Student's Journal of Health Research Africa
Vol. 4 No. 12 (2023): December 2023 Issue
https://doi.org/10.51168/sjhrafrica.v4i12.876
Original article

A CROSS-SECTIONAL STUDY OF STRESS AMONG UNDERGRADUATE MEDICAL STUDENTS IN A TERTIARY CARE TEACHING INSTITUTE, JHARKHAND.

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Abstract:

Background

Medical students are more exposed to stressful situations due to their academic pressure, difficult learning environment, and challenging competency-based medical education design that does not provide enough time for their personal life events. So, chronic stress among medical students results in depression, substance abuse, and even suicide. This study aims to determine the prevalence of stress among undergraduate medical students of RIMS, Ranchi, Jharkhand, India.

Methodology

This was a cross-sectional study conducted among 258 undergraduate medical students of RIMS, Ranchi from January 2022 to December 2022. Perceived Stress Scale-10 was used to evaluate the degree of stress among undergraduate medical students. Data obtained was analyzed using MS Excel and SSS based on SPSS and Minitab (2018).

Results

A total of 258 undergraduate medical students participated in the study of which 41.4% were male and 58.52% were female. Although a moderate stress rate of 68.9% was registered in most participants, 22.48% were affected by high stress. Participants in the 4th professional MBBS are more likely to experience high stress (45.06%) as compared to students in the 2nd professional MBBS, 1st professional MBBS, and 3rd professional MBBS respectively. The difference in stress severity was statistically significant at $p < 0.05$.

Conclusion

Most undergraduate medical students (68.99%) have moderate stress. Female (29.8%) are more likely to have high stress. The final professional MBBS students (44.06%) have more high stress.

Recommendation

Counseling services to medical college students are strongly recommended to address the stress.

Keywords: *Stress, Undergraduate-Medical Students, Cross-Sectional Study, Prevalence.*
Submitted: 2023-12-01 Accepted: 2023-12-02

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Introduction:

It is a fact that everyone experiences some degree of stress in their life. WHO defined stress as a state of worry or mental tension caused by a difficult situation. Stress is a natural response to humans, which triggers them to deal with problems but also causes threats in their lives. Stress is the wear and tear on the mind that we experience as humans and can adapt to the changing environment. Stress has physical as well as emotional effects that have the potential to influence us either positively or negatively. Stress results in some positive physiological changes to cope with it. Whereas, as a negative influence, it can result in feelings of fear, distress, uselessness, guilt, rejection, anger, and depression, which in turn can lead to various health problems2. Medical education is generally considered as being stressful in all its complexity and diversity. Because it deals with human lives which makes one more conscious and leads to stressful situations. After

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completing the rigorous competition, medical students are admitted to the medical college, which has already put a strain on their lives. Although, stress in medical students has been dealt with through various coping mechanisms, but still, it is a global problem. Chronic stress can interrupt personal life, leading to fatigue, a lack of concentration, and irritability.

Several studies have concluded that medical students are more exposed to stress as compared to other university students due to the overburdened academic pressure, long duration of study, and challenging learning environment that provides almost negligible time for their personal life events4. So, they try to get through these stressful situations by adopting smoking habits, alcohol, unhealthy diets, and reduced physical activity5 which eventually leads to an increase in the heart rate, and blood pressure6 as well as becoming prone to various chronic diseases7. All these factors lead to not only deterioration in academic performance8,9, a decline in clinical skills, medical errors, and a lack of empathy toward their patients but also responsible for psychological stress10,11 as well as development of anxiety12 and depression and even lead to suicide13 among various stressed medical students. It is therefore essential to be cognizant of the signs and symptoms of psychological stress experienced by medical students, particularly those that are strongly linked to depression, to assist in the early identification and treatment of these issues14. This is why the purpose of this study was to identify the amount of stress that medical students experience, not only in terms of their health but also in terms of their academic performance at different stages of their studies.

Objective of the study:

To determine the prevalence of stress among undergraduate medical students of RIMS, Ranchi, Jharkhand, India.

Materials and methods:

An observational study was conducted among 258 undergraduate medical students of RIMS, Ranchi from January 2022 to December 2022.

Study Design:

Cross-sectional study

Study settings

Rajendra Institute of Medical Sciences, Ranchi, Jharkhand, India

Ethical consideration

Ethical Approval no. - R40/22 from the Institutional Ethics Committee (IEC), Rajendra Institute of Medical Sciences, Ranchi, Jharkhand was taken before the study.

