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Original Research Article

A Hospital Based Study to Assess Stress Prevalence, Primary Stressor, Major Coping Technique, and Stress and Academic Performance in Undergraduate Medical Students

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Abstract

Aim: The aim of the present study was to estimate the prevalence of stress, main stressor, major coping strategy adopted and the relation between stress and academic performance was studied among the undergraduate medical students.

Methods: This cross-sectional study was conducted under the department of physiology with a convenience sample of 100 first-year undergraduate medical students in Nalanda Medical College, Patna, Bihar, India.

Results: Mean PSS score was 18.52 ± 6.14 in male students, 21.18 ± 5.28in female students and 19.16 ± 5.35 in all the students. Mean PSS score was highly significantly more in female students when compared to male students with a p-value of 0.005. The main source of the stressor was academic-related, followed by social-related stressors, teaching and learning related stressors, group activities related stressors, Intra and interpersonal related stressors, drive and desire related stressors in the decreasing order. The majority of the students were using active coping, acceptance, planning, positive reframing and using instrumental support to cope stress. Substance abuse was the least coping strategy employed. In the mild group, not significant negative correlation was seen in between PSS vs. theory and practical marks. A positive, not significant correlation was observed between PSS vs. Viva-voce marks in mild group. Although the negative correlation was observed in between PSS vs. theory, practical and viva-voce marks in moderate and severe stress groups, highly significant negative correlation was observed only in moderate stress group as $p < 0.005$.

Conclusion: Our study revealed a higher prevalence of stress among females. Academic related stressors were major stressors. Majority of students were employing positive coping strategies. A negative correlation was observed between stress and academic performance in theory marks. So, regular counselling to decrease stress might improve the academic performance of the students.

Keywords: Academic performance, coping strategy, stress, stressor, undergraduate medical students

Introduction

Stress is an unavoidable experience resulting from the complex interactions between an individual and his or her environment. Stress occurs when an individual's resources are insufficient to cope with situational demands and pressures. Stress is a subjective experience that is more likely to arise in some situations than others. In addition, some individuals can be more prone to stress than others. Overall, stress can undermine the achievement of goals, both for individuals and organisations. [1] Depression, anxiety, and stress have been seen to lead to outcomes such as impaired functioning, burnout, and other health problems that can adversely affect individuals and society at large. [2] Stress has been linked to all leading physical causes of death—heart disease, cancer, and stroke. [3] Excessive stress has also been reported to result in physical and mental health problems and reduced self-esteem, as well as affect academic achievement and personal and professional development. [4] It predicts negative health behaviours such as smoking, alcohol abuse, illicit substance use, and sleeplessness, as well as relapses. [5-7]

Medical training has long been globally recognised as involving numerous stressors that can affect the well-being of students. [4] The prevalence of stress

ranges from 21% to 94.5% across different phases (first year to final year) of medical training. [8-10] These high prevalence rates among medical students show that stress poses a huge public health problem. The level of stress among medical students has been reported to depend on the medical curriculum, examination system, and the administration of the medical school. [11] Stress can influence medical students' academic performance by decreasing attention span and affecting decision-making. [11] A study reported that psychological stress in the initial years of medical education could predict occupational stress in later years. [12]

Coping strategies are defined as frequently changing cognitive and behavioral efforts by an individual to control specific external or internal demands perceived to be taxing or exceeding the resources of the individual. [13] Active coping strategies include behavioral and psychological responses to changing circumstances or the stressor itself and include planning, instrumental support, venting, positive reframing, humor, and acceptability. [14] Avoidant coping strategies lead people into activities (such as drug use) or mental states (such as withdrawal) that keep them from directly addressing stressful events. [14,15]

The aim of the present study was to estimate the prevalence of stress, main stressor, the major coping strategy adopted and the relation between stress and academic performance was studied among the first-year undergraduate medical students.

Materials and Methods

This cross-sectional study was conducted under the department of physiology with a convenience sample of 100 first-year undergraduate medical students in Nalanda Medical College, Patna, Bihar, India.

Inclusion Criteria:

All healthy undergraduate medical students.

Exclusion Criteria:

Students on anti-depressant medication were excluded from the study.
Institutional Ethical committee clearance was taken before the commencement of the study and written informed consent of students was taken. Each subject was put on a series of tests using a pre-tested, pre-structured study questionnaire. Stress was assessed by perceived stress scale one week before the exam. The PSS-10 taps into the student's life as a whole more than the past 1 month and does not just pertain only to academics. The PSS-10 had demonstrated good internal (intra-observer) reliability with Cronbach's alphas ranging from 0.78 to 0.91 and test–retest reliability coefficients ranging from 0.55 to 0.85. [16] PSS Questionnaire contains 10 questions. The respondent was given a score for each question on a Likert scale. The PSS scores were computed by reversing responses (i.e., 0= 4, 1= 3, 2 = 2, 3 =1 and 4= 0) to the four positively stated items of 4, 5, 7 and 8.

