Original Research Article

A COMPARATIVE STUDY OF PREVALENCE OF STRESS AMONG UNDERGRADUATE MEDICAL STUDENTS

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A B S T R A C T

Background: Elevated stress levels among medical students pose significant challenges, impacting both academic performance and overall well-being. This study is aimed to investigate and compare stress levels of medical students across different academic years studying at Kanyakumari Government Medical College. The objectives of the study are to compare the prevalence of stress among all phases of undergraduate medical students, to examine the association between stressor domains and the year of study and to assess the extent of perceived stress using the Medical Student Stress Questionnaire (MSSQ).
Materials and Methods: A cross-sectional study was conducted among MBBS students across all four academic years, utilizing the MSSQ to assess stress in six domains: Academic Related Stress (ARS), Intrapersonal and Interpersonal Related Stress (IRS), Teaching and Learning Related Stress (TLRS), Social Related Stress (SRS), Drive and Desire Related Stress (DRS), and Group Activities Related Stress (GARS).
Results: A total of 538 students participated. Statistical analysis revealed a significant difference in DRS scores, with first-year students exhibiting higher stress levels compared to final-year students (p=0.002). No significant differences were observed in the remaining stress domains.
Conclusion: First-year students experience heightened DRS, likely due to challenges in adapting to medical education and career-related uncertainties. Targeted interventions are necessary to support first-year students in stress management.
Keywords: Stress, Stressors, Undergraduate Medical Students, MSSQ, Domains.

INTRODUCTION

Stress can be defined as a psychological shift that can positively and negatively affect the student's achievement.[1,2] Studies have revealed that, more than 50% of all phases of undergraduate medical students are experiencing different levels of stress due to various types of stressors.[3-5] Nowadays, it is very essential to acknowledge, understand and cope up with the stress prevailing among medical students as it affects their academic performance, well-being, and future careers as healthcare providers. Medical education requires one of the lengthiest training periods and students with a strong personality, the mind strength to do hard work and acceptance to learn and gain communication and professional skills so that they can succeed in their career. But certain times the training pathway in medical education has caused inadvertent consequences on the physical and mental health of students.

MATERIALS AND METHODS

Following ethical approval from the Institutional Ethical Committee of Kanyakumari Govt Medical College, informed voluntary consent was obtained from participants via Google Forms. Participants included MBBS students from the 2020 (final year), 2021 (III year), 2022 (II year), and 2023 (I year) cohorts of Kanyakumari Govt Medical College who consented to participate; students who were absent or unwilling were excluded. The study, conducted over one year, utilized a validated 40-question questionnaire administered via Google Forms. Participant ages ranged from 17 to 24 years. The validated questionnaire contained 6 domains which

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includes Academic related stressors (ARS), Intrapersonal and interpersonal related stressors (IRS), Teaching and learning-related stressors (TLRS), Social related stressors (SRS), Drive and desire related stressors (DRS), Group activities related stressors (GARS). Domain I, II, III, IV, V, VI containing 13, 7, 7, 6, 3, 4 questions respectively. Students marked their responses to each of the 40 questions on a Likert scale ranging from -causing no stress at all (0) to causing severe stress (4). A mean score of 0 to 1.00 -cause mild stress , 1.01 to 2.00 cause moderate stress, 2.01 to 3.00 - cause high stress, 3.01 to 4.00 - cause severe stress.

