CROSS-SECTIONAL STUDY ON EXAM ANXIETY AMONG MEDICAL STUDENTS OF A TERTIARY CARE TEACHING HOSPITAL OF WESTERN INDIA

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ABSTRACT

Background: Students with test anxiety feel tense, fearful and worried in evaluative situations. This study was carried out with the objective to find out the levels of exam anxiety and factors contributing to it.

Methodology: It was a cross-sectional study conducted among 150 randomly selected medical students with the help of a tool used for measuring exam anxiety, Test Anxiety Inventory (TAI).

Results: The mean score of TAI-worry was 16.95 (+ 3.39), TAI-emotionality was 17.04 (+ 2.901) and that of TAI-total was 41.99 (+5.336). The TAI-emotionality subscale and TAI-total scores was higher in female medical students. Those students who were living in hostel had higher mean TAI-emotionality scores. No significant difference between TAI-worry, TAI-emotionality and TAI-total with respect to regular/repeater batch, parental pressure, extent of course of study and duration of exams. No association was found TAI-total with year of study in MBBS and medium of study in higher secondary education.

Conclusion: The total anxiety scores were significantly higher among female medical students. The emotional effect of exam anxiety was significantly higher among the female medical students than the males and among the students living at hostel than those living with their families.

Keywords: Exam anxiety, test anxiety, medical students, test anxiety inventory.

INTRODUCTION

Some level of nervousness before tests can motivate you; however, too much stress can interfere with your ability to prepare for and perform on tests. Worry (that is, thinking about failure rather than preparing to succeed) is more harmful. Test anxiety affects many people of all ages and intelligence, and its symptoms are rooted in your biological "fight or flight" response. Anxiety can distort your view of reality. Test anxiety has been identified as a debilitating psychological syndrome. Some kind of physical or emotional anxiety is common to most test takers. Some people live in dread of a moment when their brains "go blank." Others experience gastrointestinal problems, headaches, or profuse sweating.

Students with test anxiety feel tense, fearful and worried in evaluative situations.[1,2] Research relating test anxiety to academic performance has established that high levels of test anxiety are associated with lower levels of students' learning and performance.[3] Often test-anxious students at all levels of education perform more poorly on standardized tests[4] and receive poorer grades[5] than they

ought to because anxiety and other test-taking deficiencies interfere with their performance, either directly or indirectly.[6,7,8,9] This research was carried out with the objective to find out the levels of exam anxiety among medical students and the variables affecting it.

METHODOLOGY

Study setting: The study was conducted among medical students of Government Medical College, Bhavnagar. The medical college is functional since the year 1996 and is attached to a tertiary care hospital, which is catering to around thirty lakh population of Bhavnagar district.

Study design: It was a cross-sectional study conducted among medical students.

Study duration: The study was carried out for a period of 4 months from May-August 2015.

Sample size: The study was conducted on a calculated sample of 150 medical students who were currently giving their university theory exams (external exams) in the medical college. The sample size of 150 was calculated with the help of Open Epi[10] version 2.2, based on a pilot study of 30 medical students, wherein the proportion of exam anxiety among them was found to be 11% (at 5% absolute precision and 95% confidence level).

Sampling design: The sampling was done with the help of Open Epi version[10] 2.2 by Simple Random Sampling method, with all the students studying in 1st year, 2nd year and 3rd year part 1 of MBBS constituting the sampling frame. Out of the total 447 students in the sampling frame, 150 random numbers were generated with the help of Open Epi[10] software and these students were included in the research.

Data collection: The data collection tool included a few basic questions on the socio-demographic profile, year of study, parental pressure, etc. The tool used for measuring exam anxiety was Test Anxiety Inventory.[11]

Test Anxiety Inventory (TAI): The TAI is a self-report psychometric scale that was designed by Spielberger[11] to "measure individual differences in test anxiety as a situation-specific personality trait". The TAI was developed for use with adolescents and adults and consists of 20 items that ask respondents to indicate how they generally feel in test situations by reporting the frequency that they experience specific symptoms of anxiety before, during and after examinations. Respondents rate their responses on a 4-point Likert-type scale. The four response choices are: (1) almost never, (2) sometimes, (3) often, and (4) almost always. Values

of item 1 are reversed. The TAI has two subscales that assess worry and emotionality as major components of test anxiety. Each subscale consists of eight items with the remaining four items not ordinarily included in either subscale. The eight items that form the TAI Worry subscale (TAI-W) are: 3, 4, 5, 6, 7, 14, 17, and 20. The eight items that constitute the TAI Emotionality subscale (TAI-E) are: 2, 8, 9, 10, 11, 15, 16, and 18. The TAI yields a total score based on all twenty items, a score for Worry based on the subset of eight items and a score for Emotionality based on the other eight-item subscale.

