Original Research Article

Comparison of perceived stress among medical and engineering students of Karpaga Vinayaga Educational Group, Kancheepuram District, Tamil Nadu

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ABSTRACT

Background: Doctors and engineers are experiencing stress from their student life. There are very few studies from South India, which have looked into comparison of perceived stress among medical and engineering students. Hence, this study was attempted with an objective to estimate the overall prevalence and to compare the perceived stress, and to know associated factors influencing stress, among medical and engineering students of Karpaga Vinayaga Educational group, Kancheepuram district, Tamil Nadu.
Methods: A cross sectional study was conducted in Karpaga Vinayaga Educational Institute, Tamil Nadu, from June to September 2016. Based on simple random sampling, students from medical and engineering college were selected. After obtaining informed consent, a self administered questionnaire was administered. The data was analysed in SPSS version 18.0.
Results: Out of 560 study subjects, 135 (24.2%) had low stress, 390 (69.6%) had moderate stress and 35 (6.2%) severe stress. Stress was associated with personal problems OR=2.29 (95% CI: 1.19-4.39), sleep disturbance OR=4.12 (95% CI: 1.57–10.7), difficulty in understanding the subject OR=2.32 (95% CI: 1.19–4.53), difficulty in time management OR=2.47 (95% CI: 1.40–4.35) and home sickness (p=0.001) in medical students whereas among engineering students, stress was associated with personal problems OR=2.01 (95% CI: 1.02–3.92), sleep disturbance OR=2.14 (95% CI: 1.1–4.1) and difficulty in time management OR=2.6 (95% CI: 1.48–4.58).
Conclusions: The overall prevalence of perceived stress was 75.8%. The prevalence of perceived stress among medical students was 76.8% as compared to 75% of engineering students. Among medical and engineering students, stress was associated with personal problems, sleep disturbance and difficulty in time management.

Keywords: Stress, Medical students, Engineering students, Associated factors of stress

INTRODUCTION

Stress is a complex, dynamic process of interaction between a person and his or her life. Although it is a stimulus and response, it is a process in which we perceive and cope up with threats and challenges around us.[1]

Doctors and engineers are facing a great burden of expectations from the society. Meeting these expectations is always challenging and stressful, which they start to experience from their student life.[2] Stress in students life, may be due to various reasons such as academics, personal situations, environment, time management or economic circumstances.[3] These are referred as stressors,

which are perceived differently by each individual. A stress may be favourable or unfavourable.[4] This unfavourable stress, which is experienced by students not only affects their scholastic performance but also affects their personal well being, decision making and long term professional capabilities.[1]

According to the National Institute of Mental Health, Bangalore; nearly a quarter mental health services are required on the campus.[5] This is because excessive stress in students has lead to increase in prevalence of psychological problems.[6] It is a major public health concern as identification and treatment of these psychiatric problems among students, is a challenge.[2] However, we can try to prevent the untoward consequences of stress by evaluating students who have severe stress and counsel them.

Validated scales have been developed for evaluating stress among students.[7] The prevalence of stress in studies which used these scales has ranged from 52% to 60%.[8-10] However, there are very few studies from South India, which have looked into comparison of perceived stress among medical and engineering students. Hence, this study was attempted with an objective to estimate the overall prevalence and to compare the perceived stress, and to know the associated factors influencing stress, among Medical and Engineering students of Karpaga Vinayaga Educational group, Kancheepuram district, Tamil Nadu.

METHODS

A cross sectional study was conducted in Karpaga Vinayaga Educational Institute, Madurantakam Taluk, Kancheepuram District, Tamil Nadu, India from June 2016 to September 2016. The study population was Medical and Engineering students from Karpaga Vinayaga Educational Group.

Sample size

In a study conducted by Iqbal et al [11], 53% of the medical students were stressed. Assuming this prevalence and absolute precision of 6%, the minimum sample size required was found to be 278. So, 280 medical and 280 engineering students were included.