The scores were finally summated and according to assessment score students were divided into 3 groups' mild (0-13), moderate (14-26) and severe stress (27-40) groups. Academic performance was assessed by theory, practical and viva-voce. Sources of stress were assessed by Medical Student Stressor Questionnaire [17] which consists of 6 domains assessed by 40 item questionnaire. Mean of 6 domains will be calculated and the degree of that stressor affecting students was assessed accordingly. Coping up strategies was assessed by Brief COPE questionnaire [18] which consists of 28 items grouped into 14 domains. The responses anticipated from participants were based on their kind of reaction to different stressful circumstances in the learning environment tabulated on a four-point Likert-type scale. Response choices ranged from ''1. I have not been doing this at all'' to 4: ''I've been doing this a lot.'' The students made their choices according to the coping tactic most frequently used to manage the stressful events experienced by them. Mean of 14 domains was calculated. The data obtained was analysed with statistical package for social sciences software (SPSS-10). Data was expressed as mean ±SD. Statistical results were considered significant at $p<0.05$ and highly significant at $p<0.005$. The relation between stress level and academic performance was assessed by Pearson correlation coefficient. Major stressor and main stress coping strategy in first-year undergraduate medical student were assessed.

Results

Table 1: Prevalence of stress among first-year medical students with PSS 10

	Male N=40	Female N=60	Total
Mild stress	8	7	15
Moderate stress	30	45	75
Severe stress	2	8	10
Mean PSS score	18.52 ± 6.14	21.18 ± 5.28	19.16 ± 5.35

Mean PSS score was 18.52 ± 6.14 in male students, 21.18 ± 5.28in female students and 19.16 ± 5.35 in all the students. Mean PSS score was highly significantly more in female students when compared to male students with a p-value of 0.005.

Table 2: Source of stressors assessed by Medical student stressor questionnaire

Domains	Mean ± SD
Academic related stressors	1.95 ± 0.065
Intra and interpersonal related stressors	1.14 ± 0.076
Teaching and learning-related stressors	1.28 ± 0.075
Social related stressors	1.36 ± 0.058
Drive and desire related stressors	0.68 ± 0.062
Group activities related to stressors	1.26 ± 0.064

The main source of the stressor was academic-related, followed by social-related stressors, teaching and learning related stressors, group activities related stressors, Intra and interpersonal related stressors, drive and desire related stressors in the decreasing order.

Table 3: Stress coping strategies assessed by the Brief COPE questionnaire

Domains	Mean ± SD
Active coping	5.38 ± 0.122
Planning	5.18 ± 0.144
Positive reframing	5.04 ± 0.142
Acceptance	5.28 ± 0.144
Humour	3.96 ± 0.144
Religion	4.26 ± 0.146
Using emotional support	4.85 ± 0.149
Using instrumental support	5.03 ± 0.157
Self-distraction	4.76 ± 0.144
Denial	4.32 ± 0.492
Venting	4.24 ± 0.126
Substance use	2.74 ± 0.114
Behavioural disengagement	4.16 ± 0.124

The majority of the students were using active coping, acceptance, planning, positive reframing and using instrumental support to cope stress. Substance abuse was the least coping strategy employed.

Table 4: Pearson correlation calculated between PSS vs. theory, practical and viva-voce marks

Stress Groups		PSS vs. Theory	PSS vs. Practical	PSS vs. Viva-voce
Mild	r value	-0.218	-0.344	0.216
P value		0.398	0.19	0.42
Moderate	r value	-0.298	-0.126	-0.114
P value		0.0017	0.208	0.256
Severe	r value	-0.37	-0.212	-0.116
P value		0.239	0.52	0.724

In the mild group, not significant negative correlation was seen in between PSS vs. theory and practical marks. A positive, not significant correlation was observed between PSS vs. Viva-voce marks in mild group. Although the negative correlation was observed in between PSS vs. theory, practical and viva-voce marks in moderate and severe stress groups, highly significant negative correlation was observed only in moderate stress group as $p< 0.005$.