Inclusion criteria: All medical students above 18 years of age, of both gender, appearing for their university theory exams (external exams) and giving written informed consent to participate in the study, were included in the study.

Ethical issue: Written informed consent was taken from the medical students who agreed to participate in the study.

Statistical methods used: Student t-test and chi-square test was applied for uni-variate quantitative and qualitative data respectively. One way ANOVA (Analysis of Variance) was applied to find out difference between means of more than two groups. Difference would be said to be significant when p-value <0.05. Data was analyzed using IBM SPSS Statistics version 22 (evaluation copy).[12]

RESULTS

A total of 150 medical students appearing for their university exams were interviewed for assessing the exam anxiety among them. The mean (SD) age of the students was 20.6 (+ 0.49) years. All the medical students belonged to the upper socio-economic class (class I) of Modified Prasad's classification. The socio-demographic profiles of the students have been elucidated in Table 1. As shown in table 1, 52.7% medical students were female; 74% were living with their family; 75.3% students were studying in the regular batch and 98.7% student's mothers were literate. Among the different batches included in the study, 56% students were studying in 3rd year MBBS part 1, 34.7% students were studying in 2nd year MBBS and 9.3% were studying in 1st year MBBS. Out of 150 medical students, 82.7% completed their higher secondary education in Gujarati, 14% in English and 3.3% in Hindi medium. Among the 150 medical students, 50% said that they were facing parental pressure during exams; 44% felt that the course in medical studies was extensive and 53.3% felt that the duration of the examinations was long.

Table 1: Socio-demographic profile of medical students and factors likely to aggravate anxiety

Variable	Frequency (n=150) (%)
Gender	
Male	71 (47.3)
Female	79 (52.7)
Locality	
Living in hostel	39 (26)
Living with family	111 (74)
Year of study	
1st year MBBS	14 (9.3)
2nd year MBBS	52 (34.7)
3rd year MBBS part 1	84 (56)
Batch	
Repeater	37 (24.7)
Regular	113 (75.3)
Medium of study in higher secondary education	
English	21 (14)
Gujarati	124 (82.7)
Hindi	5 (3.3)
Literacy status of mother	
Illiterate	2 (1.3)
Literate	148 (98.7)
Parental pressure	
Yes	75 (50)
No	75 (50)
Extensive course	
Yes	66 (44)
No	84 (56)
Long Duration of Exam	
Yes	80 (53.3)
No	70 (46.7)

The detailed individual item scores of Test Anxiety Inventory among the medical students have been exemplified in Table 2. It shows that out of the 150 medical students, only 54% sometimes felt confident and relaxed while taking a test; 48% sometimes got so nervous to forget facts that they know best; 42% sometimes felt very confused and 41.3% sometimes felt their heart beating very fast. Among the 150 medical students, 40.7% never felt so tense to get an upset stomach; 39.3% never found themselves thinking that they will never get through college and 38.7% never felt that after completing their exams they can't stop worrying about it. The feeling of getting upset and uneasy was often felt by 32.5% medical students; 32% often reported interference while taking a test by thinking about their grades in a course and 26% often felt very uneasy just before taking an exam. Out of 150 medical students, 22% always froze up on taking an exam; 15.3% always wished that exams would not have bothered them so much and 14.7% always felt that their concentration in the examination was interfered by thoughts of performing poorly in the exam.

Table 3 elicits the frequency and percentages of the 20-item Test Anxiety Inventory scores. As shown in table 3, the mean score of TAI-worry was 16.95 (+ 3.39). The mean score of TAI-emotionality was 17.04 (+ 2.901) and that of TAI-total was 41.99 (+5.336).

