380 out of 425 students returning the questionnaire. The study found that 57.6% of medical students were suffering from high levels of stress, and the highest prevalence was among the 1st year students, followed by the internship students, and then the final year students. Stress was classified as mild (13.9%), moderate (8.9%), severe (34.7%), or likely to be well (42.4%) on the Kessler 10-item inventory scale. Academic factors are a greater perceived cause of stress. The religion, present address, medium of education and BRCS coping score had significant impact on presence of stress.(p=0.027, p=0.03, p=0.001,p=0.001)
Conclusion: The study recommended that consideration be given to program decision-makers and health decision-makers to focus on significant actions to reduce the academic stress perceived by medical students. Preventive mental health services could be made an integral part of routine clinical services for medical students, especially in the initial academic years, to prevent such occurrences.

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Introduction:-

Studying medicine is stressful.Medical science is perceived as a stressful educational career, and medical students experience monstrous stress during their undergraduate studies and internship because of its depth and competitiveness.[1,2] Numerous studies have discussed the stressors that medical students must deal with. The body's general reaction to demands placed on it or upsetting occurrences in its surroundings is called stress.[3, 4] It helps us feel and respond to environmental hazards and difficulties. [5]

"Stressors" are situations that stress people out. The emotional changes or disturbances that stressors cause are referred to as "stress." Stress comes in two forms. Positive stress encourages learning, whereas negative stress prevents it. Depending on their innate abilities, medical students may interpret the same pressures in different ways. Students' self-esteem, academic performance, and professional advancement are all negatively impacted by excessive stress.[6,7]

Studies carried out in the United States have shown that studying medicine puts competent medical students at risk for psychological morbidity, which occurs at various phases of training.[8-11] In a research study conducted in Singapore, 57% of law students and 47.3% of medical students had experienced emotional disturbance based on GHQ results.[12] Another study conducted in Turkey found that mental disorders were present in 47.9% of medical students, compared to 29.2% of students in economics and physical education. [13]

These facts suggested a situation of elevated psychological pressure on medical students. Studies have also shown that chronic exposure to stress is associated with anxiety and depression, interpersonal conflict, sleep disturbances, and poor academic or clinical performance.[14,15] Stress was also found to decrease the quality of attention, concentration, and decision-making and reduce the students' abilities to establish good relationships with patients. [16]

Therefore, this study aimed to estimate the prevalence of stress and its association with resilience among medical students in a tertiary care center in Aurangabad, Maharashtra.

Aim and objectives:-
1. To estimate the Prevalence of stress and its association with resilience.
2. To assess coping strategies adopted among Medical Students.

Material and Methods:-
Study design:
A Cross Sectional study.

Study setting:
The present study was conducted at a tertiary care center of Aurangabad city of Maharashtra, India.

Study duration:
1 Month (June 2022 to July 2022).

Sample size:
The sample size was calculated using purposive sampling and the prevalence of stress among medical students from the previous study done by Goval P.et al[17] in South Gujarat, which was 51.1%.Using the Cochran formula, the sample size was calculated to be 383 with a precision of 5%. The study included 425 students after accounting for the nonresponse rate.

Study population:
The study included all MBBS and internship students studying in a tertiary care center.

Inclusion criteria:
All the MBBS students from their first year through their internship.

Exclusion criteria:
1. Unwillingness to participate in the study; and 2. Incomplete answers.

Data Collection and Questionnaire:
A pre-tested and semi-structured questionnaire consisting of Sociodemographic characteristics, items from Kessler 10 inventory[18] and BRIEF Resilient coping scale [19]were used. To maintain data quality the questionnaire was pretested on 30 medical students.

Study procedure:
A Google form consisting of all these items sent on whatsapp group of each batch after lectures. Also form was sent on their groups twice in a week as a reminder to students during the study period. The students were allowed to respond in their own time and privacy. The participation was entirely voluntary. Those who filled incomplete questionnaire were excluded from study.

