Original Research Article

A study on perceived stress, stressors, coping strategies and relationship between stress and academic performance among first-year undergraduate medical students

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Abstract

Background: Medical profession involves a lot of stress during the course and also while practising. Failure to deal with the stress will throw them into a vicious cycle of negativism in their personal and professional life. **Aims and Objectives:** This study was intended 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. **Methodology:** Perceived stress, stressors and coping strategies were studied by Perceived Stress Scale 10, Medical Student Stressor Questionnaire and Brief COPE questionnaire respectively one week before the examination. Academic performance of theory, practicals and viva was taken based on internal assessment marks. The relation between stress and academic performance was assessed by Pearson correlation coefficient. **Results:** Significant difference in mean PSS score was observed between females (20.197±5.26) and males (17.566±5.14). Significant negative correlation was observed in moderate stress group (r = -0.299, p = 0.0019). **Conclusion:** Stress influences academic performance in a negative manner. So, it should not be ignored among the medical students. Proper counselling helps the students for their improvement.

Key Words: Academic performance, coping strategy, stress, stressor, undergraduate medical students.

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INTRODUCTION

Medical profession though noble yet gives a lot of stress. A thin line of judgement difference especially in emergencies leads to either death or survival of the patients. So this field requires high academic brilliance. Especially first year in the under graduation is the phase involving the highest stress. Because they are exposed to new medical terminologies, adjustments to the logical and concept-oriented medical curriculum, peers, hostel. They have to face financial burdens, time management problems and meet family expectations. They need to attain knowledge at the molecular level, attitude with empathy, proficiency in skills in all the three vast basic subjects of the first-year medical under graduation in a short course of time. So to cope up with these expectations they will have to work hard landing in modern age disease, Stress.

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Stress is defined as “a physical or psychological stimulus that can produce mental or physiological reactions that may lead to illness”.[1] The term ‘stress’ was first employed in the 1930s by the endocrinologist -Hans Selye.[2] 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.[3] 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.[4] 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.[5] 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% [6]. By understanding the influence of stress on the academic performance we can try to reduce the stressors and introduce beneficial coping strategies in the changing curriculum for the well being and betterment of medical students. So in this study, we aimed to assess the influence of stress on academic performance, the prevalence of stress among first-year medical undergraduate students and to segregate the potential stressors and evaluate main coping strategies adopted by students. In this study we are evaluating the relationship between stress and theory marks, practical marks and viva marks separately. Only very few studies are there in the past to evaluate such kind of relations. The objectives of the study are:

- To estimate the prevalence of stress and to observe the PSS score difference between male and female students
- To study the correlation between stress and academic performance.
- To identify the major stressor and main coping strategies adopted by first-year undergraduate medical students.

METHODOLOGY

This cross-sectional study was conducted under the department of physiology with a convenience sample of 150 first-year undergraduate medical students in a private medical college of coastal Andhra Pradesh. **Inclusion criteria:** All healthy first-year 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[7]. 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 [8] 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 [9] 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

Out of 150 students, there were 16 incompletely filled questionnaires. So results were analysed for 134 students only.

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

	Male	Female	Total
	Number of students n = 53 (Percentage)	Number of students n = 81 (Percentage)	Number of students n = 134(Percentage)
Mild Stress	9 (17%)	8 (10%)	17 (13%)
Moderate Stress	42 (79%)	63 (78%)	105 (78%)
Severe Stress	2 (4%)	10 (12%)	12 (9%)

Mean PSS score was 17.57 ± 5.14 in male students, 20.19 ± 5.26 in female students and 19.16 ± 5.37 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	1.94 ± 0.064
Intra and interpersonal related stressors	1.12 ± 0.075
Teaching and learning-related stressors	1.29 ± 0.077
Social related stressors	1.38 ± 0.059
Drive and desire related stressors	0.66 ± 0.061
Group activities related to stressors	1.25 ± 0.069

Table 2 depicts 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	5.39 ± 0.127
Planning	5.17 ± 0.142
Positive reframing	5.03 ± 0.141
Acceptance	5.27 ± 0.142
Humour	3.94 ± 0.147
Religion	4.25 ± 0.147
Using emotional support	4.82 ± 0.148
Using instrumental support	5.02 ± 0.154
Self-distraction	4.78 ± 0.148
Denial	4.31 ± 0.491
Venting	4.23 ± 0.129
Substance use	2.72 ± 0.113
Behavioural disengagement	4.17 ± 0.128
Self-blame	4.27 ± 0.164

Table 3 depicts 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	-0.219	-0.342	0.217
	P value	0.399	0.18	0.41
Moderate	r value	-0.299	-0.125	-0.112
	P value	0.0019**	0.204	0.255
Severe	r value	-0.36	-0.211	-0.115
	P value	0.238	0.51	0.722

Table 4 depicts 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

In our study, PSS score in females (20.19 ± 5.26) was significantly higher than males (17.57 ± 5.14) similar to Guruprakash *et al* and Sethia *et al* [5, 10]. In contrast, studies done by Anandalakshmi *et al* and Sunni and Latiff [11, 12] found out that males have not significantly higher PSS scores when compared to females. 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* [13]. Studies done by Kakoli Ghaushal *et al*, Chowdary *et al* and Panchu *et al* [14, 15, 16] 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. In the current study, more students were using positive coping strategies (Active coping, acceptance, planning, positive reframing) and only a few students are using avoidant coping strategies (substance abuse, venting, self-blame) similar to Guruprakash *et al*, Rohan Kalra *et al*, Yusoff [5, 17, 18].In contrast, studies done by Guthrie *et al* and Ashton *et al* [19, 20] showed students were using substance abuse as their main coping strategy. 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* [21] showed a negative significant correlation between stress and academic performance. A non-significant negative correlation was observed by Shah *et al* [22]. The study conducted by Adlard *et al* observed a positive correlation between stress and academic performance [23].In the study conducted by Mukhesh *et al* [24], stress showed beneficial effects in females and negative relation in males. The varying effects of stress on performance is often compared to or known as “inverted-u” which has an impact on the cognitive areas of learning as well neuroplasticity [25].

LIMITATIONS OF THE STUDY

The influence of stress on academic performance varies with different disciplines. For instance, the relationship between stress and academic performance was significant among students in Agriculture and Veterinary Sciences, Humanities and Social Sciences only but not others [26]. So, there is a need to study confounding variables also in this study. Further, the study was done only in one medical college. If we include more colleges we can come across many factors. Further, this study was done as a cross-sectional study in convenience sampling. The impact of the study can be increased by following random sampling and prospective design.

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.

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