

The Comparative Study on Stress of Medical and Engineering Students by Using Kessler's k-10 Questionnaire

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Abstract

Context: Many studies in medical students show that they experience a high level of stress in Undergraduate course^(1,2,3,4,5). This high level of stress has detrimental effect on learning and cognitive functioning of students⁽⁶⁾.

Aim: To determine the level of stress in medical and engineering students using K 10 questionnaire.

Results: The response rate of students for questionnaire was 85.6%. High prevalence of stress was noted (experienced both by male and female) in medical compared with engineering students. Stress levels were higher in first year and final year among medical students. Stress level subsided as the year of study in professional course progressed.

Conclusion: Stress was found in both medical and engineering students with higher stress levels in females as compared to males. There is a pressing need to teach students to handle stress.

Keywords: Medical, Engineering, Students, Stress.

Introduction

The medical and engineering courses are very demanding and create a high level of stress in the students. This stress may lead to depressive symptoms or depression in around one third of medical students^(7,8,9). Increased level of stress has been linked to reduced empathy⁽¹⁰⁾, suicidal thoughts^(11,12) and reduced academic performance.^(13,14,15)

The level of stress in medical students exceeds the age matched general population^(16,17,18). There

is a pressing need to assess the stress levels among young learning professionals so that measures at the institutional and family levels may be arranged to take care at the earliest.

Aims and Objectives: This study was conceived to know the level of stress among medical and engineering undergraduate students.

Material and Method

Study Universe: Students of Veer Chandra Singh Garhwali Government Institute of Medical Sciences and Research and Engineering students of National Institute of Technology, Srinagar (Garhwal), Uttarakhand of all academic years.

Study Participants: All the male and female medical and engineering students.

Study Design: Cross-sectional study

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Study Instrument: Kessler developed the K-10 Psychological distress scale which has been used in many epidemiological studies. There are five responses to each question which varies from “none of the time” to “all of the time” and are scored from 1 to 5. To obtain the total score all the questions were collected. Interpretation was - a score below 20 was representing no level of stress while a score of 20-24 representing mild stress, 25-29 showed moderate stress and 30- 50 represented severe stress.

Study Procedure: All the male and female medical students of Veer Chandra Singh Garhwali Government Institute of Medical science and Research and Engineering students of National Institute of Technology, Srinagar (Garhwal), Uttarakhand in the all academic years, were invited to complete the English version of the K10 self-administered, anonymous questionnaire during the academic year 2015-2016. This study was carried for comparing 372 medical students and 346 engineering student’s year wise. The whole test was explained in detail to each subject and consent was taken from every subject before the test. The students were allowed to respond in their own free time and privacy. The participation was totally voluntary. Data was collected from the willing participant. Kessler

Psychological Distress Scale (K-10) was provided to the students of both Medical and Engineering backgrounds. The questionnaire was collected after it was completed. The K-10 Score was then calculated by adding up (Likert type Scale).

Ethical Consideration: Institutional ethical permission was obtained before commencement of the study. Those students who were found to be stressed were referred to the psychiatric counsellor for further management.

Statistical Analysis: The data was entered in Microsoft excel spreadsheet and analysis of data was done using SPSS software version 16 for Windows. To detect difference in the means of continuous variables, T-test and ANOVA test were used for 2 and more than 2 variables respectively. Post hoc analysis was done using Tukey test with a significance level of < 0.001.

Results

Out of the 400 medical students who received questionnaires 372 completed and returned them (response rate = 93%) of all respondent and out of 400 engineering students 346 completed and returned it (response rate = 86.5%).

Table 1: Comparison of scores among engineering and medical students in different years of professional course.

Year of Course	Engineering students	Medical students	P-value
	(Mean±S.D.)	(Mean±S.D.)	
1	22.03±6.156	27.62±6.009	<0.001
2	22.09±6.627	23.60±5.207	0.0877
3	23.45±5.726	26.45±2.382	<0.001
4	23.90±4.468	26.97±2.558	<0.001
Total	22.85±5.862	26.16±4.591	<0.001

Table 2: Intergroup comparison of stress level between different years of medical students.