Table 2: Frequency (%) of the individual 20-item score of TAI (each row n=150)

Symptoms	Almost Never	Sometimes	Often	Almost Always
I feel confident and relaxed while taking test	52 (34.7)	81 (54)	11 (7.3)	6 (4)
While taking test, I have uneasy and upset feeling	42 (28)	57 (38)	49 (32.5)	2 (1.3)
Thinking about my grades in a course interferes my work on test	55 (36.7)	35 (23.3)	48 (32)	12 (8)
I freeze up on important exam	46 (30.7)	45 (30)	26 (17.3)	33 (22)
During exams I find myself thinking about whether I will ever get through college	59 (39.3)	46 (30.7)	25 (16.7)	20 (13.3)
The harder I work at taking a time, the more confused I get	50 (33.3)	42 (28)	37 (24.7)	21 (14)
Thoughts of doing poorly interfere with my concentration on test	52 (34.7)	47 (31.3)	29 (19.3)	22 (14.7)
I fell very confused when taking an important test	42 (28)	63 (42)	30 (20)	15 (10)
Even when I am well prepared for a test, I fell very nervous about it	41 (27.3)	53 (35.3)	35 (23.3)	21 (14)
I start feeling very uneasy just before getting test paper back	49 (32.7)	40 (26.7)	39 (26)	22 (14.7)
During test I fell very tense	43 (28.7)	57 (38)	36 (24)	14 (9.3)
I wish examination did not bother me so much	45 (30.3)	47 (41.3)	35 (23.3)	23 (15.3)
During important test, I am so tense that my stomach get in upset	61 (40.7)	43 (28.7)	33 (22)	13 (8.7)
I seem to defeat myself while working an important tests	55 (36.7)	45 (30)	35 (23.3)	15 (10)
I fell very panicky when I take an important tests	49 (32.7)	55 (36.7)	36 (24)	10 (6.7)
I worry a great deal before taking an important examinations	53 (35.3)	52 (34.7)	25 (16.7)	20 (13.3)
During tests, I found myself thinking about the consequences of failing	48 (32)	55 (36.7)	31 (20.7)	16 (10.7)
I felt my heart beating very fast during the time of my important examinations	42 (28)	62 (41.3)	33 (22)	13 (8.7)
After completing my exam, I try to stop worrying about it but I can't	58 (38.7)	59 (39.3)	14 (9.3)	19 (12.7)
During examinations I get so nervous that I forgot facts that I really know and prepared best	48 (32)	72 (48)	13 (8.7)	19 (12.7)

Table 3: Minimum, maximum, mean and standard deviation of Test Anxiety Inventory scores (TAI-W, TAI-E and TAI-total)

Test Anxiety Inventory	Mini	Max	Mean	SD
TAI-Worry	10	27	16.95	3.390
TAI-Emotionality	11	25	17.04	2.901
TAI-total	31	58	41.99	5.336

Max=Maximum; Min=Minimum; SD=Standard Devition

As demonstrated in table 4, the female medical students were associated with mean TAI-emotionality scores of 17.54 (+3.25). By comparison, the male medical students were associated with a numerically smaller mean TAI-emotionality scores of 16.48 (+4.01). To test the hypothesis that the female medical students were associated with statistically significantly different mean TAI-emotionality scores, an independent samples t-test was performed. The TAI distributions were sufficiently normal for the purposes of conducting a t-test (i.e., skew $< |2.0|$ and kurtosis $< |9.0|$).[13] Additionally, the assumption of homogeneity of variances was tested and was not satisfied via Levene's F test, so Welch's t-test was used. The independent samples t-test was associated with a statistically significant effect, t(141.79)=-2.31, p=0.022. Thus, the female medical students were associated with a statistically significantly larger mean TAI-emotionality scores than the male medical students.

Similarly, the TAI-total scores were also significantly higher in female medical students than the male medical students. Those students who were living in hostel had higher mean TAI-emotionality scores than those living with their family. Also, the independent sample t-test between TAI-worry, TAI-emotionality and TAI-total did not have a statistically significant difference with respect to regular/repeater batch, parental pressure, extent of course of study and duration of exams.

Table 4: Mean, standard deviation and unpaired t-test between different variables and TAI

Scores	Mean Score ± SD	Equality of variances@		t-test for Equality of Means			
		F	Sig.	t	df	p-value	Mean Difference
TAI-emotionality							
Male (n=71)	16.48 ± 2.35	4.193	.042*	-2.32	141.8	0.022	-1.065
Female (n=79)	17.54 ± 3.25						
TAI-total							
Male (n=71)	40.99 ± 4.02	10.92	.001*	-2.25	135.26	0.026	-2.254
Female (n=79)	42.89 ± 6.18						
TAI-emotionality							
Living with family (n=111)	16.73 ± 2.73	0.515	.474†	2.071	58.4	0.043	1.193
Living in hostel (n=39)	17.92 ± 3.21						

SD = Standard Deviation; *Equality of variances NOT assumed as Levene's test p-value <0.05; †Equality of variances assumed as Levene's test p-value >0.05; @ Levene's test for equality of variances