Study tools:
The study was conducted using Kessler10 psychological distress (K10) inventory developed by Kessler and colleagues, which measures the level of stress according to none, mild, moderate, and severe categories. This instrument has been used widely in population-based epidemiological studies to measure current (1-month) distress. The World Mental Health Survey of the World Health Organization used it as a clinical outcome measure. [20]

The K10 consists of 10 questions in the form of "how often in the past month did you feel ..." and offers specific symptoms, such as 'tired out for no good reason', 'nervous', and 'sad or depressed'. The five possible responses for each question ranged from 'none of the time' to 'all of the time' and were scored from 1 to 5 respectively. All the questions were collated to obtain a total score. The total score was interpreted as follows: a score of less than 20 was considered not to represent stress of any level while a score of 20-24 represented mild stress, 25-29 represented moderate stress, and 30- 50 represented severe stress.[21] The questionnaire also had additional questions relating to academic achievement, sources of stress, and any perceived medical illness. The K10 questionnaire was observed to have good psychometric properties with a Cronbach's alpha of 0.934. [18]

Another instrument used for measurement of resilience was BRIEF Resilient coping scaleby Sinclaire and Wallston (2004).Resilience refers to the ability of people to 'bounce back' when they encounter difficulties.It consists of 4 statements which consider how well the given statements describe participant's behavior and actions. The 5 possible responses for each question ranged from 'does not describe me at all' to 'describe me very well' and were scored from 1 to 5 respectively. Interpretation of this scale consist of score range from 4-13 points for Low resilient copers, 14-16 points for Medium resilient copers and 17-20 points for High resilient copers.[19][Cronbach's alpha of 0.823]

Data entry and analysis:
The data were entered in Microsoft Excel and analyzed by using SPSS trial version 26. The outcome variable "stress" was dichotomized as "yes" or "no." The three levels (mild, moderate, and severe) of stress were put into one category and titled 'presence of stress-yes'. Descriptive statistics (mean, standard deviation, and percentages) were used for summarizing the study and outcome variables. A univariate regression analysis was done for different study variables. The Chi-square test determined that the correlation between various variables was significant when p value <0.05.

Approval for the study:
Written approval from the institutional ethics committee was obtained beforehand. After obtaining informed verbal consent from all MBBS students and interns studying in a tertiary care center, they were included in the study.

Results:-
The overall response rate was 79.11%, with **380** out of 425 students returning the questionnaire. The students' mean age was 21.6 (2.1) years, with a range of 18-32 years. Out of the total 380 students, 198 (52.1%) were female and 182 (47.9%) were male. Among all respondents, 106 (27.9%) were first-year MBBS students, 48 (12.6%) were second-year students, 48 (12.6%) were third-year students, 87 (22.9%) were final-year students, and 91 (23.9%) were interns.

The mean score for the Kessler scale was 25.33±9.95. In the present study, the prevalence of stress at all levels was about 57.6%. However, the prevalence of severe stress was 34.7%, moderate stress was 8.9%, and mild stress was 13.9%. (Fig. 1 & Fig. 2)

