



A cross-sectional comparative study of coping distress in medical and non-medical students

Abstract

Background: Medical students undergo tremendous stress during their undergraduate course, maybe because of staying in the hostel, economic reasons, important course, the vast amount of information and skills that need to be acquired, expectations of family members, and competition. **Objective:** To study stress, alcohol use, ways of coping stress, and perceived social support in medical students in comparison with non-medical (engineering) students. **Materials and methods:** A cross-sectional study was conducted in a medical and an engineering colleges at Kuppam, Andhra Pradesh, India from November 2012 to August 2013. One hundred and fifty medical and 150 engineering students were selected after randomised sampling and were administered Perceived Stress Scale, Alcohol Use Disorders Identification Test, Multidimensional Perceived Social Support Scale, and Ways of Coping Questionnaire to assess psychological distress. **Results:** Medical students (72%) perceived more stress (moderate and high) compared to engineering students (56.7%), ($p < 0.05$). The most frequently used coping strategy among medical students compared to engineering students was playful problem solving and accepting responsibility, while in engineering students it was seeking social support. Medical students compared to engineering students perceived higher social support from significant other, while it was family in engineering students. All students fell into the category of low risk of alcohol use. **Conclusion:** The medical students perceived more stress than engineering students. Both should be sensitised about ways of coping distress; if unable to manage them, advised to seek help from professionals. So that they can cope distress well that which can have positive influence on studies, examination results, and lifestyle.

Keywords: Stress. Social Support. Alcohol.

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INTRODUCTION

Stress among medical students may be due to the new surroundings, hard challenging studies, new friends, teachers, and also the teen tender age.[1] One must also consider so many emotionally exhausting realities of life they come across such as pain, fear, sexuality concerned issues, and witnessing the death of patients in the hospital; thus, adding a further dimension to the existing demands.[2]

Psychological distress among students also reduces their self-esteem, quality of life, and the quality of care they provide to patients with decreased empathy. They may engage in potentially harmful methods of coping with stress, such as tobacco, alcohol, and other substance abuse.[3,4] Alcohol consumption will lead to many negative health effects and an array of harmful social consequences, impaired environmental relations, family relations, and negative impact on their academic performance.[5]

Previous studies have showed that coping plays a central role in adaptation to stressful life events.[6] Coping strategies are classified into active and avoidant coping strategies.[7]

Active coping is considered a better way to deal with stress, while avoidant coping is considered as a psychological risk factor for adverse responses to stressful life events.

Social support reduces psychological distress and promotes adjustments that counteract high stress levels and many negative effects of stress, e.g. poor academic performance and sleep disturbance. A study shows an association between social support and academic performance,[8] another study shows that the students use emotional support as an important strategy to face stressful situations.[9]

Medical students represent a highly learned group of people under significant pressure. They encounter multiple emotions during their medical course. Thus, there is a growing concern about psychological distress in medical training. There are very few studies assessing stress among medical students in India. Comparisons of medical students with other university student populations are also rare. A study by Naveen *et al.*[10] shows 32.9% of medical students and 34.2% of the engineering students from professional colleges in the urban area suffered from stress. Another similar study by Waghachavare *et al.*[11] determines that the proportion of

stress in medical and engineering students from professional colleges in urban area was 25.1% and 19.7% respectively.

Hence, we wanted to evaluate medical students' stress, alcohol use, coping strategies, and social support against another student population (engineering students) from professional colleges in rural area, as both the group of students started studying in their undergraduate course in both the institutes in their early age facing challenges like the new environment and hard challenging studies.

Aims and objectives

To study perceived stress, ways of coping, social support, and alcohol use in medical students in comparison with non-medical (engineering) students.

MATERIALS AND METHODS

It is was a cross-sectional comparative study conducted at the Peoples Education Society Institute of Medical Science and Research (PESIMSR), Kuppam, Andhra Pradesh, India and Kuppam Engineering College (KEC) during the period of November 2012 to August 2013. A departmental review board of the two institutes approved the study. After obtaining permission from the Heads and ethics committee of both the institutions, students were approached to collect data by a trained psychiatrist and psychiatric resident to administer the tool.

Sample size and its calculation

According to an analytical observational study done by Nandi *et al.*[12] at the Institute of Post Graduate Medical Education and Research, Kolkata, India, the prevalence of stress among medical students was 43.35%. Considering this, our sample size was calculated. Hence, $Z=95\%$ confidence interval=1.96. The prevalence was taken $p=43.35$. The allowable error (d) is taken eight per cent.

