

Prevalence and Determinants of Test Anxiety among Undergraduate Medical Students in North Karnataka: A Cross-Sectional Study

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ABSTRACT

Background: Test anxiety is a common psychological concern among medical students and can adversely affect academic performance, emotional well-being, and professional development. Medical education is often associated with high academic expectations and frequent assessments, predisposing students to varying levels of anxiety. This study aimed to determine the prevalence of test anxiety and identify its associated determinants among undergraduate medical students in North Karnataka.

Methodology: A cross-sectional study was conducted among 357 undergraduate medical students of a medical college in North Karnataka using convenience sampling. Data were collected using a semi-structured questionnaire comprising socio-demographic details, academic factors, psychological variables, and the standardized Nist and Diehl Test Anxiety Scale. Statistical analysis was performed using SPSS version 21. Descriptive statistics, Chi-square test, independent t-test, and ANOVA were used to assess associations, with $p < 0.05$ considered statistically significant.

Results: The mean age of participants was 20.94 ± 1.35 years, and 76.8% were males. Overall, 67% of students exhibited test anxiety, of whom 62% had healthy levels and 5% had unhealthy levels of anxiety. The mean test anxiety score was 22.53 ± 7.36 . Higher anxiety levels were significantly associated with panic symptoms ($p = 0.035$), depression ($p = 0.027$), multiple-choice questions ($p = 0.023$), essay questions ($p = 0.001$), viva voce ($p = 0.001$), and practical examinations ($p < 0.001$). No statistically significant association was observed with gender, residence, family background, or medium of schooling.

Conclusion: Test anxiety is highly prevalent among undergraduate medical students and is significantly influenced by psychological factors and examination patterns. Early identification, counseling services, and evidence-based interventions such as cognitive behavioral therapy and mindfulness programs may help reduce anxiety and improve academic performance among medical students.

Keywords: Test anxiety, Medical students, Prevalence, Determinants, Cross-sectional study, North Karnataka

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INTRODUCTION

Throughout history, anxiety has been a part of people's lives. Although modernization has brought advantages to lead a peaceful life, it has also increased anxiety. A test is a way of discovering what someone knows or can do through questions or practical activities ⁽¹⁾. Anxiety is generally defined as fear and dread of one's performance and future outcomes. Test anxiety is a prevalent and impairing form of performance anxiety characterized by excessive worry, physiological arousal, and cognitive interference that can adversely affect concentration and academic achievement ⁽²⁾. It is also known as anticipatory, situational, or evaluation anxiety ⁽³⁾. Test anxiety results from interactions between an individual's dispositions, such as anxiety and fastidiousness, and situational stressors, such as high-stakes exams ⁽⁴⁾. Other than academic performance, a person with high test anxiety can experience sleep disturbances, burnout, and diminished self-efficacy ^(5,6). Meta analysis shows that one third of the students, especially medical and engineering students face moderate to severe test anxiety ⁽⁷⁾.

Anxiety, to some extent, is helpful in development as it causes one to be cautious and put in more work so that the path to success eases ⁽⁸⁾. However, increased anxiety has the opposite effect and limits the performance of a fully prepared individual. Based on previous studies, test anxiety has two distinct factors: emotionality and worry, also known as

cognitive test anxiety. Emotionality includes the physiological changes or symptoms seen during the test, while cognitive test anxiety causes increased worry and decreased confidence ⁽⁹⁾. Test anxiety causes negative emotions among students. Studies have shown that test anxiety decreases students' scores by approximately 12 percentiles ⁽¹⁰⁾. When faced with anxiety, the body activates a "fight or flight" response. Test anxiety symptoms vary from mild to severe. Students with mild anxiety perform better than those with high levels of test anxiety ⁽¹¹⁾. Some common physical symptoms include headache, upset stomach, sweating, racing thoughts, and blanking out. Long-term test anxiety negatively affects the social, emotional, and behavioral aspects of an individual's life ^(11, 12).

In recent years, evidence-based interventions have been developed to address this problem. Cognitive-behavioral therapy (CBT), mindfulness-based interventions, and metacognitive skills training have shown significant efficacy in reducing test anxiety and improving performance ^(13,14). Additionally, digital and group-based delivery models offer promising and scalable approaches within institutional wellness programs ⁽¹⁵⁾.