After obtaining the ethical clearance from Ethical Committee, Karpaga Vinayaga Institute of Medical Sciences and Research Centre, Madurantakam, necessary permissions was taken from college authorities of Karpaga Vinayaga Institute of Medical sciences and Karpaga Vinayaga College of Engineering and Technology. Complete list of student's name of all the four years from medical and engineering college was taken separately and from each year, 70 students were selected randomly using simple random sampling technique, so as to meet the sample size of 280 (4 years × 70 students) medical and 280 (4 years × 70 students)

engineering students. Equal proportion of males and females were included so as to make it a more representative sample. House surgeons were not included in our study. The purpose of the study was explained to the study subjects. After obtaining informed written consent from them, a self administered questionnaire consisting of socio demographic profile, details on personal problems, sleep disturbances, difficulty in time management, difficulty in understanding the subjects, home sickness as perceived by the student and stress assessment tool (perceived stress scale) was distributed to them. The data thus obtained was entered and analyzed using SPSS version 18.

Perceived stress scale is a self reported instrument to measure the degree to which situations in one's life are appraised as stressful. It was developed by Sheldon Cohen and his colleagues in the year 1983. It is a validated scale with reliability and Crohbach's alpha of 0.91.It consisted of 14 items and later on in year 1988, it was reduced to 10 item scale. Each item is rated on a 5-point scale ranging from never (0) to almost always (4). Positively worded items are reverse scored (items 4, 5, 7 and 8) and the ratings are summed, with higher scores indicating more perceived stress. Scores ranging from 0-13 is considered as low stress, scores from 14-26 as moderate stress and 27-40 as high stress.[12]

Statistical analysis

Quantitative variables such as age, stress scores were summarized using mean and standard deviation. Qualitative variables such as gender, place of stay etc., were summarized as percentages. The stress was categorized as mild, moderate and severe. Percentage of students was calculated in each category of stress level. Comparison of stress scores among medical and engineer students was done using student t test and comparison of stress within the various semesters of medical and engineer students was done using one way ANOVA. The associated factors of stress were evaluated by Chi-square test with 5% level of significance.

RESULTS

In our study, out of 560 study subjects, 280 of them were medical students and 280 engineering students. Further, from each year of both the course, 70 of them were included in our study (35 males and 35 females). The mean age of medical students was 19.64 years with SD±1.16 and the age ranged from 17 to 23 years. The mean age of engineering students was 18.71 years with SD±1.36 and the age ranged from 17 to 22 years. The total perceived stress scale score ranged from 0 to 40 with mean score of 17.26 and SD±6.44.

Among medical students, the mean PSS score was 17.74 (SD±6.34) as compared to engineering students with mean of 16.78 (SD±6.53) and this difference was not found to be statistically significant (p=0.07). Even in

medical students, the difference in mean stress scores of different year students (Table 1) (ANOVA) was not found to be statistically significant (p=0.25). However, when we did the post hoc test (LSD), we found that there was statistically significant difference in mean stress scores of first year and fourth year (p=0.04).

Table 1: Comparison of mean stress score of study subjects according to year of study.

Course	Year of study	Stress score Mean± SD	Total no. of participants	One way ANOVA p value
Medical	First	18.86±5.99	70	F=1.359 p=0.25
	Second	17.69 ±6.13	70	
	Third	17.71±6.26	70	
	Fourth	16.70±6.87	70	
	Total	17.74±6.34	280	
Engineering	First	13.93±6.24	70	F=9.89 p=0.001*
	Second	15.87±7.80	70	
	Third	18.19±5.54	70	
	Fourth	19.14±5.02	70	
	Total	16.78±6.53	280	
*Statistically significant				

Table 2: Distribution of study subjects by stress (according to year of study).