Sampling & data collection procedure:

Since in this study, the population was known and definite, we have applied Slovin's formula for calculating the sample size as follows:

Sample size = N / (1+Ne 2) Where, N = Total study population, e = Margin of error

So, considering a study population of 720 with a confidence level of 95%, power of the study of 80%, and margin of error of 5%; a sample of 258 undergraduate medical students were selected. we included 1st prof, 2nd prof, 3rd prof, and final year MBBS students of RIMS, Ranchi, who were present at the school. Exclusion criteria were medical students who were not available in their respective classes during two visits. For the data collection procedure, first of all, a list of all the registered undergraduate medical students from the academic session 2018-19 to 2021-22 was taken from their corresponding attendance register after obtaining permission from the concerned authorities. A sample of 258 undergraduate medical students were selected after a simple randomization technique.

The informed consent from all the study participants was taken appropriately. Then each and all participants were explained about the nature of the study and preformed questionnaires in proper format were distributed among the study participants. While there are various scales used to measure stress in the population, such as the Standard Stress Scale, Effort-Reward imbalance scale, and the Kessler psychological distress scale, we have chosen to use the Perceived Stress Scale15, which consists of 10 questions, ranking from 0-4 for each item, with answers ranging from Never, Rarely, Sometimes Quite Often, and Very Often depending on whether they occurred within one month before the survey was conducted. Because it measures the extent to which participants perceive their lives as stressful in the past month. PSS-10 scores were obtained by reversing the scores on four positive items 4, 5, 7, and 8 (for example 0 = 4, 1 = 3, 2 = 2, 3=1, 4=0) and then adding across all 10 items to get a total score. The scale with higher scores indicates greater stress levels and lower scores indicate lower stress levels. The Perceived Stress Scale-10 (PSS-10) has a possible score range from 0 to 40 with scores ranging from 0-13 considered as low stress; 14-26 as moderate stress and scores ranging from 27-40 considered as high perceived stress. Once the study participants were explained and comfortable with the questionnaire, the Perceived Stress Scale was distributed among them to rank the best options listed below the questions.

Bias

Recall bias and selection bias were going to possibly arise.

Observations and Results

A total of 258 undergraduate medical students of RIMS, Ranchi, Jharkhand, India were evaluated to determine the prevalence of stress among them. The filled preformed questionnaires based on the Perceived Stress Scale were analyzed, evaluated, and finally expressed in the percentage using Microsoft Excel (Microsoft Corporation, Redmond, Washington, United States). The chi-square statistic has been applied to show the association of stress levels among genders as well as with academic year among undergraduate medical students.

The prevalence of stress is seen in **Figure 1** for all participants, with 68.9% of them showing moderate stress. While 22.48% and 8.52%, respectively, had high and low levels of stress

Figure 1: Showing Prevalence of stress level among under-graduate medical students:

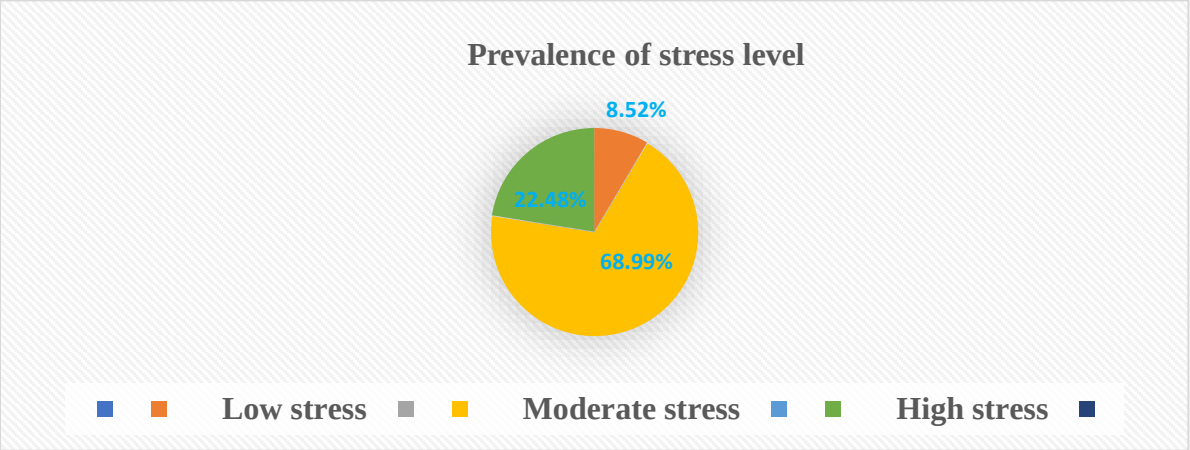


Table 1: Showing association of stress level with gender among under-graduate medical students:

