IOSR Journal of Dental and Medical Sciences (IOSR-JDMS)
e-ISSN: 2279-0853, p-ISSN: 2279-0861.Volume 18, Issue 4 Ser. 19 (April. 2019), PP 25-30
www.iosrjournals.org

How Much Stressed Are Medical Students?

Dr.Shantanu Tapadar[1], Dr.Agnihotri Bhattacharyya[2]
[1](Associate Professor, Department of Physiology, Calcutta National Medical College, Kolkata, India)
[2](Associate Professor, Department of Community Medicine, Diamond-harbourGovernment Medical College& Hospital, West Bengal, India)
Corresponding Author: Dr.ShantanuTapadar

Abstract:*Doctors are known to work under the highest levels of stress,and even the medical students suffer a high degree of stress, as seen by reportsfrom some countries across the globe.No remedial measures have been instituted so far, asproper quantification of the problem and its causes are an essential prerequisite. An assessment of stress levels in the first year medical students, just after joining the course, and an enquiry into itscause were attempted in this study.Perceived stress was compared by the well-known tool incorporated from PSS-10, along with background data.55.2% of the 1st year students showed significant stress with 17.6% suffering from severe stress. Performance in school-leaving (Class 12) examshad a weak association with the perceived stress levels. While problems in college are a significant cause of severe stress, rising trends of nuclear family, familial problems, and staying in hostels are also causes of stress. Decrease in physical activity in boys and cultural activity in girls were seen to beassociated with rising stress levels.Relationships adversely affected the mental state of girls; while a significant and alarming increase in addictionwere seen in the severely stressed boys, when compared to individuals with mild stress.*

Keywords: *Medical students, Nuclear family, Physicalactivity, PSS-10,Stress.*

Date of Submission: 15-04-2019 Date of acceptance: 30-04-2019

I. Introduction

With modernization of the worlds and growing concerns of unemployment and unrest the world over, this unrest is also being reflected in the youth of today. The students, especially the university-goers are facing undue stress[1, 2]; and this is being reflected by the increasing incidences of addiction, crime and suicidal attempts among them[3, 4].Though these vulnerable groups of university students have come under the scanner many a times, but quantifying the magnitude of the problem as well as investigating the cause in the first year medical students in Eastern India in this present scenario is lacking. An enquiry into their life and background data may reflect varying causative agents, which may show a positive or negative correlation with the amount of negative feelings in them.

Signs of mental health disorders are not easily recognizable in majority of people. Psychological stress theory focuses on people's appraisal of events as threatening or challenging. Medical students and doctors study and work at the highest level of stress [5], dealing with human lives;and this stress in the medical students are nowbeing studied in many countries across the world [6, 7, 8].A few sporadic data available from some parts of India report high to very high stress levels amongst medical students in India [9, 10]. Suicides are being reported every year from medical students studying in different medical colleges of West Bengal, and this study is an attempt to focus into the life of these students – how stressful they feel during these years and any significant cause of stress if it can be identified.

II. Methodology

A descriptive, observational and institutional based study was carried out amongst the 1st year Medical students of Calcutta National Medical College, Kolkata, three months after their admission, as per availability, and which formed the study population.In thiscross-sectional study design, total enumeration method was followed for sample collection with prior approval of Institution Ethics Committee. The intention of the study was explained to the students,and those participants who volunteered were asked to provide informed written consent for the study. Of the 150 first year medical students, 126 volunteered and gave consent to participate, but eventually the data collected from one participant was incomplete andwas thus excluded from this study.

The study tool included a pre-designed, pre-tested questionnaire incorporated from Perceived Stress Scale-10 (PSS-10) to identify perceived stress among the study population. Perceived Stress Scale, introduced by Dr.Cohen in 1983 [11], serves for comparisons within a sample, and had been used widely in studies of both mental and physical health and also amongst college students [12]. Each item on the questionnaire is rated on a

5-point scale ranging from never (0) to almost always (4), and positively worded items are reverse scored. PSS-10 scores are obtained by reversing the scores on the four positive items, i.e. items 4, 5, 7, and 8: for example, 0=4, 1=3, 2=2, etc.; and then summing across all 10 items. Higher scores indicate more perceived stress. The PSS is a measure of the degree to which situations in one's life are appraised as stressful. Items were designed to tap how unpredictable, uncontrollable, and overloaded respondents find their lives, and its 10-item version (PSS-10) had maximum reliability and has been translated in different languages [13].The study technique involved self-response to the said questionnaire of PSS-10 supplemented with collection of background data in a separate form.