Course	Year of study	Low stress no (%)	Moderate stress no (%)	Severe stress no (%)	Total no. of participants	Chi-square p value
Medical	First	12 (17.1)	54 (77.1)	4 (5.7)	70	χ^2=3.519 p=0.74
	Second	18 (25.7)	47 (67.1)	5 (7.1)	70	
	Third	16 (22.9)	47 (67.1)	7 (10)	70	
	Fourth	19 (27.1)	46 (65.7)	5 (7.1)	70	
	Total	65 (23.2)	194 (69.3)	21 (7.5)	280 (100)	
Engineering	First	27 (38.6)	42 (60)	1 (1.4)	70	χ^2=20.87 p=0.002*
	Second	23 (32.9)	43 (61.4)	4 (5.7)	70	
	Third	13 (18.6)	52 (74.3)	5 (7.1)	70	
	Fourth	7 (10)	59 (84.3)	4 (5.7)	70	
	Total	70 (25)	196 (70)	14 (5)	280 (100)	
*Statistically significant						

Table 3: Comparison of stress of medical and engineering students by their year of study.

Year of study	Stress	Medical students no (%)	Engineering students no (%)	Chi square p value
First	Yes	58 (82.9)	43 (61.4)	χ^2=7.997 p= 0.005*
	No	12 (17.1)	27 (38.6)	
Second	Yes	52 (74.3)	47 (67.1)	χ^2=0.862 p=0.35
	No	18 (25.7)	23 (32.9)	
Third	Yes	54 (77.1)	57 (81.4)	χ^2=0.391 p=0.53
	No	16 (22.9)	13 (18.6)	
Fourth	Yes	51 (72.9)	63 (90)	χ^2=6.802 p=0.009*
	No	19 (27.1)	7 (10)	
*Statistically significant				

In engineering students, the difference in mean stress scores was found to be statistically significant (p=0.001) (Table 1) and post hoc test (LSD) also revealed that there was statistically significant difference in mean stress scores of first year and third vidyear (p=0.001), first year and fourth year (p=0.001), second year and third year (p=0.02) and second year and fourth year (p=0.002).

Out of 560 study subjects, 135 (24.2%) had low/no stress, 390 (69.6%) of them had moderate stress and 35 (6.2%) had severe stress according to Cohen's perceived stress scale (10 items). Among medical students, the difference in proportion of various categories of stress among different year of study, in study subjects was not found to be statistically significant (p=0.74). However, in

engineering students, it was found to be statistically significant (p=0.002) (Table 2).

In this study, for comparison we combined moderate and severe stress, as stress in one group and low/no stress as one group. We found that 58 (82.9%) of first year medical students were having stress as compared to 43 (61.4%) of engineering first year students and this difference in proportion was found to be statistically significant (p=0.005). Similarly, 51 (72.9%) of fourth year medical students were stressed as compared to 63(90%) of engineering fourth year students and this difference in proportion was found to be statistically significant (p=0.009). However, we did not find any statistically significant difference among second and third year medical and engineering students (Table 3).

Table 4: Association of stress with various variables.