The sample size was calculated with the formula

$$N = \frac{Z^2 p(1-p)}{(d)^2}$$

$$= \frac{(1.96)^2 \times 0.43 \times 0.57}{(0.08)^2} = 147.8$$

So, the desired total sample was 150 medical students. The medical students were selected after simple randomised sampling on the basis of roll numbers from the total students of the first, second, and third year respectively, from PESIMSR. A similar number of engineering students were selected in similar fashion from first, second, and third year respectively from KEC. The objectives of the study were explained to the students before initiating the study. Informed consent was taken from all the students at the time of data collection and they were assured that confidentiality and anonymity would be maintained. Participants of both the group participants were matched by the number of undergraduate professional college students, age, and almost equal gender distribution of the students.

Inclusion criteria

Students who gave written informed consent to participate in the study.

Exclusion criteria

Students who refused to participate in the study.

Students absent on the day of study and could not be contacted during a revisit.

Tools for assessment

Semi-structured proforma

This section includes socio-demographic details and specific information regarding details about school performance, choice of course, study, habits, and family details.

Perceived Stress Scale (PSS-10)

Developed by Sheldon Cohen and his colleagues to evaluate the phase in one's life assessed as stressful situations,[13] the PSS-10 was published in 1983 and has become one of the most commonly used psychological scales to evaluate nonspecific perceived stress. Roberti *et al.*[14] found that this scale is valid and reliable among college students to evaluate perceived stress.

It shows good internal consistency reliability with Cronbach's alpha ranging from 0.78 to 0.91 and test-retest reliability coefficients ranging from 0.55 to 0.85.[13] The same scale has been used in many previous studies assessing stress among college students in Indian population.[15,16] It is a ten-item scale with score ranges from zero to 40. The answers are graded on a five-point Likert scale. The score is arbitrarily divided as low perceived stress (zero to 13), moderate perceived stress (14-26), and high perceived stress (27-40).

Ways of Coping Questionnaire (WCQ)

Designed by Lazarus and Folkman to evaluate coping processes used in a specific stressful situation (not coping traits), it is a 66-item, four-point Likert-type instrument that assesses cognitive and behavioural coping strategies with eight subscales.[17] It shows good internal consistency reliability with Cronbach's alpha ranging from 0.83 to 0.86 and test-retest reliability coefficients ranging from 0.40 to 0.54.[18] This questionnaire has been used for college students to know their coping strategies in Indian population.[19,20]

Multidimensional Scale of Perceived Social Support (MSPSS)

It comprised of 12 items rated on a five-point Likert scale.[21] A higher score signifies increased levels of perceived social support. The score on individual items on MSPSS was summed and divided by 12. Scores on the four items that comprise each subscale were also summed and divided by four. MSPSS assessed satisfaction with social support from family (FA), friends (FR), and significant others (SO). It has is proven to be psychometrically sound instrument, displayed good internal consistency reliability with Cronbach's alpha equal to 0.89 and test-retest reliability equal to 0.77,[22] and used in several studies in the Asian population.[22-24]

Alcohol Use Disorders Identification Test (AUDIT)

It was designed by the World Health Organization. It consists of ten questions to ascertain whether alcohol consumption of a person may be harmful. The test was prepared to be used internationally; questions included in the instrument showed reliability across a wide range of cultural settings. There is a strong evidence of good internal consistency reliability with Cronbach's alpha equal to 0.94, item-total (less item) correlations ranged from 0.45 to 0.88.[25] AUDIT totally consists of ten items; one factor consists of items one to three and second factor consists of items four to ten. It has been successfully applied to developing country settings,[26] such as India.[27] A score of less than eight shows a low risk of alcohol consumption, a score of eight or more shows an intense likelihood of harmful or hazardous alcohol use, and a score of 20 or more indicates possible alcohol dependence.

Statistical analysis

The data were examined using the Statistical Package for Social Sciences (SPSS), Version 11. Frequency and percentages were calculated for all quantitative measures. Mean and the standard deviation were calculated for qualitative measures. The chi-squared test was used for categorical variables and Fisher's exact test if the expected frequency was less than five in more than 20% of the cells. The student t-test was used to analyse continuous variables. p-value of <0.05 is considered as statistically significant.

RESULTS

The mean age of both medical and engineering students was about 20 years and almost equal gender distribution among both medical and engineering students (Table 1).