Year	Compared Year	Mean Difference	P value	95% C.I
1 st Year	2 nd Year	-4.022	<0.001	(-5.67 to -2.38)
	3 rd Year	-2.848	<0.001	(-4.50 to -1.20)
	4 th Year	-3.366	<0.001	(-5.00 to -1.73)
2 nd Year	3 rd Year	1.173	0.48	(-0.48 to 2.83)
	4 th Year	0.655	0.98	(-0.98 to 2.29)
3 rd Year	4 th Year	-0.518	0.848	(-2.16 to 1.13)

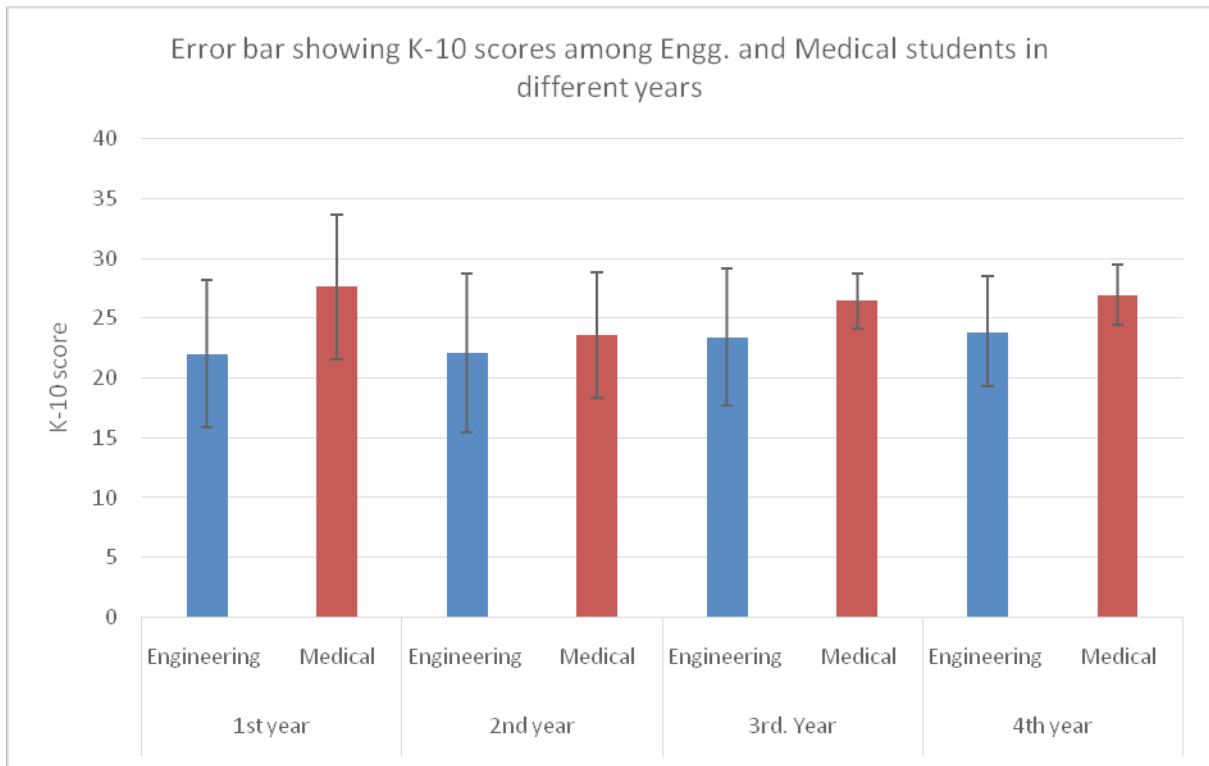


Figure 1: Graph shows year wise mean score in medical and engineering students.

Above error bar shows the scores of stress levels among engineering and medical graduate level students in various years of course. It is seen that first year and final year students show more stress in medical stream.

Table 3: Intergroup comparison of stress level between different years of engineering students.