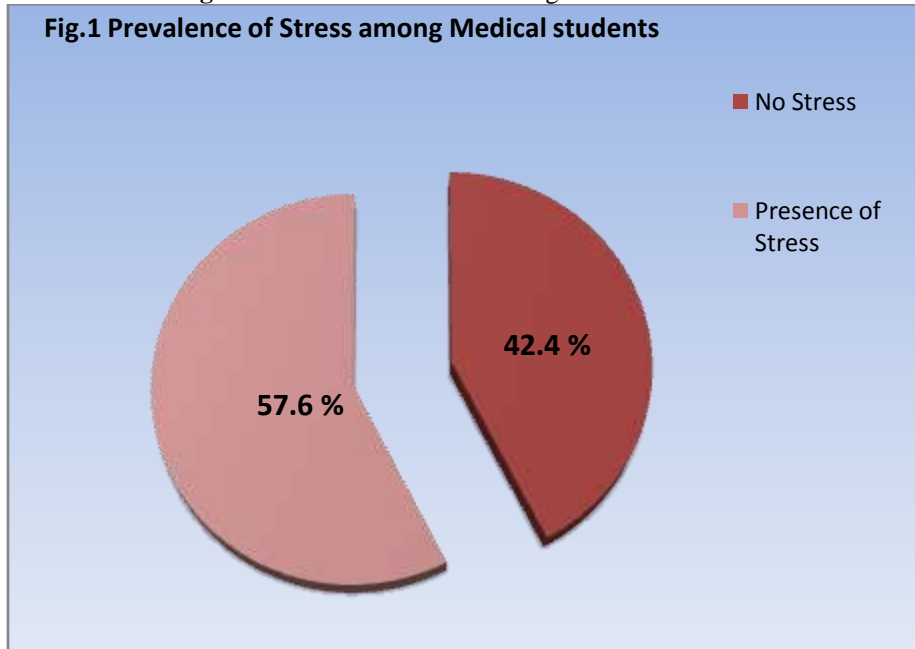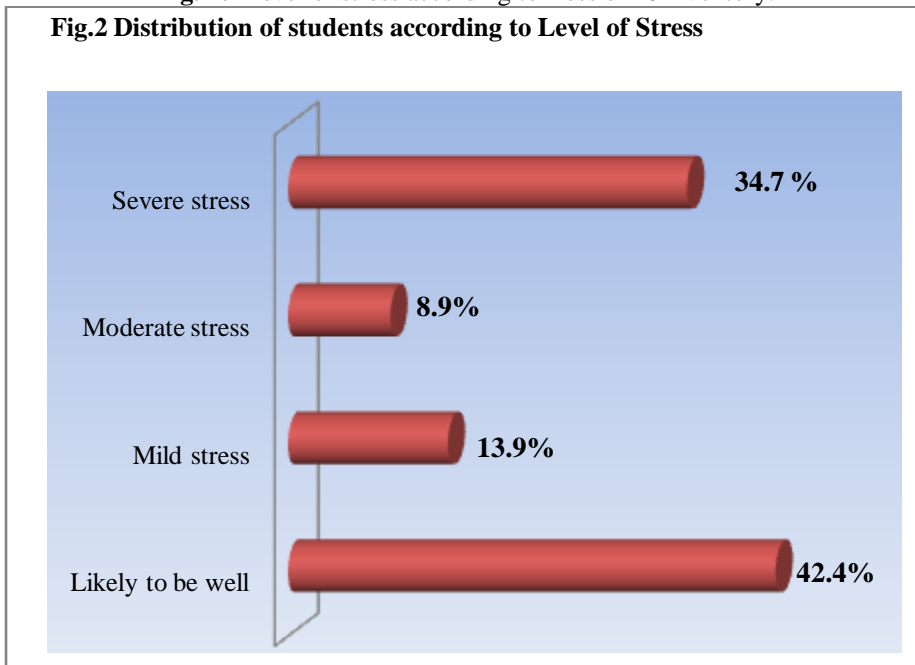**Fig. 1:-** Prevalence of Stress among Medical students.

Fig. 2:- Level of stress according to Kessler 10 inventory.

The Sociodemographic characteristics of the study participants and their association with the presence of stress are shown in Table 1. The prevalence of stress was the highest (80%) among the students in the age group 26–30 years compared to their counterparts without statistical significance (p=0.1). There was no significant association between gender and the presence of stress. (p=0.06). Female students had a higher proportion of stress (62%) than male

students (52.8%). Religion had a significant impact on the presence of stress. Students of the Muslim religion had higher stress (78.3%) compared to students belonging to Hindu (56.2%), Buddhist (70.6%), and other religions (45.2%).

Also, the present address of students had a significant impact on the presence of stress (p = 0.003). Students living in flats or rooms experienced more stress (67%) than hostel residents (59.4%) or local residents (51.4%).The association between the permanent addresses of the students and the rate of stress was not significant (p = 0.17). The distribution of stress levels was found to be significantly associated with the level of education. The prevalence of stress was the highest among the 1st-year students (64.1%), followed by the interns (58.4%), the final year (55.9%), the 2nd year (53.5%), and the 3rd year (47.1%). There was no significant association between the study year and stress levels. (p=0.49).