Gender	Low stress	Moderate stress	High stress	Total
Male	16 (9.12) [5.18]	78 (73.82) [0.24]	13 (24.05) [5.08]	107
Female	6 (12.88) [3.67]	100 (104.18) [0.17]	45 (33.95) [3.60]	151
Total	22	178	58	258

The chi-square statistic is 17.9376. The result is significant at p <0 .05 $X^2(1, 258) = 17.9376$, $p < 0.05$

Figure 2: Showing Prevalence of stress level among gender of under-graduate medical students:

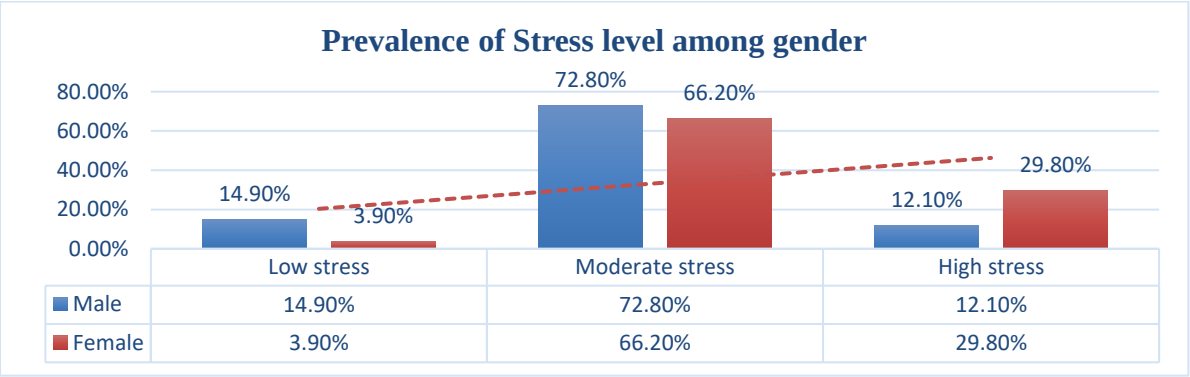
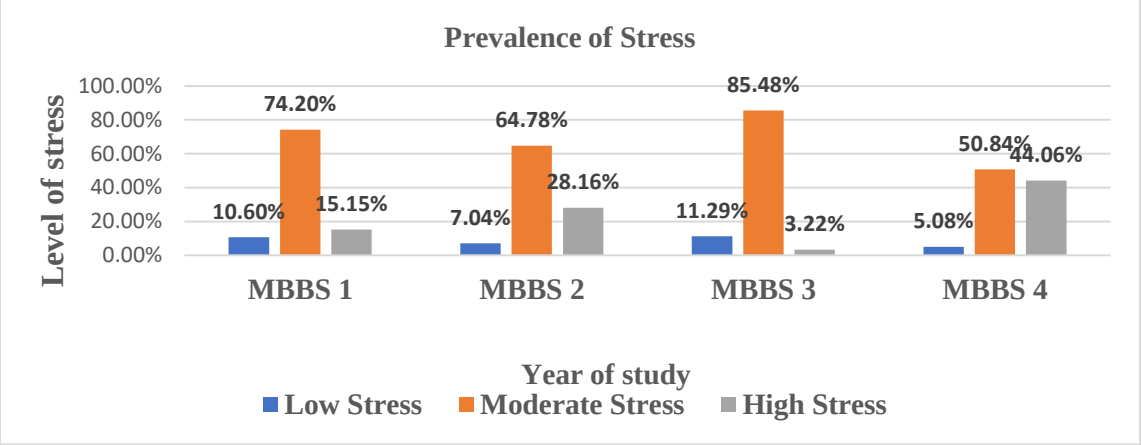


Table 2: Showing association of stress level with academic year among under-graduate medical students:

Academic Year	Low Stress	Moderate Stress	High Stress	Total
MBBS 1	7 (5.63) [0.33]	49 (45.53) [0.26]	10 (14.84) [1.58]	66
MBBS 2	5 (6.05) [0.18]	46 (48.98) [0.18]	20 (15.96) [1.02]	71
MBBS 3	7 (5.29) [0.56]	53 (42.78) [2.44]	2 (13.94) [10.22]	62
MBBS 4	3 (5.03) [0.82]	30 (40.71) [2.82]	26 (13.26) [12.23]	59
Total	22	178	58	258

The chi-square statistic is 32.6525. The result is significant at $p < 0.05$ $X^2(1, 258) = 32.6525$, $p < 0.05$.