Year	Compared Year	Mean Difference	P value	95% C.I
1 st	2 nd	0.61	1	(-2.22 to 2.34)
	3 rd	-1.353	0.409	(-3.61 to 0.90)
	4 th	-1.802	0.204	(-4.17 to 0.57)
2 nd Year	3 rd	-1.413	0.356	(-3.63 to 0.81)
	4 th	-1.863	0.169	(-4.20 to 0.47)
3 rd Year	4 th	-0.449	0.959	(-2.76 to 1.86)

The multiple comparisons of stress level between different years of engineering students, the P value difference of stress score in engineering students is statistically not significant ($P > 0.001$).

Table 4: Mean score of male and female students in engineering and medical streams

Stream	Male Students	Female Students	p-value
Engineering (M/F=321/25)	22.42±5.80	28.28±3.506	<0.001
Medical (M/F=172/200)	25.83±5.315	26.45±3.852	<0.001
Overall (M/F=493/225)	23.51±5.86	26.65±3.852	<0.001

Mean score is high in females compared to males. There is significant difference in stress level of males and females.

Discussion

This study showed a relatively high prevalence of stress experienced by both male and female medical students compared to engineering students. There was difference in prevalence or in mean scores of stress between male and female students contrary to that reported from medical students in United Kingdom⁽²⁰⁾. A considerable proportion of stressed students had stress levels that were likely to result in developing symptom and psychiatric problem which is similar to findings of other study⁽²¹⁾. Initial adaptations to the program were more stressful than other stages of training. But in the study stress was found to be significantly more in first year compared to other year levels. Living away from home and coping with a new program of study can be thought as roots of stress in the first year of program. Later in the program work related stress are more pronounced in hospital such as interaction with patient and staff.

In the present study the level of stress reduced as the year of study progressed in line with the study conducted in a medical school in Saudi Arabia⁽¹⁾ and is contradictory to the result of another study where it reached 40 percent higher by the end of clinical training⁽²²⁾. Results of other studies in North America also suggest that mental health worsens after students join a medical school and remains poor throughout the course, especially in the transition from basic science teaching to clinical training. Only one study falls in line with the finding of this study that the students found medical course stressful during the first year of study but less so in subsequent years. This finding could be explained due to interplay of varied factors. First, this is not a cohort study but a cross-sectional. This may be because of stress in different groups and not the same batch of student. One more reason could be that the students may have devised coping mechanisms. Lastly low failure rates in later years of courses make students more confident and less stressed⁽¹⁾.

The prevalence of stress in the study was higher among the female students compared to their male counterparts but other studies have shown that the gender differences in specific stress symptoms and overall prevalence or mean scores of stress were scarce and did not turn out to be a significant factor in reporting of stress.

As the study findings showed a high level of stress among the first-year students, we suggest supporting

them and taking care of this group by the student support system. This will also help them cope well with stress in the later years. It is very important to target stress-prevention strategies at students who have any level of psychological stress to prevent the development of more serious conditions relating to stress. Wellness and mental health programs are also needed to help students make smooth transition between different learning environments with changing learning demands and a growing burden on their mental and physical capacity.

There are undoubtedly numerous difficulties, unchangeable facets of medical training but efforts should be made to sort out as many factors as possible. Method suggested for reducing student stress are the use of small groups of teaching. Staff student committees that can examine for stressors. Our findings suggest that many stressors are present in the path to become a doctor. A more detailed investigation of these factor throughout universities of medicine and based on that introducing procedures centrally and university based will undoubtedly help tackle many of these problems.

A little amount of stress is necessary to add variety to one's life and for developing optimal performance at examinations. Stress in moderation is involved with growth and is necessary for sound personal functioning⁽¹⁾.

Our study shows that the stress level of medical students in 1st and 4th year is higher compared to rest of the years. The possible reason may be home sickness, the college is located in remote and hilly area, extreme weather, risky route and no source of entertainment as the place is devoid of parks, movie theatres, malls etc. The stress level in the female students is higher compared to males due to psychosocial factors.

Conclusion

From the present study we can conclude that there is an urgent need to train the students in effective stress management. Stress is a part of life which cannot be eliminated but has to be managed. The only solution which would not only help us but aide in combating stress is managing it, to our best.

Conflict of Interest: None

Source of Funding: Self

Ethical Clearance: Was taken prior to this study even though it had no animal or human iintervention

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