Table 2 shows the association of behavioral factors and resilience with the presence of stress. The presence of any health issue, duration of sleep, and duration of work were not significantly associated with the presence of stress among the students (p = 0.51, p = 0.05, p = 0.31). The students with health issues had 61.2 % more stress than students without any health issues (56.9%). Stress was more prevalent in students who slept for 6 hours compared to students who slept for 6–8 hours (54.3%) and 9–11 hours (66.7%). The prevalence of stress was higher in students who worked for more than 13 hours per day (75%), followed by work durations of 8 hours (58.6%), 8–10 hours (56.3%), and 11–13 hours (46.2%). The brief resilience coping scale score had a significant impact on the presence of stress among medical students (p = 0.001). The mean score was 14.63.55. Students who experienced more stress (68.8%) were less resilient than their peers. Students who were moderate copers experienced 67.5% stress, while high copers experienced 38.5% stress.

Table 1:- Association of sociodemographic variables with the presence of stress.

Study variables	Category	Presence of stress		Total N (%)	Chi-square value
		No[N (%)]	Yes[N(%)]		
Age	<20	49 (48)	53 (52)	102 (100)	X^2_2=4.509, p=0.105
	21-25	109 (41.4)	154 (58.6)	263 (100)	
	26-30	3 (20)	12 (80)	15 (100)	
Gender	Male	85 (47.2)	95 (52.8)	180 (100)	X^2_1=3.300, p=0.069
	Female	76 (38)	124 (62)	200 (100)	
Religion	Hindu	123 (43.8)	158 (56.2)	281 (100)	X^2_3=9.215, **p=0.027***
	Muslim	5 (21.7)	18 (78.3)	23 (100)	
	Buddhist	10 (29.4)	24 (70.6)	34 (100)	
	Other	23 (54.8)	19 (45.2)	42 (100)	
Present Address	Hostelite	41 (40.6)	60 (59.4)	101 (100)	X^2_2=6.574, **p=0.037***
	Localite	87 (48.6)	92 (51.4)	179 (100)	
	Flat/room	33 (33)	67 (67)	100 (100)	
Permanent address	Rural	51 (37.8)	84 (62.2)	135 (100)	X^2_1=1.807, p=0.179
	Urban	110 (44.9)	135 (55.1)	245(100)	
Medium of Education	English	132 (47.8)	144 (52.2)	276 (100)	X^2_2=14.924, **p=0.001***
	Semi English	13 (39.4)	20 (60.6)	33 (100)	
	Marathi/Hindi	16 (22.5)	55 (77.5)	71 (100)	
Designation	1st year	37 (35.9)	66 (64.1)	103 (100)	X^2_4=3.383, p=0.496
	2ndyear	20 (46.5)	23 (53.5)	43 (100)	
	3rd year	18 (52.9)	16 (47.1)	34 (100)	
	Final year	49 (44.1)	62 (55.9)	111 (100)	
	Intern	37 (41.6)	52 (58.4)	89 (100)	

Figures in parenthesis indicate row wise percentages.

Table 2:- Association of behavioral factors with the presence of stress.