The data were compiled and organized using Microsoft Excel. Statistical analysis was performed using SPSS version 22.0. The Shapiro-Wilk test was used to assess the normality of data distribution. Since the data were not normally distributed, non-parametric tests were used for further analysis. To compare differences in stress levels across different student groups, Chi-square tests were used. For further evaluation of specific stressor domains, Kruskal-Wallis test was applied. Post hoc comparisons between different years were conducted using Dunn's Test.
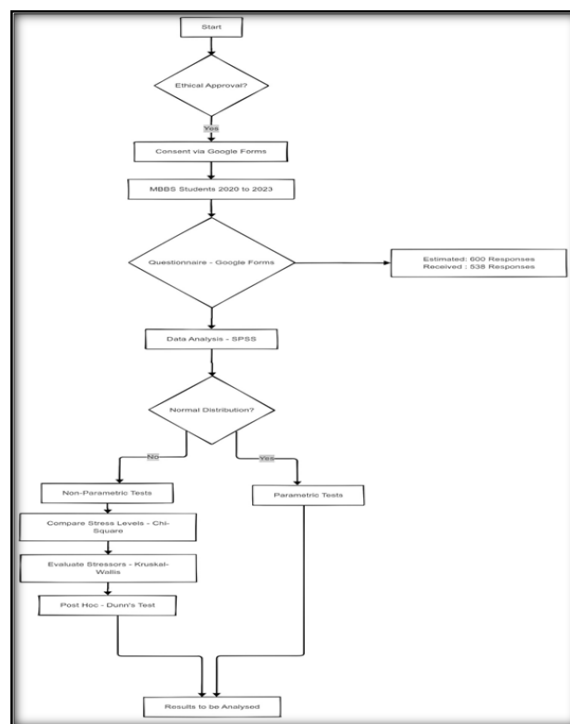

Figure 1: Process Flowchart

RESULTS

Table 1: Contingency Table – To examine the association between stressor domains and year of study.

Stressor Domain	Year of Study	Mild	Moderate	High	Severe	Total
Academic Related Stressors (ARS)	1st Year	11	42	79	17	149
	2nd Year	7	45	77	18	147
	3rd Year	10	44	74	14	142
	4th Year	5	23	57	15	100
Intrapersonal and Interpersonal Related Stressors (IRS)	1st Year	63	44	34	8	149
	2nd Year	65	42	34	6	147
	3rd Year	55	59	22	6	142
	4th Year	38	40	18	4	100
Teaching and Learning Related Stressors (TLRS)	1st Year	45	61	34	9	149
	2nd Year	34	66	40	7	147
	3rd Year	35	70	32	5	142
	4th Year	28	45	23	4	100
Social Related Stressors (SRS)	1st Year	36	65	36	12	149
	2nd Year	27	76	37	7	147
	3rd Year	32	71	30	9	142
	4th Year	24	40	32	4	100
Drive and Desire Related Stressors (DRS)	1st Year	71	60	10	8	149
	2nd Year	60	55	23	9	147
	3rd Year	59	57	20	6	142
	4th Year	40	22	28	10	100
Group Activity Related Stressors (GARS)	1st Year	47	60	37	5	149
	2nd Year	37	51	45	14	147
	3rd Year	34	63	38	7	142
	4th Year	20	24	39	7	100

This table displays the distribution of students across different stress levels (mild, moderate, high, and severe) for each domain. This allowed for a visual representation of how stress levels varied across different years.

Table 2: Descriptive Statistics

Structure	Total Scores
Valid	538
Missing	0
Mean	10.386
Standard Deviation	4.122
Shapiro-Wilk	0.991

P-Value of Shapiro-Wilk	0.002*
Minimum Score	0.000
Maximum Score	24.000

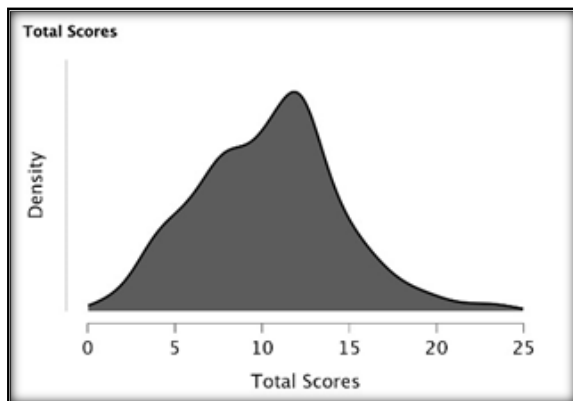*Significant P value of <0.05 is noted

Figure 2: Density Plot

Since the P- value of Shapiro -Wilk Test is <0.05 and is significant, the values obtained are not normally distributed. Hence non-parametric tests were used for further analysis. Descriptive statistics are presented as percentages of the total study population. To compare differences in stress levels across different student groups, chi-square tests were used. For further evaluation of specific stressor domains, Kruskal-Wallis test was applied. Post hoc comparisons between different years were conducted using Dunn's test

Following this, a Chi-square test of independence was conducted to determine if there was a statistically significant association between the year of study and stress levels for each domain. Among all domains, only the Drive & Desire Stressor (DRS) domain showed a significant association ($\chi^2 = 29.700$, df = 9, $p < 0.001$), indicating that stress levels in this domain varied significantly across different years.

