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Stress and its Consequence on Medical Students: A Cross Sectional Study at Medical College in Western India

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ABSTRACT

Background: A student in MBBS course commonly faces various kinds of stressors. This study was conducted to study the prevalence of stress and its consequences in medical students of Gujarat Adani Institute of Medical Sciences (G.A.I.M.S.), Bhuj

Material and Methods: This cross sectional study was conducted in 2015 using a self-administered questionnaire inspired from Kessler 10 psychological distress instrument (K10).

Results: Out of 750 subjects, 213 students completed the questionnaire. The prevalence of stress was 44.1% and it was highest among students of the third year part-II (49.25%), followed by students doing internship (49.01%), students in third year part-I(45.95%), students in second year (44.44%)and first year students (13.86%). There was statistically significant association between the language of study in pre-university level, student being hostelite, performance in MBBS exams, attendance in classes and presence of stress.

Conclusion: Such studies should do at every medical college and the stressors should be identified so timely action taken against it will prevent any effects caused on students. As we found out that the stress levels did increase with year of study, more support is required for the students in final year and medical colleges should stress-prevention strategies. Appropriate programmes for the recreation of the students must be developed to prevent the stress.

Key words: Stress, Medical student, Bhuj

INTRODUCTION

Epidemiological studies have reported that about 70–80% of the diseases may be related to stress.[1] Stress is defined as the body's nonspecific response or reaction to demands made on it, or to disturbing events in the environment.[2] It is not just a stimulus or a response but it is a process by which we perceive and cope with environmental threats and challenges.[3] The same stressors may be perceived differently by different individuals, depending on cultural background, coping skills etc.[4] A stressor is defined as a personal or environmental events that causes stress.[5]A student in MBBS course commonly faces various kinds of stressors such as vastness of syllabus, language problems, more frequency of examination, homesickness, high parental expectations, lack of time for recreation & improper quality of food in mess etc. Studies have shown that medical students experience a high level of stress during their undergraduate course.[1-10] There is some paucity of research to be done in state of Gujarat and Gujarat Adani Institute of Medical Science, Bhuj being an upcoming medical college we conducted a research to find out the prevalence of stress among the students

MATERIALS AND METHODS

The study was conducted in Gujarat Adani Institute of Medical Sciences, Bhuj, Kutch during the period of 1st of August 2015 to 31st October 2015. We used the Kessler 10 psychological distress instrument (K10) developed by Kessler and colleagues. This instrument has been used widely in population-based epidemiological studies to measure current (1-month) distress and was in English, Hindi and Gujarati languages, including, to measure the level of stress and severity associated with psychological symptoms in population surveys. The World Mental Health Survey of the World Health Organization used it as a clinical outcome measure.[11-14]The K10 consists of 10 questions in the form of "how often in the past month did you feel ..." and offers specific symptoms, such as 'tired out for no good reason', 'nervous', and 'sad or depressed'. The five possible responses for each question range from 'none of the time' to 'all of the time' and were scored from 1 to 5 respectively. All the questions were collated to obtain a total score. The total score was interpreted as follows: a score of less than 20 was considered not to represent stress of any level while a score of 20-24 represented mild stress, 25-29 represented moderate stress, and 30- 50 represented severe stress.[12]The questionnaire had also additional questions relating to academic achievement, sources of stress, and any perceived medical illness, regularity in attendance, medium of study, location of family, type of accommodation. Responses to additional questions relating to academic achievement, attendance in the classes, relationship with fellow students, education level and economic condition of parents, availing loans, sources of stress, medical illness in the past four weeks, and how many days a student was not able to work were also collected.

All the male and female medical students in the all the male and female medical students in the MBBS course at Gujarat Adani Institute of Medical Sciences, Bhuj, were invited to complete the multilingual version of the K10 self-administered, anonymous questionnaire during the 2015-2016 academic year. The medical students who were on antipsychotic drugs, those who were absent on the day of the survey and those who refused to participate were excluded from the study. The completed questionnaires were collected two months before the examination period so that the actual examination stress would not affect the responses of the students. The students were allowed to respond in their own time and privacy. The participation was entirely voluntary.