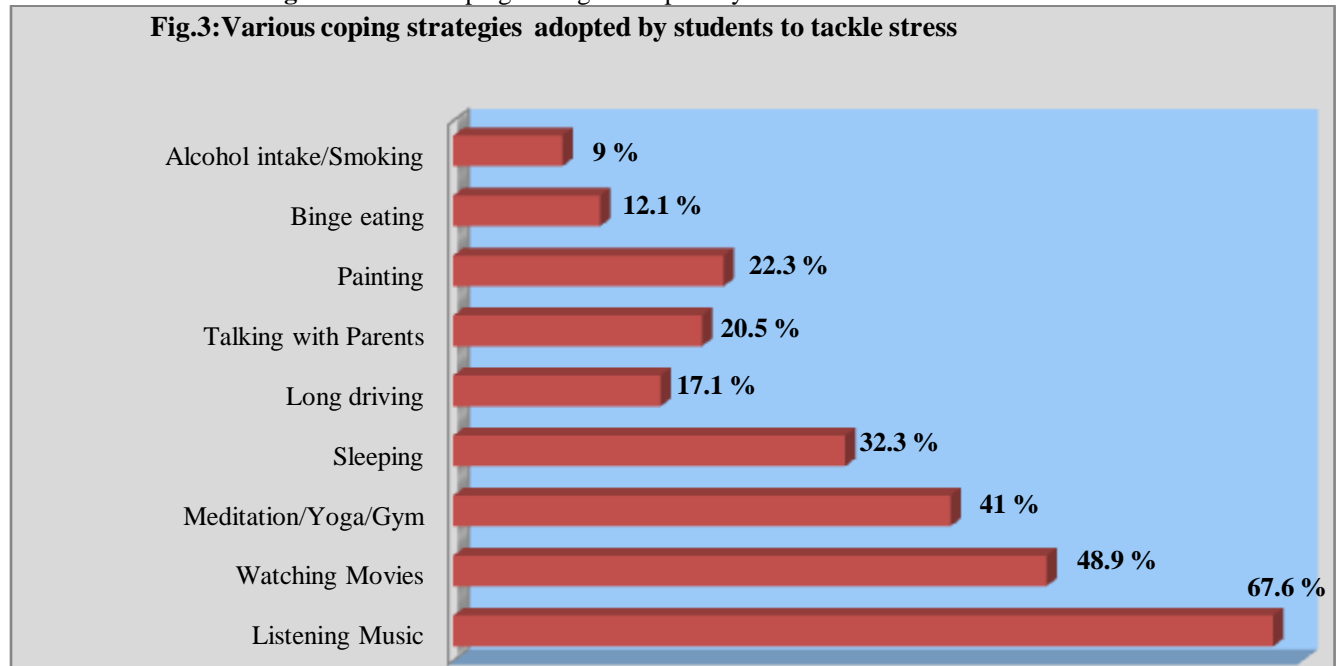| Study variables	Category	Presence of stress		Total	Chi-square value
		No N (%)	Yes N (%)	N (%)	
Health issue	Yes	26 (38.8)	41 (61.2)	67 (100)	$X^2_1=0.423$, p=0.516
	No	135 (43.1)	178 (56.9)	313(100)	
Sleep duration	<6hr	25 (30.9)	56 (69.1)	81 (100)	$X^2_2=5.950$, p=0.051
	6-8hr	134 (45.7)	159 (54.3)	293 (100)	
	9-11hr	2 (33.3)	4.0(66.70)	6 (100)	
Work duration	<8 hour/day	84 (41.4)	119 (58.6)	203 (100)	$X^2_3=3.559$, p=0.313
	8-10hour/day	59 (43.7)	76 (56.3)	135 (100)	
	11-13 hour/day	14 (53.8)	12 (46.2)	26 (100)	
	>13 hour/day	4 (25)	12 (75)	16 (100)	
BRCS (Brief Resilience Coping scale) Scoring	High (17-20)	83 (61.5)	52 (38.5)	135 (100)	$X^2_2=31.369$, **p=0.000****
	Moderate (14-16)	39 (32.5)	81 (67.5)	120 (100)	
	Low (4-13)	39 (31.2)	86 (68.8)	125 (100)	

Figures in parenthesis indicate row wise percentages.

Table 3:- Different sources of stress in medical students.

Different sources of Stress in medical students		Frequency (n)	Percent (%)
Academic	Vast syllabus for study	214	56.3
	Difficulty in understanding	152	40
	Lack of appreciation	124	32.6
	No time for recreational activities	95	25
	Preparation of future exam	276	72.6
Psychosocial	Worried about future	132	34
	Fear of failure in exam	170	44.7
	Conflicts with colleague	87	22.8
	Relationship problems	98	25.7
	Family obligations	56	14.7
	Loneliness/Home sickness	89	23.4
	Financial problems	70	18.4
Environmental	Living condition in Hostel	145	38.1
	Quality of food in mess	124	32.6
	Adjustment with Roommates	112	29.4

*Multiple responses are considered.