Table 3: KRUSKAL – WALLIS H TEST

Factor	Statistic	Degree of Freedom	P value
Year of Study	10.223	3	0.017*

*Significant P value of <0.05 is Noted

A Kruskal-Wallis H test was conducted to determine whether there were significant differences in total stress scores among the four academic years. The test revealed a statistically significant difference (H(3) = 10.223, p = 0.017), indicating that stress levels varied across the years of study.

Table 4: Dunn's post hoc test

Comparison	Z score	Wi *	Wj †	rrb ‡	p
1st Year – 2nd Year	-1.723	241.218	272.187	0.117	0.085
1st Year – 3rd Year	-1.679	241.218	271.658	0.123	0.093
1st Year – 4th Year	-3.173	241.218	304.625	0.219	0.002
2nd Year – 3rd Year	0.029	272.187	271.658	0.003	0.977
2nd Year - 4th Year	-1.619	272.187	304.625	0.124	0.105
3rd Year – 4th Year	-1.634	271.658	304.625	0.136	0.102

Wi *– Rank sum or weight of the first group,

Wj † - Rank sum or weight of the second group, rrb ‡- Rank biserial Correlation

To identify which groups differed, Dunn's post hoc test was performed. A significant difference was observed between 1st-year and 4th-year students (p = 0.009), A negative z-value in Dunn's test means that the first group (1st-year) has a higher rank (higher stress) compared to the second group (4th-year). Since Kruskal-Wallis and Dunn's test rank values from lowest to highest, a negative z-score indicates that 1st-year students have higher stress scores than 4th-year students. No other pairwise comparisons reached statistical significance.

DISCUSSION

Medical school teaches a good medical curriculum with skills to the students. They are also challenged psychologically and emotionally by encountering various stressors throughout their academic journey.[4,5]

A nonspecific response or reaction by the body to the demands made on it or to the disturbing events in the environment can be defined as stress 1. It's the process how the individual perceives and cope up with the environmental threats and the challenges. It's not a stimulus or response. Stressors are the events that cause stress. Academic stressors include vastness of academic curriculum, fear of failure or poor performance in exams, lack of recreation, loneliness along with higher age group and year of studying MBBS.[7]

Despite facing challenges adapting to the educational structure, medical students experience significant academic pressure and a need to achieve high grades. This demand often leads them to sacrifice their social, emotional, and physical health, potentially hindering their capacity to learn and succeed academically. Few studies also indicates that the tertiary education environment is generally considered to be highly demanding for students.[4,5]

Chronic exposure to stressful conditions exerts negative effects on emotional, mental and physical well-being of students. Numerous studies have revealed that persistent stressful conditions were

associated with mental and physical health problems in medical students at various stages of their training.[4,5]

Excessive stress was also linked with depression, where 29.56% of medical students were found to be having suicidal risk at some point of time in their life as stated from a South Indian study.[8] This may in turn make them feel inadequate and they could not have satisfaction in their life.[5,9]

General Trends in Stress Domains: The findings revealed that five out of the six stress domains- academic-related stress (ARS), interpersonal and relationship stress (IRS), teaching and learning- related stress (TLRS), social-related stress (SRS), and group activities and social expectations stress (GARS)-did not exhibit significant differences between academic years. This indicates that medical students face a relatively stable burden of stress in these areas throughout their training.

Academic-Related Stressors (ARS): Stress related to academic performance, examinations, and syllabus burden was found to be consistently high across all years. The demanding nature of medical education ensures that academic pressure remains a constant challenge for students at all stages. In this study, final-year students exhibited the highest stress levels, with 72% experiencing high or severe stress. In contrast, third-year students had the lower proportion of students in these categories, with 61.9% reporting high or severe stress.