The data were entered in Microsoft Excel and analyzed using the Epi info software and MS Excel. The outcome variable—stress—was categorized dichotomously as stress (no/yes). The three levels (mild, moderate, and severe) of stress were put into one category and titled as 'presence of stress'. Descriptive statistics (mean, standard deviation, and percentages) were used for summarizing the study and outcome variables. Pearson's chi-square test and odds ratios were used for observing and quantifying the association between a categorical outcome (i.e. the stress level) and different study variables. The 95%confidence intervals were calculated for both odds ratios (unadjusted and adjusted).A p value of <0.05was considered significant. We applied multiple logistic regression for the variables significantly associated with stress.

All students who participated in the study were informed about the objectives of the study, and the information about the instrument was explained by well-trained students who acted as research assistants. Approval for conducting the study was obtained from the research ethical committee of the Gujarat Adani Institute of Medical Sciences.

RESULTS

In total, 213 (28.4%) of approximately 750 students completed the questionnaire. Their mean (±standard deviation) age was 21.2 (±1.7) years. The characteristics of the study subjects are shown in Table 1. The prevalence of stress of all levels was about 44.1%, and the prevalence of severe stress was 4.7%, moderate stress 9.4%, mild stress 30% and 55.9% had no stress (Table 2). Only 2 students reported physical problems due to stress. The proportion of female students who had stress was marginally higher (46%) than their counterpart males (43%) but was not statistically significant [$\chi 2$=0.08, odds ratio (OR) =0.89, p>0.05]. There was no significant association between gender of the student and level of stress (mild, moderate, severe) ($\chi 2$= 0.15 and p=0.7)

The prevalence of stress was the highest among students of the third year part-II (49.25%), followed by students doing internship (49.01%), students in third year part-I (45.95%), students in second year (44.44%) and first year students (13.86%). There was a significant association between the year of study of student and the stress levels ($\chi 2$ =9.55, p<0.05). The odds ratios were 5.06 (second year), 5.38 (third year part-1), 6.14 (third year part-2), and 6.09 (internship) respectively while the first year was considered the reference category.

The association between the academic grades of the students in 12th standard and the presence of stress was not significant ($\chi 2$ =0.166, p=0.684). But the association was significant between the grade of student in previous semester and presence of

stress ($\chi2$=6.06, p=0.013). One trivial finding was that the presence of stress was not significantly associated with fear failing ($\chi2$=1.67, p=0.20). The association between the regularity in attendance of students and stress was significant ($\chi2$=3.78, p=0.05, OR=1.86). There was no significant association between desire to do post graduation and stress ($\chi2$=0, p=0.9).Also there was no significant association between the presence of stress and having doctor parents ($\chi2$= 2.45, p=0.12).

There was significant association between the medium of study in 12th standard and stress ($\chi2$=7.3, p=0.007). There was no significant association between the loan taken for study and stress ($\chi2$=0.008, p=0.9).There was no significant association between the quota of admission and the stress level ($\chi2$=0.001, p=0.9). There was no significant association between the family location and stress ($\chi2$=0.317, p=0.85). There was significant association between the type of accommodation the students are having rented house or hostel. Only 4 students were having home at Bhuj. Only 2 students were exposed to ragging.

On applying the multiple logistic regressions, we found the medium of study in 12th standard (pre-university), year of MBBS study and place of accommodation to be significantly associated with presence of stress in students.

Table 1: Association between stress and study variables (univariate analysis)