Course	Variables	Stress		Chi-square P value	OR (95% CI)
	H/O personal problems	Yes no (%)	No no (%)		
Medical	Yes	83 (38.6)	14 (21.5)	χ2=6.42 p=0.01*	OR=2.29 (1.19-4.39)*
	No	132 (61.4)	51 (78.5)		1 (ref)
Engineering	Yes	66 (31.4)	13 (18.6)	χ2=4.28 p=0.03*	OR=2.01 (1.02–3.92)*
	No	144 (68.6)	57 (81.4)		1 (ref)
	H/O sleep disturbance				
Medical	Yes	55 (25.6)	5 (7.7)	χ2=9.48 p=0.002*	OR=4.12 (1.57–10.7)*
	No	160 (74.4)	60 (92.3)		1 (ref)
Engineering	Yes	69 (32.9)	13 (18.6)	χ2=5.17 p=0.02*	OR=2.14 (1.1– 4.1)*
	No	141 (67.1)	57 (81.4)		1 (ref)
	H/O subject difficulty				
Medical	Yes	79 (36.7)	13 (20)	χ2=6.34 p=0.01*	OR=2.32 (1.19–4.53)*
	No	136 (63.3)	52 (80)		1 (ref)
Engineering	Yes	93 (44.3)	24 (34.3)	χ2=2.15 p=0.14	OR=1.5 (0.867–2.67)
	No	117 (55.7)	46 (65.7)		1 (ref)
	H/O difficulty in time management				
Medical	Yes	137 (63.7)	27 (41.5)	χ2=10.12 p=0.001*	OR=2.47 (1.40–4.35)*
	No	78 (36.3)	38 (58.5)		1 (ref)
Engineering	Yes	121 (57.6)	24 (34.3)	χ2=11.44 p=0.001*	OR=2.6 (1.48– 4.58)*
	No	89 (42.4)	46 (65.7)		1 (ref)
*Statistically significant					

We found statistically significant association of stress with H/O personal problems OR=2.29 (95% CI: 1.19 - 4.39), H/O sleep disturbance OR=4.12 (95% CI:1.57 – 10.7), H/O difficulty in understanding the subject OR=2.32 (95% CI: 1.19–4.53), H/O difficulty in time management OR=2.47 (95% CI: 1.40–4.35) and H/O home sickness (p=0.001) in medical students whereas among engineering students, stress was associated with H/O personal problems OR=2.01 (95% CI: 1.02–3.92), H/O sleep disturbance OR=2.14 (95% CI: 1.1–4.1) and difficulty in time management OR=2.6 (95% CI: 1.48– 4.58) (Table 4). However, we did not find any statistically significant association of stress with gender, place of stay, education of mother, education of father, medium of study in school, financial problem in the family, lack of hobby, lack of sibling, and dislike in the course of study.

DISCUSSION

In our study, the overall prevalence of perceived stress among medical and engineering students was 75.8% (69.6% moderate stress and 6.2% severe stress). This is in contrast to study done by Naveen et al, where in 33.6% of the total medical and engineering students were stressed.[2] The prevalence of perceived stress among medical students in the present study was 76.8% (69.3% moderate stress and 7.5% severe stress) as compared to 75% of engineering students (70% moderate stress and 5% severe stress). This was similar to study done by Supe et al in Mumbai among medical students where 73% were stressed.[13] This finding was in contrast to study in urban India by Waghachavare et al, where proportion of stress in medical and engineering students were 25.1% and 19.7% and study in Bangalore by Naveen et al, where 32.9% of medical students and 34.2% of the engineering students suffered from stress.[2,6] In a study by Singh et al, 9.4% of medical students were stressed as compared to 6.4% of engineering students and in a study by Gupta et al in West Bengal, revealed that stress among medical students was 91.1% [moderate and high stress were 55.7% (95% CI 44.74–66.14%) and 35.4% (95% CI 25.79–46.44%)].[14,15] Another study by Saeed et al in Riyadh, Saudi Arabia, among medical students, 18.8% of them had mild stress, 17.5% moderate stress and 33.8% of them had severe stress.[16] The difference in prevalence of stress may be as the stress varies according to

environment (academic, personal etc.,) and curriculum. The scales used to measure stress in these studies are different. This might also be one of the reasons. However, the scale which we have used here in this study is perceived stress scale, which has a good validity and reliability. This scale has been applied to a wide range of settings, to different subject types and includes items measuring reactions to stressful situations as well as measures of stress.[12]