Discussion

Stress is defined as “a physical or psychological stimulus that can produce mental or physiological reactions that may lead to illness”. [19] The term ‘stress’ was first employed in the 1930s by the endocrinologist -Hans Selye. [20] Stress is caused by an existing stress-causing factor or "stressor." A stressor can be viewed as a double- edged weapon that may stimulate and motivate the students to peak performance or reduce the students to ineffectiveness. [21] To meet this stress, students are using coping strategies. Coping strategies are behavioural or psychological efforts employed to master or minimize stressful events, affect the medical residents variably. Studies have revealed that active coping strategies such as positive reframing, acceptance, and planning affect the mental health outcome favourably whereas avoidant strategies such as denial, drug, or alcohol use worsen the situation. [22] The stressed condition can lead to many psychological responses such as anxiety,

hopelessness, irritability, depression, or a general feeling of being unable to cope with life. But beyond some point, "stress" becomes "distress." The act which may lead to distress varies significantly from person to person. [23] In the first- year undergraduate medical students, the prevalence of mild stress is 14.8%, moderate stress is 68.4% and severe stress is 16.8%. [24]

Mean PSS score was 18.52 ± 6.14 in male students, 21.18 ± 5.28in female students and 19.16 ± 5.35 in all the students. Mean PSS score was highly significantly more in female students when compared to male students with a p-value of 0.005. In contrast, studies done by Anandalakshmi et al [25] and Sunni and Latiff [26] found out that males have not significantly higher PSS scores when compared to females. The main source of the stressor was academic-related, followed by social-related stressors, teaching and learning related stressors, group activities related stressors, Intra and interpersonal related stressors, drive and desire related stressors in the decreasing order. The majority of the students were using active coping, acceptance, planning, positive reframing and using instrumental support to cope stress. Substance abuse was the least coping strategy employed. In the mild group, not significant negative correlation was seen in between PSS vs. theory and practical marks. Academic related stressors and drive and desire related stressors were the major and minor stressors stated by students in the current study similar to Bhavani et al. [27] Studies done by Kakoli Ghaushal et al [28], Chowdary et al [29] and Panchu et al [30] showed academic-related stressors were leading contributors of stress in undergraduate medical students. The requirement of in-depth knowledge of the vast medical syllabus, less time to study different subjects and lack of awareness to prepare answers by their own are leading to make academic stressors as a major stressor.

A positive, not significant correlation was observed between PSS vs. Viva-voce marks in mild group. Although the negative correlation was observed in between PSS vs. theory, practical and viva-voce marks in moderate and severe stress groups, highly significant negative correlation was observed only in moderate stress group as $p< 0.005$. As the studies were conducted in the western world, substance abuse was the main coping strategies in those studies. In the current study, the relation between stress and theory academic performance was a negative correlation in all the three stress groups. However, the negative relation only in moderate stress group was significant. A negative non-significant correlation was seen between stress and practical mark in all stress groups. A non-significant negative correlation was observed between stress and viva marks in moderate and severe stress groups whereas a non-significant positive correlation was observed in mild stress group. A study done by Shakir et al [31] showed a negative significant correlation between stress and academic performance. A non-significant negative correlation was observed by Shah et al. [32]

Conclusion

Our study revealed a higher prevalence of stress among females. Academic related stressors were major stressors. Majority of students were employing positive coping strategies. A negative correlation was observed between stress and academic performance in theory marks. So, regular counselling to decrease stress might improve the academic performance of the students.

References

1. Michie S. Causes and management of stress at work. Occup Environ Med. 2002;59(1):67–72.
2. Hj Ramli N., Alavi M., Mehrinezhad S., Ahmadi A. Academic stress and self-regulation among university students in Malaysia: mediator role of mindfulness. Behav Sci. 2018; 8(1):12.
3. Cohen S., Janicki-Deverts D., Miller G.E. Psychological stress and disease. Jama. 2007; 298(14):1685–1687.
4. Oku A.O., Owoaje E.T., Oku O.O., Ikpeme B.M. Prevalence of stress, stressors and coping strategies among medical students in a Nigerian medical school. African J Med Health Sci. 2015;14(1):29.
5. Kassel J.D., Stroud L.R., Paronis C.A. Smoking, stress, and negative affect: correlation, causation, and context across stages of smoking. Psychol Bull. 2003;129 (2):270.
6. Herman J.P. Neural pathways of stress integration: relevance to alcohol abuse. Alcohol Res Curr Rev. 2012;34(4):441–447.
7. Ellis J.G., Gehrman P., Espie C.A., Riemann D., Perlis M.L. Acute insomnia: current conceptualizations and future directions. Sleep Med Rev. 2012;16(1):5–14.
8. Dyrbye L.N., Shanafelt T.D. Commentary: medical student distress: a call to action. Acad Med. 2011;86(7):801–803.
9. Yusoff M.S., Rahim A.F., Baba A.A., Ismail S.B., Pa M.N. Prevalence and associated factors of stress, anxiety and depression among prospective medical students. Asian J Psy. 20 13;6(2):128–133.
10. Amr M., El Gilany A.H., El-Hawary A. Does gender predict medical students' stress in Mansoura, Egypt? Med Educ Online. 2008;13 (1):4481.
11. Soliman M. Perception of stress and coping strategies by medical students at king Saud university, Riyadh, Saudi Arabia. J Taibah Uni Med Sci. 2014;9(1):30–35.