The data was compiled in Microsoft Excel 2010and analysed with appropriate statistical tests. Student's unpaired *t*-test was applied for comparison between subgroups. Pearson rank correlation coefficient was applied for correlation between the marks obtained by the subjectsand the PSS-10 scores.The z-score test wasapplied for comparison between two population proportions and with a two-tailed hypothesis, a p-value of $p<0.05$ taken as a significantfinding.

III. Results

A total of 125 students formed the study population of which there were 64 male and 61 female students. The PSS-10 scores recorded from the study population were analysed and are represented in Table 1. 69 students out of 125 (55.2%) showed moderate to severe levels of stress. All the 61 female students showed some degree of stress.

Table no 1: Shows Perceived Stress Scale – 10 scores in the Study Population

PSS – 10 Score		Category	Study Population		Subgroups	
Males	Females				Male	Female
0 – 6	0 – 7	No Stress / Normal	02	1.6%	02	0
7 – 17	8 – 19	Mild Stress	54	43.2%	24	30
18 – 23	20 – 25	Moderate Stress	47	37.6%	26	21
24 – 40	26 – 40	Severe Stress	22	17.6%	12	10
Total			125		64	61

A visual representation of the magnitude of the various levels of stress in the study population can be seen in the adjoining Pie chart (Fig.1).Only 2 students (1.6%) had a PSS score <6 and showed no stress, while moderate levels of stress was seen in 38% and severe stress in 18% students.

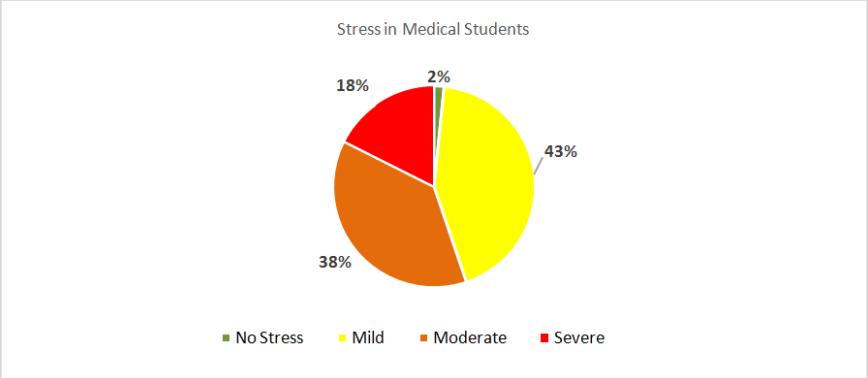
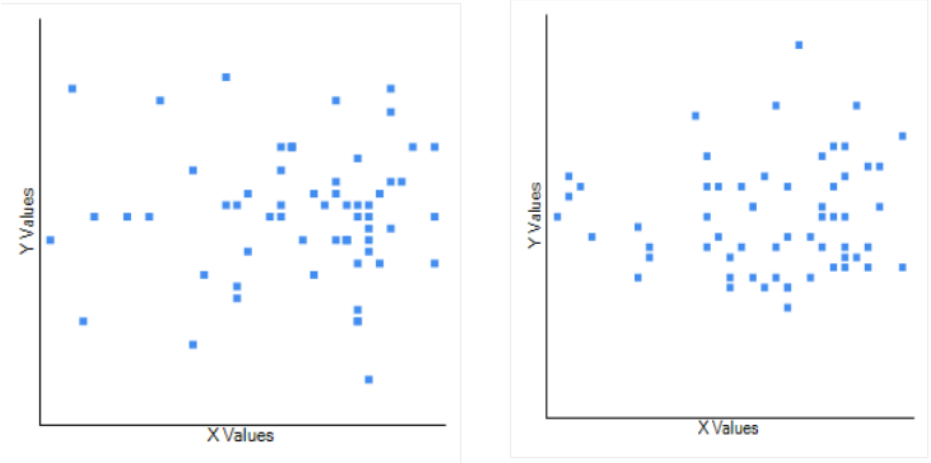


Figure 1: Pie Chart showing stress levels in total study population**.**

Table 2 shows the attempt to correlate the level of academic performance of the students, the Class XII or School-leaving marks, with the PSS scores, by employing the Pearson Correlation coefficient. The latest academic performance of the students, a measure of the merit in them, is assessed separately in both male and female students. The scatter diagram of male population (Table 2A) shows a negative correlation, albeit weak, with an R value of -0.0052, and ap-Value of 0.969493, not significant at $p<0.05$. The scatter diagram of the female students (Table 2B) show a weak positive correlation, with an R value of -0.0548, and ap-Value of0.677511, not significant at $p<0.05$.