Among medical students, 72% perceived stress (moderate and high) which was higher than engineering students (56.7%). The result was statistically significant ($p=0.013$) (Table 2).

Statistically significant coping strategies that are commonly used by medical students compared to engineering students were planful problem solving, accepting responsibility, and less used was escape-avoidance. But among engineering students, commonly used coping strategies that were statistically significant compared to medical students were seeking social support and distancing was least (Table 3).

Both medical and engineering students perceived the highest support from their friends followed by significant other and the least perceived support was from their family. Compared to engineering students (4.18), medical students (4.5) perceived higher social support from significant other and the result was statistically significant ($p<0.001$). Engineering students (4.09) perceived higher social support from family compared to medical students (3.85) and the difference was statistically significant ($p=0.034$) (Table 4).

All students fell into the category of low risk of alcohol use. None of the medical or engineering students fell in the category for a hazardous or harmful level of alcohol use (Table 5).

Table 1: Age and gender distribution of medical and engineering students

Age	Medical students (n=150)	Engineering students (n=150)
Mean (years)	20.93	20.37
Standard deviation	1.391	1.138
Gender	Frequency (%)	Frequency (%)
Male	79 (52.7)	77 (51.3)
Female	71 (47.3)	73 (48.7)

Table 2: Comparison of perceived stress among medical and engineering students using Perceived Stress Scale (PSS-10)

Perceived stress level	Count (%)		p
	Medical students (n=150)	Engineering students (n=150)	
Low perceived stress	42 (28.0)	65 (43.3)	0.013
Moderate perceived stress	77 (51.3)	66 (44.0)	
High perceived stress	31 (20.7)	19 (12.7)	

Chi-square=8.67 (df=2)

Table 3: Comparison of ways of coping among medical and engineering students using Ways of Coping Questionnaire (WCQ)

Coping strategy	Mean score \pm SD		p
	Medical students (n=150)	Engineering students (n=150)	
Confrontive coping	0.11 \pm 0.05	0.11 \pm 0.04	1.00
Distancing	0.08 \pm 0.04	0.10 \pm 0.05	0.002
Self-controlling	0.13 \pm 0.05	0.13 \pm 0.05	1.00
Seeking social support	0.10 \pm 0.04	0.14 \pm 0.06	<0.001
Accepting responsibility	0.14 \pm 0.05	0.12 \pm 0.05	<0.001
Escape-avoidance	0.12 \pm 0.04	0.10 \pm 0.04	<0.001
Planful problem solving	0.16 \pm 0.06	0.13 \pm 0.05	<0.001
Positive reappraisal	0.15 \pm 0.06	0.15 \pm 0.06	1.00

The student t-test was used to analyse continuous variables

Table 4: Comparison of perceived social support among medical and engineering students using Multidimensional Scale of Perceived Social Support (MSPSS)

Perceived social support	Mean score \pm SD		p
	Medical students (n=150)	Engineering students (n=150)	
Significant other (SO)	4.50 \pm 0.89	4.18 \pm 0.68	<0.001
Family (FA)	3.85 \pm 1.08	4.09 \pm 0.87	0.034
Friend (FR)	4.94 \pm 1.34	5.25 \pm 1.78	0.089
Total support (TS)	4.43 \pm 0.77	4.50 \pm 0.68	0.40

DISCUSSION

A cross-sectional study was conducted to analyse stress, alcohol use, ways of coping, and perceived social support

Table 5: Comparison of alcohol use among medical and engineering students using Alcohol Use Disorders Identification Test (AUDIT)

Alcohol use	Count (%)	
	Medical students (n=150)	Engineering students (n=150)
Low risk	150 (100)	150 (100)
Hazardous oharmful use	0	0
Possible dependence	0	0

in medical students in comparison with non-medical (engineering) students. The study analysed data from 300 students (150 medical and 150 engineering students).

The mean age of the 150 medical students in the present study was 20.93 years which was comparable with the mean age of the 150 engineering students, i.e. 20.37 years. Males and females were almost equally distributed among medical and engineering students.

Perceived stress

In small amounts, stress is normal and can help us to be more active and productive. However, very high levels of stress experienced over a prolonged period can cause significant mental and physical problems.

The overall prevalence of perceived stress (moderate and high) among medical students in the present study was 72%, similar to the findings of Supe (73%) done at Seth G.S. Medical College, Mumbai, India.[19] But, higher compared to findings of Saipanish (61.4%),[28] Sherina *et al.* (41.9%),[29] and Tyseen *et al.* (31.2%).[30] Studies by Solanky *et al.* (96.8%),[31] Shaikh *et al.* (90%),[32] and Chauhan *et al.* (87%)[33] had reported that students perceived stress which is higher than present results.