Table 3 shows different sources of stress among medical students. They are classified as academic, psychosocial, and environmental stressors. The top three sources of stress among all students are exam preparation (72.6%), exam failure (44.7%), and living conditions in the hostel (38.1%) in all three categories. Figure 3 shows various coping strategies adopted by students to tackle this stress. Students' most common strategies were listening to music (67.6%) and watching movies (48.9%). Others were meditation/yoga/gym (41%), sleeping (32.3%), talking with parents (20.5%), etc.

Fig. 3:- Various coping strategies adopted by students to tackle stress.

Fig.3: Various coping strategies adopted by students to tackle stress

(Bar chart values:)
- Alcohol intake/Smoking — 9 %
- Binge eating — 12.1 %
- Painting — 22.3 %
- Talking with Parents — 20.5 %
- Long driving — 17.1 %
- Sleeping — 32.3 %
- Meditation/Yoga/Gym — 41 %
- Watching Movies — 48.9 %
- Listening Music — 67.6 %

Discussion:-

A high prevalence of stress among medical students is a cause for concern as it may impair their behavior, diminish their learning, and ultimately affect patient care after their graduation. The overall prevalence of stress in this study (57.6%) is similar to the Wahed WY et al.[21] study (62.4%)and Abdulghani H. et al [22] study (63%) but higher than a study by Goyal P. et al [17] in South Gujarat (51.1%) and lower than a study by Chandalwala U. et al in Mumbai (91%).[23]The present study revealed females were more stressed than males. This result was similar to the study done by Chadalawada U.et al in Mumbai [23] and Sadiq A.et al in Faisalabad. [24]

In the present study, first-year students were more stressed, then stress decreased for the 2nd and 3rd years gradually and increased during the final year and internship. Similar results were observed in the Abdulghani H. et al study [22] and the Attiya M. et al study. [25] However, contrary results were observed, i.e., 2ndand 3rd-year students had a higher prevalence of stress than others in the studies done by Yusoff M. et al [26]andSani M. et al. [27]In the present study, stress levels were higher among hostel students than in the locality, which was similar to the study by Shah C. et al. [28] They discovered that students who spoke Marathi or Hindi had more stress than English-medium students. These findings contradict those of the Supe AN et al study. [29]

The BRCS score revealed that 68.8% of students were low-resilient, which was found to be significant in this study. Academic factors, such as exam preparation (72.6%) and a large study syllabus (56.3%), are the main sources of stress in the present study. Similar results were reported by the Rock B. et al. study [30] and the Joseph N. et al. study.[31] Listening to music and watching movies are the most common coping strategies adopted by students to tackle stress. The Chadalawada U et al. study found similar results. [23]

Since stress affects students' behavior, learning, and patient care after graduation, it is concerning that medical student's experience such a high prevalence of stress. To help the student's better handle the demanding professional course, a variety of stress management techniques should be offered. Encourage students to participate in extracurricular activities to reduce their stress levels.[32]

This was a cross-sectional study conducted using a self-administered questionnaire; hence, there is a chance of information bias. Furthermore, because the study was restricted to a single medical college, it is possible that the results cannot be generalized. The possibility of reporting bias exists, and students self-reported its causes. Despite the provision of confidentiality, medical students may have exaggerated or underreported stress or coping mechanisms out of fear of being singled out.

Conclusion:-

The prevalence of stress was high in our study subjects with low resilience.One of the most effective ways to prevent stress is by helping students in developing resilience. As resilience is a dynamic process, it is very essential to include resilience-building strategies in the medical curriculum like mental health screening, sensitive workplace infrastructure, peer support, nutrition, etc.Ongoing needs include reframing the academic curriculum, as well as examination and evaluation patterns, incorporating extracurricular activities, and establishing counseling cells in campus.

Acknowledgment:-

Conflicts of interest:
There are no conflicts of interest.

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