Table no 2: Shows Pearson Correlation Coefficient and scatter diagram in Male (A) and Female (B) medical students between the % marks obtained in Class XII (school leaving) examination and PSS-10 scores of perceived stress (X-axis: % marks in Class XII exam ; Y-axis: PSS-10 Score).

(A) Male Students: (B) Female students:



The 'Joint family' with the grandfather, grandmother and aunts or brothers and sisters living in the same home is prevalent in this part of India, even today. A rising trend observed in families movinginto apartments and forming 'nuclear' families with the father, mother and child has been implicated in a lot of mental health problems, including stress. In Table 3, a high stress level of 61% is seen in male students living in nuclear families (36 students with high stress scores out of total 59 male students living in nuclear families), and 49% in female students (24 out of 49). Additionally, 7 female students out of the 12 females (58.3%) living in joint families showhigh stress scores.Neither of the p-values are significant at $p<0.05$, owing to the high prevalence in both subgroups.

Table no 3: Shows a comparison and association of family composition of Joint family and Nuclear family with high PSS scores (PSS>17 in males andPSS>19 in females)

	Joint family		Total	Nuclear family		Total	Z score	P-value
	High Stress	Low/No Stress		High Stress	Low/No Stress			
Male	2	3	5	36	23	59	-0.9187	0.35758
Female	7	5	12	24	25	49	0.5809	0.56192
Total	9	8	17	60	48	108		

More students staying in Hostel or Mess show high stress levels than students who commute daily to college (i.e. day-scholars), as can be seen in Table 4. A high percent of total females, i.e. 54.5%, living in hostel show very high degrees of stress compared to 46.4% day-scholars. An alarming 62.1% of Males living in hostels suffer from high levels of stress.

Table no 4: Compares thelevels of Stress in male and female students who stay in Hostel or Mess, with Day-scholars

	Males			Females		
	Low/Mild Stress	High Stress (PSS>17)	Total	Low/Mild Stress	High Stress (PSS>19)	Total
Day-scholars	12	15 (55.6%)	27	15	13 (46.4%)	28
Hostel/Mess	14	23 (62.1%)	37	15	18 (54.5%)	33
Total	26	38	64	30	31	61

The extent of perceived Stress in males and females of the study group were compared and correlated with probable causes in Table 5. The severity of stress was classified as 'High Stress'in PSS>17 in males and >19 in females, as before. High levels of stress in females was seen to be associated with a significant decrease in physical activity, and decreased cultural activity too.Similarly males engaged in physical and cultural activity showed lower stress levels. Relationship with the opposite partner might be a stresser for the females, as approx.

one-third (32%) of highly stressed females were in a relationship. A larger number of stressed, both male and female, students wanted to change the medical stream if given a choice. Students with higher levels of stress report more family problems, seen equally in both boys and girls. The highly stressed male students had significantly more problems with College,than students with low stress levels, though no specific problems pertaining to college was mentioned by the students.

Table no 5: Shows levels of Stress in the study population and who stay in Hostel or Mess with Day-scholars

		Males (n=64)				Females (n=61)				Total (n=125)			
		Normal/ Mild (n=26)	PSS>17 (n=38)	Z	P	Normal/ Mild (n=30)	PSS>19 (n=31)	Z	P	Normal/ Mild (n=56)	High stress (n=69)	Z	P
1	Physical activity	20 (77%)	22 (58%)	1.5741	0.116	19 (63%)	10 (32%)	2.4297	0.015	29	32	0.6016	0.548
2	Cultutal activity	7 (27%)	7 (18%)	0.8081	0.417	15 (50%)	11 (35%)	1.1461	0.25	22	18	1.5731	0.116
3	Relationship	3 (12%)	3 (8%)	0.4912	0.624	8 (27%)	10 (32%)	-0.478	0.631	11	13	0.1132	.9124
4	Opt to change course	2	7	-1.212	0.226	1	3	-1.000	0.317	3	10	-1.6639	0.096
5	Problems in family	2 (7.7%)	4 (10.5 %)	-0.382	0.703	5 (16.7%)	6 (19.4 %)	-0.273	0.787	7	10	-0.3232	0.748
6	Problems in college	2	11	-2.075	0.037	3	5	-0.708	0.477	5	16	-2.12	0.034

High levels of stress can have negative impacts and can lead to anxiety, depression, suicidal thoughts or alcohol and substance abuse. Table 6 records addiction reported by males, and their association with stress. Addiction can be seen to steadily rise from 7.7% in the group with mild stress, through 15.4% in the moderate stress group, to 33% in the students suffering from severe stress; a significant finding with a p-value of 0.04.