In our study, the overall mean PSS score was 17.26 (SD±6.44). Among medical students, the mean PSS score was 17.74 (SD±6.34) as compared to engineering students with mean of 16.78 (SD±6.53). This was in contrast to a study done by Pyari et al, where mean scores of stress among engineering and medical students were 5.6 and 6.01 with SD of 2.78 and 2.77 respectively.[5] However, the scales used were different. In a study by Brahmbhatt et al in Mangalore, the mean PSS score in the medical students was 27.53 (SD±7.01) and in another study by Goyal et al in Gujarat, mean PSS score in the medical students was 27.20 (SD±6.58).[17,18] Most of the previous studies have used Perceived stress scale with 14 items but we have used PSS with 10 scale item which also has good reliability and validity.[12] Our study is one of the few studies which had compared the mean stress scores of all the four year of study in both medical and engineering students. In medical students, the mean stress scores among first, second, third and fourth year were 18.86 (SD±5.99), 17.69 (SD±6.13), 17.71 (SD±6.26) and 16.60 (SD±6.87) and this difference in mean (ANOVA) was not found to be statistically significant. (p=0.25). In Engineering students, the mean stress scores among first, second, third and fourth year were 13.93 (SD±6.24), 15.87 (SD±7.80), 18.19 (SD±5.54) and 19.14 (SD ±5.02). However, this difference in mean was found to be statistically significant. (p=0.001). Among medical students, first year had increased mean stress score as compared to other year. This may be due to change in environment and vastness in subject of first year. Among engineering students, fourth year students have increased mean stress score. This may be due to project work and campus interview which they are exposed.

In the present study, among medical students, stress was associated with personal problems OR 2.29 (95% CI: 1.19-4.39), sleep disturbance OR 4.12 (95% CI: 1.57-10.7), difficulty in understanding the subject OR 2.32 (95% CI: 1.19–4.53), difficulty in time management OR 2.47 (95% CI: 1.40–4.35) and home sickness. Among engineering students, stress was associated with personal problems OR 2.01 (95% CI: 1.02–3.92), sleep disturbance OR 2.14 (95% CI: 1.1–4.1) and difficulty in time management OR 2.6 (95% CI: 1.48–4.58). In a study by Waghachavare et al medical studies, Health and lifestyle factors and Academic factors were associated with stress.[6] Another study by Waqas et al revealed that Academic factors, year of study and poor sleep was associated with stress.[19] Stressors or associated factors of stress may be varying according to circumstances, environment and individuals who perceive differently.

Our study had few limitations. Since, we have used self-administered questionnaire in our study, there may be a possibility of difference in understanding the questions among study subjects, which might alter their response resulting in information bias. Stress is not static but dynamic. It may change according to the circumstances (example: during exams stress may be more) and stressors also may change accordingly. Since it was a cross sectional study design, there is a lack of temporality between stress and its associated factors. As it was conducted in one medical and engineering college, the results of our study are not generalizable.

CONCLUSION

The overall prevalence of perceived stress among medical and engineering students of Karpaga Vinayaga Educational Group was 75.8% (69.6% moderate stress and 6.2% severe stress). The prevalence of perceived stress among medical students was 76.8% (69.3% moderate stress and 7.5% severe stress) as compared to 75% of engineering students (70% moderate stress and 5% severe stress). Among medical students, stress was associated with personal problems, sleep disturbance, difficulty in understanding the subject, difficulty in time management and home sickness whereas among engineering students, stress was associated with personal problems, sleep disturbance and difficulty in time management.

To recommend, Yoga and other stress management technique should be taught to students at their younger age and be motivated to follow the same. Education to the students regarding counselling centres is to be given. So, that counselling centres are well utilized by them. Further, prospective studies should be done to confirm the association of perceived stress and other factors. Qualitative studies involving all the stake holders (students, teachers, etc.,) to be done to bring about curriculum change if needed.

REFERENCES

1. Manjunath SM, Nagesh RG, Janardhan Singh, Ravish Kumar M. A cross-sectional study on the sources and Levels of stress among second year

Undergraduate medical students. National J Med Res. 2014;4(4):314-7.