Table 5: One-way ANOVA between TAI-total and year of study (n=150)

Variable	N	TAI-total (Mean ± SD)	SE	95% CI for Mean	Minimum	Maximum	ANOVA P value
All student	150	41.99 ± 5.336	0.436	41.13-42.85	31	58	
Year of study							
1st year MBBS	14	42.14 ± 3.159	0.844	40.32-43.97	37	49	0.873#
2nd year MBBS	52	41.67 ± 5.715	0.792	40.08-43.26	31	58	
3rd year MBBS part 1	84	42.15 ± 5.421	0.591	40.98-43.33	33	58	
Medium of study							
English	21	41.90 ± 3.948	0.862	40.11-43.70	34	48	0.965@
Gujarati	124	42.02 ± 5.630	0.506	41.02-43.03	31	58	
Hindi	5	41.40 ± 2.702	1.208	38.05-44.75	39	46	

SD=Standard Deviation; SE=Standard Error; CI=Confidence interval; #Test of Homogeneity of Variances - Levene's Statistic = 2.687 and P value =0.071 (Equality of variances assumed as Levene's test p-value >0.05), Test of significance ANOVA F value = 0.136; @Test of Homogeneity of Variances - Levene's Statistic = 3.0487 and P value =0.0504 (Equality of variances assumed as Levene's test p-value >0.05), Test of significance ANOVA F value = 0.35

The descriptive statistics associated with TAI-total across the three years of MBBS students are reported in Table 5. In order to test the hypothesis that the three years of MBBS students (1st year, 2nd year and 3rd year) had different levels of test anxiety, a between-groups ANOVA was performed.

Prior to conducting the ANOVA, the assumption of normality was evaluated and determined to be satisfied. The independent between-groups ANOVA yielded a statistically insignificant effect, F(2,147)=0.136, p=0.873. Thus, there was no associ-

ation between TAI-total scores and the year of study of MBBS students.

The descriptive statistics associated with TAI-total across the three groups of medium of study are also reported in Table 5. In order to test the hypothesis that the three groups of medium of study of MBBS students (English, Hindi and Gujarati) had different levels of test anxiety, a between-group ANOVA was performed. Prior to conducting the ANOVA, the assumption of normality was evaluated and determined to be satisfied. The independent between-groups ANOVA yielded a statistically insignificant effect, $F(2,147)=0.35$, $p=0.965$. Thus, there was no association between TAI-total scores and the medium of study in higher secondary. The assumption of homogeneity of variances was tested and satisfied based on Levene's F test in both the ANOVA test.

DISCUSSION

The present research focused on the levels of exam anxiety among medical students of a tertiary care hospital in Gujarat. This research supports other studies conducted on medical students on the finding that majority suffer from some level of anxiety.[14] The present study postulated that female medical students were more likely to experience exam anxiety than the male medical students. This fact was supported by other researchers.[15,16,17,18] Various psychiatric studies have proven that female are more prone to anxiety, depression and other psychiatric diseases.[19] The current research also supplements this concept. The female medical students had higher emotionality effect of anxiety than the male medical students, complementing the fact that the fairer sex are more emotional. Moral support of the family members also seems to play a role in exam anxiety. The present study found that the medical students who were living in hostel tend to get more anxious during exams than those living at home.

Pashwa B et al. (2008) highlighted that 55% of the medical students felt their heart pounding during exams and had a fear of the worst happening, while 38% felt nervous before exams.[15] The current study also reported 48% medical students getting so nervous to forget what they have learned and 41.3% felt their heart beating very fast during exams. This study also highlighted that 44% medical students believed that they had to go through an extensive course and 53.3% believed that they had long duration of exams. The research conducted in Karachi[20] also reported 90.8% students felt that they had an extensive course and 77.5% felt that they had a long duration of exams. Although, the present research did not find any association be-

tween anxiety levels of medical students either with an extensive course or with long duration of exams, whereas the research by Hashmat S et al. (2008) found these as the major factors contributing to exam anxiety among them.[20] The probable reason for this discrepancy can be the different exam patterns being followed in these two countries. The present research also postulated that exam anxiety did not have significant difference with respect to regular/repeater batch, parental pressure, professional year of study in MBBS and medium of study in higher secondary school.

CONCLUSIONS

We conclude from the study that the total anxiety scores were significantly higher among female medical students. The emotional effect of exam anxiety was significantly higher among the female medical students than the males and among the students living at hostel than those living with their families.

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