Figure 3: Showing Prevalence of stress level among Academic year of study of under-graduate medical students:



The prevalence of high stress was more in female undergraduate medical students (29.8%) than in male undergraduate medical students (12.1%), which was shown to be statistically significant (p< 0.05), as shown in table 1 and figure 2. Contrarily, male undergraduate medical students reported moderate stress levels at 72.8% against female students at 66.20%. In terms of low stress levels, only 3.9% of female experienced them, compared to 14.9% of male.

It has been clear from figure 3 that 74.2% of 1st professional MBBS students were affected by moderate stress.

Whereas, 4th professional MBBS students were affected more by high stress (44.06%) as compared to 2nd year (28.16%), 1st year (15.15%) and 3rd year (3.22%) MBBS students respectively, which was found to be statistically significant (*p<0.05)* as shown from table 2.

Discussion:

Due to the lack of such a study in Jharkhand, India, this survey was performed and it has been clear from **figure1** that the majority of undergraduate medical students (68.99%) are affected by moderate stress. In contrast, 22.48% of them continued to be under high stress, and only 8.52% under low stress. These results were found to be similar to a study conducted on undergraduate medical students from the Kingdom of Saudi Arabia in 201717, which revealed the prevalence of stress to be 82%. It has been depicted from Table 1 and Figure 2 that the prevalence of high stress was more in females (29.8%) as compared to the male undergraduate medical students (12.1%) which was found to be statistically significant (*p<0.05)*. A similar study was performed by Dahlin et al18, Ahmadi et al19, and Somnath T. Salgar20 in which they found that females are more stressed than males. This might be because females are supposed to be more emotional, passionate, and enthusiastic, and tend to be more obliged towards their studies, which leads them to spend more time in study as compared to their male peers. This would put their social and group activities at risk and make them feel even more stressed. Furthermore, females can express signs of stress, even smaller ones more easily. It is clear from Figure 3 that 74.2% of 1st professional MBBS students were affected by moderate stress.

This could be due to a change of environment and a lack of parental supervision for the first time, which can lead to homesickness as well as involvement with the hectic schedule of the new CBME-based curriculum. The prevalence of high stress among 2nd professional MBBS students is 28.16% which is more than 1st professional (15.15%) and 3rd professional MBBS students (3.22%). This could be due to an overburden of clinical and para-clinical subjects in comparison to only pre-clinical subjects in the first year and only clinical subjects in the 3rd professional MBBS. In addition, the requirement to

follow the syllabus as per the CBME guideline in the second professional MBBS within the 12-month time frame also increased the pressure on them. Figure 3 demonstrates that 4th professional MBBS students are affected more by high stress (44.06%) as compared to 2nd year (28.16%), 1st year (15.15%), and 3rd year (3.22%) MBBS students respectively, which was found to be statistically significant ($p<0.05$). This could be due to the lengthy syllabus of clinical subjects, the busy schedule of clinical posting, studying for a long time as a result of the competitive academic environment, and feeling pressured by peers to get high marks in the final MBBS exam. In addition, the strong goal of getting a desired branch in the post-graduate entrance examination soon after completing an internship compels them to study more and rigors that can be challenging and stressful. Similar results were found in a study conducted by Dr. A. N. Supe21 and Dr. Rahul Surve at Aurangabad22.

Generalizability

External validity of the study can be further increased by increasing more number of medical students and also by removing bias.

Source of funding

Self-funded

Conclusion

The results of the study indicate that the stress score was higher among female undergraduate medical students as compared to male students, with the stress score being higher in the 4th professional MBBS students. This can have a significant effect on the students' personal lives, as well as their academic performance and, potentially, their mental health.

Limitation of the study

The association of relevant stress factors i.e., academic, skill and learning-related, desire-related, social-related, etc were not taken into consideration in this study. The study was limited to undergraduate medical students only. So, admitting the fact that the majority of healthcare professionals experience stress, a study should be conducted to evaluate the stress levels of all healthcare professionals.

Recommendations

It is necessary to provide counseling services to medical college students to address this issue. Further research should be conducted to explore various methods of analyzing the extensive medical curriculum and to alleviate academic stress, such as by adding additional extracurricular activities such as sports, arts, and crafts.

Acknowledgment

All authors would like to express profound appreciation to the study participants for their cooperation and kind support.

Conflicts of interest

There are no conflicts of interest.