Table no 6: Shows addiction in male students and its relation to stress

	Addicted	Not Addicted	Total	Z-score (between Mild & Severe stress)	P-value (between Mild & Severe stress)
Normal/ Mild stress	2 (7.7%)	24	26	-2.0149	0.04444
Moderate stress	4 (15.4%)	22	26		
Severe stress	4 (33.3%)	8	12		
Total	10	54	64		

IV. Discussion

Stress can lead to interruptions in both physical and mental health and chronic stress can affect the brain's learning and memory [14]. A recent discovery shows short-term stress, lasting as little as a few hours, can also impair brain-cell communication in critical areas like hippocampus, the brain's primary learning and memory center [15].The present study aimed to determine the extent of stress perceived among first year medical students, a few months after starting the course.

Our study showed all 100% of the female and 97% male students reporting some degree of perceived stress levels – mild, moderate or severe. In our study we find that only1.6% had a PSS score <6 and showed no stress; while43.2% reported mild,37.6% moderate, and17.6% students reported severe levels of perceived stress.A recent study by Nitin Joseph and his colleagues from Kasturba Medical College, Manipal University, Mangalore, reported similar findings from amongst medical students in South India which show 3.0% low, 49.5% average, and 47.5% perceived high levels of stress, with a different stress questionnaire developed by the International Stress Management Association [10]. But some parts of India like Puducherry report about 83.7% of the medical students having moderate, high, and very high stress level; in a recent study done by Ganesh Kumar and his associates from JIPMER, Puducherry, India [16]. Thus varying stress levels have been reported amongst medical students from different parts of India.

A general idea is that more meritorious students suffer from higher stress levels: owing to higher expectations from family members and others, as well as a more competitive attitude within their peer–group. But our study failed to show any correlation between academic performance and stress levels.

Family composition, especially nuclear families, have been revealed as a factor for stress – 61% males and 49% females living in nuclear families show high levels of stress. Understandably people get few persons to communicate and relieve their stress in these small-family set-ups.

The initial few days and months of college are a challenge to adjust to a new environment, and hostel or mess can cause stress for many. In fact 62.1% of the male boarders and 54.5% of female boarders living in a hostel or mess recorded high levels of perceived stress, showing much more stress than those who commute from their home.

Physical activities like playing, swimming, or exercises and cultural activities like singing, dancing or playing musical instruments can be a huge de-stressor. Only one-third (32% and 35%) of highly stressed females engaged in physical and cultural activity; while among the mild-stressed group almost 2/3rd (63%) of females engaged in physical, and half of them in some form of cultural activity. Of the males who were less stressed, 77% engaged in physical and 27% in cultural activities. Thus Physical or cultural activities should be encouraged in the medical students who are exposed to such high levels of stress.

Problems in family are a cause of high stress in both boys and girls; but problems in College is a 'stressor' for a significant number of boys who report high perceived stress. The nature of the problem in college was not revealed by the students, possibly due to fear of being disclosed. More girls reported being in relationships with the other gender: 30% girls compared to only 9% boys; which might very well be another cause of high perceived stress noted in girls.

A desire to leave this medical stream, if given a choice, has been noted especially in the students with higher levels of perceived stress. A dangerous trend towards addiction amongst adolescent was noted and stress is an important cause of this deviation. Our study clearly shows a significant rising addiction rates with higher perceived stress levels in male medical students, and 33% of the severely stressed boys were addicted. This reminds one of the words of Dr. David Hilfiker, M.D. in his famous book 'Healing the wounds: A Physician Looks at His Work': "….the United States loses the equivalent of seven medical-school graduating classes each year to drug addiction, alcoholism, and suicide."

V. Conclusion

In this study, 55.2% of the first year medical students recorded high perceived stress levels, with 17.6% showing severe stress.As stress adversely affects the mental and physical health of individuals, an attempt was made to identify the different stressors in this study.Both male and female students living in small nuclear families are more stressed, as are the students living in Hostels and Mess. Physical and/or cultural activities may help bringing down the stress and should be promulgated for both boys and girls studying Medicine, as it has been shown to be one of the highest stressful courses. Problems in college and families are causes of high stress in students, and may cause students to dislike and leave studies, or become addicted. Stress-relieving techniques should be taught to medical students and appropriate measures incorporated in the medical curriculum to help decrease stress and its related complications.