Study Variable	Stress		p-value	OR(95% CI)
	Present (n=94) (%)	Absent (n=119) (%)		
Gender				
Female	38 (46)	45 (54)	0.69	1.12 (0.64-1.94)
Male	56 (43)	74 (57)		
Medium of study in 12th standard				
Gujarati	81 (49)	84 (51)	0.008	2.65 (1.28-5.25)
English	13 (27)	35 (73)		1
Percentage of marks in 12th standard				
<80	33 (42.3)	45 (57.7)	0.68	0.89 (0.5-1.56)
>80	61 (45.2)	74 (54.8)		1
Regularity in attendance				
No	65 (40)	96 (60)	0.05	0.54(0.28-1.0)
Yes	29 (56)	23 (44)		1
Year of study				
1st	3 (14)	19 (86)	<0.05	1
2nd	16 (44)	20 (56)		5.06 (1.27- 20.21)
3rdpart-1	17 (46)	20 (54)		5.38 (1.35-21.37)
3rd part-2	33 (49)	34 (51)		6.14 (1.66-22.74)
Internship	25 (49)	26 (51)		6.09 (1.60-23.15)
Good grades in previous semester (n=199#)				
No	37 (60)	25 (40)	0.013	2.14 (1.16-3.94)
Yes	56 (41)	81 (59)		1
Fear of failing				
Yes	16 (55.2)	13 (44.8)	0.2	1.67(0.76-3.67)
No	78 (42.4)	106 (57.6)		1
Education loan taken				
Yes	35 (43.8)	43 (56.2)	0.931	1.02(0.58-1.79)
No	59 (44.4)	74 (55.6)		1
Quota of admission				
Management	8 (44.4)	10 (55.6)	0.98	1.01 (0.38-2.67)
Regular	86 (44.1)	109 (55.9)		1
Desire to do post graduation				
Yes	49 (44.1)	62 (55.9)	0.99	1.00(0.58-1.72)
No	45 (44.1)	57 (55.9)		1
Doctor parents				
No	87 (46)	102 (54)	0.12	2.07(0.82-5.22)
Yes	7 (29.2)	17 (70.8)		1
Location of the family				
Other city	91 (44.4)	114 (55.6)	0.7	1.33 (0.3-5.71)
Same city	3 (37.5)	5 (62.5)		1
Accommodation (n=209*)				
In rented house	24 (80)	6 (20)	<0.001	6.58 (2.56-16.93)
Hostel	68 (37)	112 (63)		1

#- 14 students had just not given any university exam; *- 4 students were localities of Bhuj

Table 2: Prevalence of stress and physical problem

Variable	Cases (n=213) (%)
Status of Stress	
No stress	119 (55.9)
Mild	64 (30.0)
Moderate	20 (9.4)
Severe	10 (4.7)
Perception of physical problem	
Yes	2 (1)
No	211 (99)

DISCUSSION

A high prevalence of stress among medical students is a reason of concern as it may affect behaviour and attitude of students, attenuate learning, and ultimately disturb patient care after their graduation. The mean age of respondents was similar with the studies from Ahmedabad[10], Surat[8], Mumbai[9], Agartala[6], Manipal Medical Campus, India[15] and Agha Khan University, Pakistan.[16]Their mean (±standard deviation) age was 21.2 (±1.7) years**.** Saniet al[17], noted in their study that females being more stressed (77%) than the males (64%). Similarly Shahida et al[18] also found that female students (55%) were more affected than male students 45%. While the studies done at Surat[8] and Agartala[6] did not suggest any significant association between the presence of stress and gender. In our study we noticed that female were marginally more stressed 46% as compared to male 43%, which is similar to finding by Chauhan et al.[10]But was not statistically significant[$\chi 2$=0.08, odds ratio (OR)=0.89, p>0.05].There was no significant association between gender of the student and level of stress (mild, moderate, severe) ($\chi 2$= 0.15 and p=0.7).

The overall prevalence of stress in our study was (44.1%) similar to a study in Egypt (43.7%)[19], or a Malaysian study (41.9%)[20], and a British study (31.2%)[21]is much lower to finding of a study done in Ahmedabad[10], Surat[8], Mumbai and Agartala[6], Nepal[22], Thai study[23]. This could be either due to the different instruments used in other studies or it could be a real difference. We in our institute carry out a mentoring programme which may be one of the reasons for less prevalence of stress in our students.

Shahida et al[18], found in their study that first year and final year students were more in trouble 75 and 71% respectively, as compared to second, third and fourth year batches 65%, 45% and 33% respectively. Marjaniet al[24], also noted that the prevalence of stress was higher (73.33%) in first year of study followed by second year (55.31%) and third year (53.33%). Shaikh BT et al[16], noted that the senior students of the fourth and final year feel more stressed 95% and 98% respectively. While the studies in Surat[8] and Agartala[6] suggested the level of stress was less in 2nd year. On the contrary, Mahajan[27] and Miller[28] reported that the first year was the period of maximum stress. The prevalence of stress was lower in our study over all but there was significant difference between the years of study of MBBS course and was significant. An interesting finding of the present study was that the level of stress increased as the year of study progressed. The prevalence of stress was the highest among students of the third year part-II (49.25%), followed by students doing internship (49.01%), students in third year part-I (45.95%), students in second year (44.44%) and first year students (13.86%). This may be due to the reason that students would be getting sensitized about the seriousness of the MBBS course and syllabus would be getting vast with the passage of year of study which shall be the reason for stress. Again after the completion of MBBS course the students might be getting worried about their post graduation studies and future prospects. An almost similar conclusions was made by Sherina et al.[20] However, it differed from a study conducted in Mumbai, India, where stress was significantly more among 2nd and 3rd year compared to first year MBBSstudents.[9] Again, contradictory results were observed from the studies conducted in Malaysia[25] and Riyadh, Saudi Arabia[7] that stress significantly decreased with the increment of year of study, except for the final year. A study in Multan also found significant association between the prevalence of anxiety and depression with the respective year of medicalcollege.[26]