Interpersonal and Relationship Stressors (IRS): Stress stemming from relationships with peers, faculty, and family remained consistent, suggesting that difficulties in communication, competition, and expectations are uniformly experienced. First-year students again showed the highest stress levels, with 46% experiencing high or severe stress, while fourth- year students reported the lowest stress levels in this category, with only 4% experiencing severe stress.

Teaching and Learning-Related Stressors (TLRS): Concerns regarding faculty teaching styles, clinical exposure, and understanding of concepts were similar across all years, implying that these challenges persist regardless of the stage of medical education. Third-year students had the highest proportion of students experiencing high stress (22.5%), while fourth-year students reported the lowest levels of severe stress, with only 3% of students falling into this category.

Social-Related Stressors (SRS): Social stressors, such as peer competition and lack of personal time, showed no significant variation, highlighting that the competitive and time-intensive nature of medical school affects students equally. In this study, it followed a similar trend, with first-year students reporting the highest proportion of students in the high and severe stress categories (32.2%), whereas fourth-year students had the lowest severe stress levels (4%).

Group Activities and Social Expectations Stressors (GARS): Stress related to extracurricular obligations and societal expectations did not show significant changes, suggesting that students experience similar external pressures across all academic years. Third-year students experienced the highest levels of stress, with 31.7% experiencing high or severe stress, whereas fourth-year students again had the lowest stress levels, with only 14% in the high or severe stress category.

Although a higher percentage of final-year students report severe stress in some domains, statistical analysis shows that first-year students have a significantly higher.

This study aimed to compare the prevalence of stress among medical students across different academic years. The findings revealed a significant difference in Drive and Desire-Related Stress (DRS) between first-year and final-year students, with first-year students reporting higher stress levels. This suggests that the transition to medical school is a particularly stressful period for students. Previous studies conducted revealed first year students were more stressed in other domains such as IRS, TLRS but not DRS.[10-17]

Several factors may contribute to the higher DRS stress among first-year students. Firstly, the transition from school to medical college is a significant life event that can be challenging for many students. They may experience a sense of loss of control, uncertainty about their future, and difficulty adjusting to a new academic and social environment. Secondly, first- year students may lack clarity regarding their career goals, leading to uncertainty about their professional future. Finally, they may feel pressured to prove themselves in a new academic and social environment, leading to self-doubt and anxiety.

In contrast, final-year students showed significantly lower levels of DRS stress. This may be because they have gained confidence in their academic and clinical abilities over time, developed better coping mechanisms and resilience, and have a clearer sense of career direction and professional aspirations. Published research reveals a divergence in results, as some studies demonstrate final year students have greater stress compared to those in their first year.[18-20]

The higher stress levels among first-year students may have several negative consequences. Stress can lead to burnout, which is a state of emotional, physical, and mental exhaustion caused by prolonged or repeated stress. Burnout can lead to decreased academic performance, absenteeism, and even dropping out of medical school. Stress can also lead to mental health problems, such as anxiety and depression.

CONCLUSION

This study investigated stress levels among medical students across different academic years. The findings indicated that stress is a consistent factor in medical education, but it is notably higher in first- year students, particularly concerning 'Drive and

Desire-Related Stress' (DRS). This increased stress in new students may arise from adapting to medical school, uncertainties about their future careers, and the demanding academic setting.

Conversely, Final-year students reported less overall stress, suggesting medical training improves coping skills, academic confidence, and career clarity. While academic stress remained consistently significant across all years, other inherent stressors of medical education showed less variation.

These findings underscore the significance of providing targeted support, especially to incoming medical students, to bolster their stress management skills. Medical institutions should contemplate implementing formalized mentorship programs, incorporating effective feedback systems for these mentorships, and ensuring necessary revisions to current mentorship structures are carried out. Workshops focused on stress reduction and readily accessible mental health resources are vital to ease the adjustment to medical school. Fostering a supportive learning climate and prioritizing student well-being through structured mentorship initiatives can also contribute to lessening the enduring consequences of academic and psychological pressures.

Addressing stress at every phase of medical education is paramount, both for student well-being and for cultivating robust and proficient future healthcare providers. Further longitudinal research, tracking students across their educational journey, could offer a more nuanced understanding of how stress patterns evolve and the sustained effectiveness of various stress mitigation approaches.

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