Limitations of the study

The study was intended to quantify the amount of perceived stress among the 1st-year medical students, and search for factors which make their life stressful. Thus the study setting in a single medical college provided for a small sample size, with its inherent limitations. A similar assessment in other medical colleges can compare and remove inadvertent bias involved from collecting data from a single source.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

References

[1]. Cohen S, Janicki-Deverts D, Who's Stressed? Distributions of Psychological Stress in the United States in Probability Samples from 1983, 2006, and 2009,*Journal of Applied Social Psychology, 42(6),* 2012, 1320–1334. doi: 10.1111/j.1559 1816.2012.00900.

[2]. Jafri SA, Zaidi E, et al, Stress Level Comparison of Medical and Non-medical Students: A Cross Sectional Study done at Various Professional Colleges in Karachi, Pakistan,*ActaPsychopathologica, 3(2:8),* 2017, 1-6.

[3]. Wong SS, Zhou B, Goebert D, Hishinuma ES, The risk of adolescent suicide across patterns of drug use: a nationally representative study of high school students in the United States from 1999 to 2009,*Soc Psychiatry PsychiatrEpidemiol.,* 2013 Jun 7. PMID: 23744443

[4]. Meng H, Li J, Loerbroks A, Wu J, Chen H, Rural/urban Background, Depression and Suicidal Ideation in Chinese College Students: A Cross-Sectional Study, *PLoS One, 8(8),* 2013 Aug16;e71313. PMID:23977015.

[5]. Supe AN, A study of stress in medical students at Seth G.S. Medical College, *J Postgrad Med., 44(1),* 1998 Jan-Mar, 1-6, PMID:10703558.

[6]. Erschens R, Herrmann-Werner A, et al, Differential determination of perceived stress in medical students and high-school graduates due to private and training-related stressors,*PLoS One, 13(1),* 2018, e0191831, doi.org/10.1371/journal.pone.0191831

[7]. Khorvash F, Askari G, et, al, Investigating the anxiety level in Iranian medical residents in 2010-2011,*Int J Prev Med., 4(Suppl 2),* 2013 May, S318-22,PMID:23776745.

[8]. YusoffMS,Associations of pass-fail outcomes with psychological health of first-year medical students in a malaysian medical school,*SultanQaboosUniv Med J., 13(1),* 2013 Feb, 107-14, Epub 2013 Feb 27, PMID: 23573390.
[9]. Rebello CR, Kallingappa PB, Hegde PG, Assessment of perceived stress and association with sleep quality and attributed stressors among 1styear medical students: A cross-sectional study from karwar, Karnataka, India, *Tzu Chi Medical Journal, 30(4),* 2018; 221–226.
[10]. Joseph N, Panicker V, et. al, Assessment and Determinants of Emotional Intelligenceand Perceived Stress Among Students of a MedicalCollege in South India, *Indian Journal of Public Health, 59(4),* October-December, 2015, 310-313.
[11]. Cohen S, Kamarck T, Mermelstein R, A global measure of perceived stress, *Journal of Health and Social Behavior, 24,* 1983, 385-396.
[12]. Cohen S. &Williamson G., Perceived stress in a probability sample of the United States,in S. Spacapam& S. Oskamp (Eds.), *The social psychology of health: Claremont Symposium on applied psychology*(Newbury Park, CA: Sage, 1988) 31-67.
[13]. http://www.psy.cmu.edu/~scohen/scales.html
[14]. Lindau M, Almkvist O, Mohammed AH, Effects of Stress on Learning and Memory, *Stress: Concepts, Cognition, Emotion, and Behavior,* (Elsevier, 2016) 18, 153-160, http://dx.doi.org/10.1016/B978-0-12-800951-2.00018-2
[15]. Nauert R, Stress affects learning and memory, *Psych Central*,psychcentral.com/news/2008/03/12/stress-affects-learning-and-memory/2031.html
[16]. Kumar SG, Kattimani S, Sarkar S, Kar SS, Prevalence of depression and its relation to stress level among medical students in Puducherry, India, *Ind Psychiatry J, 26,* 2017, 86-90.

Dr.ShantanuTapadar. "How Much Stressed Are Medical Students?" IOSR Journal of Dental and Medical Sciences (IOSR-JDMS), vol. 18, no. 04, 2019, pp 25-30.