In present study, the proportion of participants having severe stress(4.7%), moderate (9.4%) and mild (30%) was lower than a study conducted in Surat, India where 55.6% reported mild to moderate stress and41.2% had severe stress.[8] A study from Riyadh, Saudi Arabia showed that prevalence of severe stress was 25%.[7] Conversely, it was higher than the findings of Thai study where 2.4% had severe stress.[23] Again, the prevalence of mild and moderate stress in our study was higher than the finding from a study conducted in Gorgan, Iran.[24]

The association between the academic grades of the students in 12th standard and the presence of stress was not significant ($\chi 2$ =0.166, p=0.684). The marks in 12th standard (pre-university level) have a part to play as the serve as basis to detect the student's intellect level. The interest in medicine field and vastness of syllabus might have a part to play. But the association was significant between the grade of student in previous semester and presence of stress ($\chi 2$=6.06, p=0.013).Those students who did well in the university exams of previous semester were less stressed. This may be due to the

reason they might be in the position to cope up with academic as well as non academic stressor. One trivial finding was that the presence of stress was not significantly associated with fear failing ($\chi2=1.67$, $p=0.20$).The reason for this finding may that fear might not be having an impact to result in to stress.

The medium of study in 12th standard (pre-university level) does play a significant role in comprehending the MBBS learning. It has been documented in several studies[6-10] that if language of study in pre-university level in vernacular then it is one the stress. We found the association between the presence of stress and the language of study in pre-university statistically significant.($\chi2=7.3$, $p=0.008$, OR=2.65). There was no significant association between desire to do post graduation and stress ($\chi2=0$, $p=0.9$). The desire to do post graduation and great expectations from the parents has a part to play on mental health of the students but this aspect was having significant association. The association between the regularity in attendance of students and stress was significant ($\chi2=3.78$, $p=0.05$, OR=1.86). The attendance in lectures and tutorials play a very significant role in learning the subject, if the attendance is poor the learning will be hampered resulting in stress[7].Home sickness is documented to be one of the stressor for medical students[10]. But in our study we did not find it significantly associated with presence of stress. Medical college tution fees are quite expensive so at times the students and their parents are required to avail education loans which may itself lead financial worries adding to the stress of the parents and students. But in our study did not find it significantly associated. The type admission quota (regular or management) also play a significant role as the fees as per government quota are quite less as compared to that of the fees charged for management quota. This may act as a stressor but in our study find did not find any significant association between the type of admission and presence of stress.

Limitation

This cross-sectional based study was done during the period of August 2015 to October 2015 so it provides the prevalence and level of stress prevailing in the students of that period only. Also it was based on self reported information provided by the students. There may be some bias on the part of students and under the influence of their emotions they might project their shortcoming on to the other individual or party. This study was carried out in Gujarat Adani Institute of Medical Sciences so it provides the prevalence and level of stress in that medical college only. Findings of this study can be extrapolated to other medical colleges in Gujarat and India

CONCLUSION

After our study we concluded that the level of psychological stress increased in students with increase in year of study and the medium of study in pre-university level did play as part. Also the regularity in attending the classes, getting good grades in college exams and stay in hostel were good coping mechanism for students who were in stress.

Such studies should be done at every medical college and the stressors should be identified so timely action taken against it will prevent any effects caused on students. As we found out that the stress levels did increase with year of study, more support is required for the students in final year and medical colleges should stress-prevention strategies. Appropriate programmes for the recreation of the students must be developed to prevent the stress. This will result in an improved academics performance from the students.

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