12. Rada R.E., Johnson-Leong C. Stress, burnout, anxiety and depression among dentists. J Am Dent Assoc (Ed Espñola) 2004;135(6):788–79 4.
13. Redhwan AA, Sami AR, Karim A, Chan R, Zaleha M. Stress and coping strategies among Management and Science University students: A qualitative study. IIUM Medical Journal Malaysia. 2009 Dec 1;8(2).
14. Al-Dubai SA, Al-Naggar RA, Alshagga MA, Rampal KG. Stress and coping strategies of students in a medical faculty in Malaysia. The Malaysian journal of medical sciences: MJMS. 2011 Jul;18(3):57.
15. Holahan CJ, Moos RH. Risk, resistance, and psychological distress: a longitudinal analysis with adults and children. Journal of abnormal psychology. 1987 Feb;96(1):3.
16. Cohen S, Kamarck T, Mermelstein R. A global measure of perceived stress. Journal of health and social behavior. 1983 Dec 1:385-96.
17. Habeeb KA. Prevalence of stressors among female medical students Taibah University. Journal of Taibah University Medical Sciences. 2010 Jan 1;5(2):110-9.
18. Carver CS. You want to measure coping but your protocol'too long: Consider the brief cope. International journal of behavioral medicine. 1997 Mar;4(1):92-100.
19. Pruessner JC, Gaab J, Hellhammer DH, Lintz D, Schommer N, Kirschbaum C. Increasing correlations between personality traits and cortisol stress responses obtained by data aggregation. Psychoneuroendocrinology. 1997 Nov 1;22(8):615-25.
20. Hans Selye (1956): "The stresses of life, New York", Mc Graw Hill; 523-567.
21. Glanz K, Rimer B, Viswanath K (2008): Health Behavior and Health Education: Theory, Research and Practice (4thedn.), San Francisco, Jossey Bass; 210-236.
22. Sreeramareddy CT, Shankar PR, Binu VS, Mukhopadhyay C, Ray B, Menezes RG. Psychological morbidity, sources of stress and coping strategies among undergraduate medical students of Nepal. BMC Medical education. 2007 Dec;7(1):1-8.
23. Guruprakash KV, Mehta SG, Atul B, Prakash J, Divinakumar KJ, Khan SA, Patra P. A study of relationship between perceived stress, coping pattern, burnout, and general psychopathology among the postgraduate medical students. Industrial psychiatry journal. 2018 Jan;27(1):141.
24. Thangaraj S, D'souza L. Prevalence of Stress Levels Among First Year Medical Undergraduate Students.
25. Anandhalakshmi Swaminathan AS, Sahityan Viswanathan SV, Thilipkumar Gnanadurai TG, Saravanan Ayyavoo SA, Thirunavukarasu Manickam TM. Perceived stress and sources of stress among first-year medical undergraduate students in a private medical college-Tamil Nadu.
26. Al Sunni A, Latif R. Perceived stress among medical students in preclinical years: A Saudi Arabian perspective. Saudi Journal for Health Sciences. 2014 Sep 1;3(3):155-9.
27. Bhavani Nivetha M, Ahmed M, Prashantha B. Perceived stress and source of stress among undergraduate medical students of Government Medical College, Mysore. International Journal of Community Medicine and Public Health. 2018 Aug;5(8):3513.
28. Ghosal K, Behera A. Study on prevalence of stress in medical students. J Res Med Dent Sci. 2018 Jan 1;6(5):182-6.
29. Chowdhury R, Mukherjee A, Mitra K, Naskar S, Karmakar PR, Lahiri SK. Perceived psychological stress among undergraduate medical students: Role of academic factors. Indian J Public Health. 2017 Jan 1;61(1):55-7.
30. Panchu P, Bahuleyan B, Vijayan V. An analysis of the factors leading to stress in Indian medical students. Int J Clin Exp Physiol. 2017 Jan 1;4(11):48-50.
31. Hafeez S, Khan AU, Saeed BB, Javed Y. Relationship among Perceived Stress, Academic Performance and use of Energy Drinks: A Study on Universities' and Medical Students of Khyber Pakhtunkhwa Province of Pakistan. International Review of Management and Marketing. 2016 Jan 5;6(3):494-9.
32. Shah M, Hasan S, Malik S, Sreeramareddy CT. Perceived stress, sources and severity of stress among medical undergraduates in a Pakistani medical school. BMC medical education. 2010 Dec;10:1-8.