2. Naveen S, Swapna M, Kumar J, Manjunath S. Stress, anxiety and depression among students of selected Medical and engineering colleges, Bangalore- a comparative study. IJPMN. 2015;2(2):14-8.

3. Mane AB, Kumar MKK, Paul NC, Shasidhar HG. Differences in perceived stress and its correlates among students of professional courses. J Clin Diagnos Res. 2011;5(6):1228-33.

4. Sarkar D, Saha J. Assessment of Stress among First Year Medical Students of Chhattisgarh. IOSR J Dental Med Sci. 2015:14(8):37-40.

5. Pyari D. A comparative study of anxiety and depression among medical and engineering students. Available at: https://www.worldwidejournals. com/international-journal-of-scientific-research-(IJSR)/file.php?val=March_2016_1492697543__14. pdf. Accessed on 10 August 2010.

6. Waghachavare VB, Dhumale GB, Kadam YR, Gore AD. A Study of Stress among Students of Professional Colleges from an Urban area in India. Sultan Qaboos Univ Med J. 2013;13(3):429-36.

7. Batkiene l. Stress scales for students. Available at: http://iti.vgtu.lt/ceneast/Media/Default/Documents/5 th%20Meeting/P1-2_Lina%20Bartkiene_Stress%20 scale%20presentation.pdf. Accessed on 14 Janaury 2016.

8. Eva EO, Islam MZ, Mosaddek ASM, et al. Prevalence of stress among medical students: a comparative study between public and private medical schools in Bangladesh. BMC Res Notes. 2015;8:327.

9. Koochaki GM, Charkazi A, Hasanzadeh A, Saedani M, Qorbani M, Marjani A. Prevalence of stress among Iranian medical students: A questionnaire survey. East Mediterr Health J. 2011;17:593-8.

10. Abdulghani HM, AlKanhal AA, Mahmoud ES, Ponnamperuma GG, Alfaris EA. Stress and its effects on medical students: A cross-sectional study at a college of medicine in Saudi Arabia. J Health Popul Nutr. 2011;29:516-22.

11. Iqbal S, Gupta S, Venkatarao E. Stress, Depression and Anxiety among Medical undergraduate students

and its socio demographic correlates. Indian J Med Res. 2015;141:354-7.

12. Cohen S, Kamarck T, Mermelstein R. A global measure of perceived stress. J Health Soc Behav. 1983;24:385–96.

13. Supe AN. A study of stress in medical students at Seth G. S. Medical College. J Postgrad Med 1998;44(1):1-6.

14. Singh R, Shriyan R, Sharma R, Das S. Pilot Study to Assess the Quality of Life, Sleepiness and Mood Disorders among First Year Undergraduate Students of Medical, Engineering and Arts. Journal of Clin Diagnos Res : JCDR. 2016;10(5):1-5.

15. Gupta S, Choudhury S, Das M, Mondol A, Pradhan R. Factors causing stress among students of a Medical College in Kolkata, India. Educ Health. 2015;28:92-5.

16. Saeed AA, Bahnassy AA, Al-Hamdan NA, Almudhaibery FS, Alyahya AZ. Perceived stress and associated factors among medical students. J Family Community Med. 2016;23(3):166-71.

17. Brahmbhatt KR, Nadeera VP, Prasanna KS, Jayram S. Perceived stress and sources of stress among medical undergraduates in a private Medical College in Mangalore, India. Int J Biomed Advanced Res. 2013;04(02):128-36.

18. Goyal P, Upadhyah AA, Pandit DP, Sharma D, Howale D. A study of stress, stressors, and coping strategies among students of a newly established medical college in South Gujarat. Natl J Physiol Pharm Pharmacol. 2016;6.

19. Waqas A, Khan S, Sharif W, Khalid U, Ali A. Association of academic stress with sleeping difficulties in medical students of a Pakistani medical school: a cross sectional survey. Sambunjak D, ed. Peer J. 2015;3:840.