List of abbreviations

CBME- Competence Based Medical Education
MBBS- Bachelor of Medicine and Bachelor of Surgery
WHO- World Health Organization

References

1. Behere SP, Yadav R, Behere PB. A comparative study of stress among students of medicine, engineering, and nursing. Indian J Psychol Med 2011; 33(2):145–148.
2. Dyrbye LM, Thomas MR, Shanafelt TD. Medical student stress: causes, consequences, and proposed solutions. Mayo Clin Proc 2005; 80(12):1613–1622.
3. Jain A, Bansal R. Stress among medical and dental students: a global issue. IOSR J Dent Med Sci (JDMS) 2012; 1(5):5–7.
4. Liu C, Xie B, Chou C-P, Koprowski C, Zhou D, Palmer P, et al. Perceived stress, depression, and food consumption frequency in the faculty students of China seven cities. Physiol Behav. 2007; 92: 748–54.
5. Mikolajczyk RT, Ansari W, Maxwell AE. Food consumption frequency and perceived stress and depressive symptoms among students in three European countries. Nutr J. 2009; 8: 31.
6. Dyrbye LN, Thomas MR, Shanafelt TD. Systematic review of depression, anxiety, and other indicators of psychological distress among U.S. and Canadian medical students. Acad Med. 2006;81(4):354–73.
7. Wolf TM. Stress, coping and health: enhancing well-being during medical school. Med Educ. 1994;28(1):8–17 discussion 55-17.
8. Singh A, Lal A, Shekhar S. Prevalence of depression among medical students of a private medical college in India. Online J Health Allied Sci 2010; 9(4):1–3.
9. Elias H, Ping WS, Abdullah MC. Stress and academic achievement among undergraduate students in Universiti Putra Malaysia. Proc Soc Behav Sci 2011; 29:646–655.
10. Sherina MS, Rampal L, Kaneson N. Psychological Stress Among Undergraduate Medical Students. Med J Malaysia. 2004; Vol 59:207-211.
11. Marjani , Gharavi , Jahanshahi , Vahidirad , Alizadeh . Stress among medical students of Gorgan (South East of Caspian Sea), Iran.

Kathmandu University Medical Journal. 2008; Vol. 6, No. 3, Issue 23: 421-425.
12. Iqbal S, Gupta S & Rao EV. stress, anxiety & depression among medical undergraduate students & their socio-demographic correlates. Indian J Med Res 141, March 2015; 354-357.
13. Rtbey G, Shumet S, Birhan B, Salelew E. Prevalence of mental distress and associated factors among medical students of University of Gondar, Northwest Ethiopia: a cross-sectional study. BMC Psychiatry. 2022;22(1):523.
14. Kenneth R. Pelletier, Daniel Goleman, Joel Gurin, Eds. *Between Mind and Body: Stress, Emotions, and Health in Mind Body Medicine*, Consumer Reports Books, Consumer Union: Yonkers, New York, 1993, 19-38.
15. Cohen S, Kamarck T, Mermelstein R: A global measure of perceived stress. J Health Soc Behav 1983, 24:385-96
16. Melaku L, Mossie A, Negash A. Stress among medical students and its association with substance use and academic performance. J Biomed Educ. 2015;2015.
17. Mahyuddin RA, Haneef ZM, Alalwani BM, Al Juhani A, Fallatah SM, Abdulmajeid SA, Alsaidi DA. The Prevalence of Stress among Medical Students and Its Effects on Academic Performance in The Kingdom of Saudi Arabia. Egypt J Hosp Med 2018 Apr 1;71(5):3200-5.
18. Dahlin M, Joneborg N & Runeson B. Stress and depression among medical students: a cross-sectional study.Blackwell Publishing Ltd Medical Education 2005;39:594–604.
19. Ahmadi J, Pridmore S, Fallahzadeh M. Neurotic scores in sample of medical students. German J psychiatry. 2004;7:51-5.
20. Somnath T. Salgar. Stress in first year medical students. IJBAR 2014;05(01).
21. Supe AN. A study of stress in medical students at Seth G.S. Medical College. J Postgraduate Med. 1998; 44:1-6.
22. Surve R, Dase R, et al. Assessment of stress level among medical students of MGM Medical college and Hospital Aurangabad (MS): International Journal of current medical and Applied sciences. 2015; 5:156-160

Publisher Details

Publishing Journal: Student's Journal of Health Research Africa.
Email: studentsjournal2020@gmail.com or admin@sjhresearchafrica.org

(ISSN: 2709-9997)

Publisher: SJC Publisher Company Ltd
Category: Non-Government & Non-profit Organisation
Contact: +256775434261(WhatsApp)
Email: admin@sjpublisher.org
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