This could be either due to different stress tools being applied and also an environment of the medical students. But the stress levels were high in most of the similar studies regardless of the tool used. Stress has intense effects on the future of each student. It could result in harmful consequences on the career of the students.

The findings in our study that medical students were more frequent victims of perceived stress (72%) than engineering students (56.7%), was expected considering the more intensive study demands of a medical programme compared to engineering students. In pursuit of higher professional education in a highly competitive environment such as that found in medical academia, the students are more vulnerable to stress than those with lesser challenges. Our results are consistent with several studies that have reported that stress was more common among medical students.[34,35]

Ways of coping

Coping refers to the behavioural and psychological efforts that people apply to overcome, reduce, tolerate or minimise stressful events.

This study found that among medical students, the most frequently used coping strategy was planful problem solving. It means that the medical students use efforts to cope stress that were more problem-focused and analytical. Other frequently used coping strategies were positive reappraisal and accepting responsibility. The least frequently used coping strategies were seeking social support and distancing.

Whereas among engineering students, the most frequently used coping strategy was positive reappraisal which has a religious dimension to it and involves giving positive meaning to situations. Seeking social support like friends, family members, and significant other from whom they can get help, and self-controlling were the other frequently used coping strategies. The least frequently used coping strategies were distancing and escape-avoidance.

Commonly used coping strategies by medical students that were statistically significant compared to engineering students were planful problem solving, accepting responsibility and less used was escape-avoidance. But among engineering students, commonly used coping strategies that were statistically significant compared to medical students were seeking social support and distancing was least. Both medical and engineering students frequently use active coping strategies (planful problem solving, positive reappraisal, accepting responsibility, and seeking social support) rather than avoidant strategies (distancing and escape-avoidance).

A couple of previous studies by Sreeramareddy *et al.*[9] and Al-Dubai *et al.*[36] showed similar findings to our study. Surprisingly, there have been few published studies in India documenting hard and quantifiable data on the coping behaviours of medical students in different academic years of medical education.

Social support

Theoretically, perceived levels of interpersonal social support are considered to reflect one's ability to cope with challenges to one's mental and physical health by "buffering" the pathogenic effects of stress.[37,38] The importance of social support on health has been elaborated in many studies, which have found that its absence can lead to psychological distress.[39,40] Studies examining measures of well-being have concluded that social support is emotionally beneficial.[41]

In our study, both the medical and the engineering students perceived the highest support from their friends followed by significant other. This can be attributed to the fact that majority of students stay in a hostel with their friends and thus have a better association with them.

Both medical and engineering students perceived least support scores from family. This finding could be attributed to our cultural views. That it is obligatory "duty" for a family to provide support, which is not perceived as "special" and therefore does not provide satisfaction. In some other developed countries where the government provides most social support, it may be perceived as extraordinary.

Medical students compared to engineering students perceived higher social support from significant other, which were was statistically significant. As medical students

perceived more stress than engineering students, they perceive more social support from significant other (people whom the individual values most). These findings were similar to the study done by Supe.[19]

Engineering students compared to medical students perceived higher social support from family that was statistically significant. This may be because many of the engineering students stay at home along with the family members.

Alcohol use

Though previous studies have suggested an alarming rate of alcohol use among medical students,[42,43] all the medical and engineering students fell into the category of low risk of alcohol use in our study. None of the medical or engineering students fell in the category for a hazardous or harmful level of alcohol use as per the AUDIT scale. A possible reason for this might be hesitancy among medical and engineering students to reveal their alcohol status.

Conclusion

The medical students perceived more stress (moderate and high) than engineering students. Psychoeducating students regarding the unhealthy consequence of stress, positive method to cope with stress, and future preventive interventions at the level of students, parents, teachers, and administrators will reduce the negative consequences of stress on their lifestyle choices and mental health.

Limitations

Since it is was a cross-sectional study, it is hard to assess the direction of influence and it precludes us from making causal inferences from this study findings.

Scales are self-reported rather than direct observation instruments and that may have resulted in some reporting bias.

Confounding variables such as personality disorders, the influence of family environment, society, and family expectation level, and other substance abuse were not considered.

The results of this study cannot be generalised as it was conducted on students of one medical and engineering college involving a small sample. More studies involving larger population must be done in this regard so as to benefit the students.

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