Despite these developments, gaps persist in the literature. Limited attention has been paid to cultural inclusivity and the integration of mental health support within curricula. Academic resilience must be built to reduce the global educational burden of

test anxiety. The present study aimed to estimate the level of test anxiety, its determinants, and its association with academic performance among medical students.

METHODOLOGY

A Cross-sectional survey was conducted among 357 medical students from a medical college in North Karnataka. The sample size was calculated using the formula for prevalence studies with $p=33\%$ ⁽¹⁶⁾, at a 95% confidence interval and precision of 5%. Data were collected by convenience sampling. The inclusion criteria were MBBS students aged > 18 years who signed the informed consent form. The tool for data collection was a semi-structured questionnaire that included the participants' socio-demographic profile and items on factors affecting test anxiety. It also included an item on the self-reported academic performance of the participants. The Test Anxiety Scale Questionnaire developed by Nist and Diehl (1990) was used to measure test anxiety. This scale comprises 10 items. The students had to score each item based on how often they experienced test anxiety. The scoring was on a five-point Likert scale, where 1 was (never), and 5 (always). Items were then summed for a total score, which ranged between 10 and 50, where scores between 10-19 indicated that students do not suffer from test anxiety, scores between 20-35 indicated that although students exhibit some of the characteristics of test anxiety, the level of stress and tension is healthy; and high scores over 35 showed that students experience unhealthy levels of anxiety⁽¹⁷⁾

Ethics committee approval was taken, and permission from the head of Institute was taken before starting data collection

Data were analyzed using SPSS software version 21. Descriptive statistical measures, such as percentages, means, and standard deviations, were used. Inferential statistical measures, such as Pearson's Chi-square, ANOVA, Independent t-tests, were used to determine the association between variables. Differences were considered statistically significant at $p<0.05$.

RESULTS

The study on test anxiety among 357 medical students is presented in the following tables. Table one shows the sociodemographic profile of the participants. Among the 357 students, 67.5% were aged < 21 years. In this study, the mean age was 20.94 years, 76.8% were males, and the majority were 2nd and 3rd year MBBS students. Off the student, 94% were hostilities, 81% were from a non-medical background and 25% were from non-English medium schools.

Table 1: Demographic profile of the medical students

Variable	Categories	Frequency (n=357)	Percent
Age	<21 years	241	67.5
	>21 years	116	32.5
	Mean age	20.94±1.35	
Gender	Male	274	76.8
	Female	83	23.2
Year of study	1 st	39	10.9
	2 nd	131	36.7
	3 rd	138	38.7
	4 th	49	13.7

Residence	Day scholar	19	5.3
	Hostel	338	94.7
Family background	Medical	67	18.8
	Non-medical	290	81.2
Medium of education in school	English	269	75.4
	Vernacular language	88	24.6

Table 2: Profile of factors affecting test anxiety

Variables	Categories	Frequency (n=357)	Percent
Type of learner	Regular study	153	42.9
	Last minute before exam	204	57.1
Mental health issues	Panic	82	23.0
	Anxiety	99	27.7
	Depression	66	18.5
Marks obtained in previous exams	<50%	14	3.9
	50-60%	76	21.3
	60-70	173	48.5
	>70	94	26.3
Anxious in following assessment	MCQ	101	28.3
	SAQ	79	22.1
	ESSAY	78	21.8
	VIVA	193	54.1
	Practical	121	33.9
	Case presentation	186	52.1
	Internal assessment	93	26.1

	University exam	200	56.0
Skipped exam due to test anxiety	Yes	79	22.1
	No	278	77.9
Getting anxious helps to score better in exam	Yes	107	30.0
	No	250	70.0
Study place during exam	Home	41	11.5
	Hostel	259	72.5
	Library	57	16.0

As seen in Table 1. Of the 357 students, 57% were last-minute learners. Anxiety and panic issues were observed in 28% and 23% of the students, respectively. The majority of the students obtained 60-70% marks in the previous exams. The majority of students felt anxious during viva, followed by case presentation and practical exams. Most students (56%) felt anxious during university exams, and 22% skipped exams due to anxiety. Only 30% of the students felt that being anxious could help them score better during exams. During exams, 72.5% of the students preferred to read in hostels, 16% in libraries, and 11% at home.

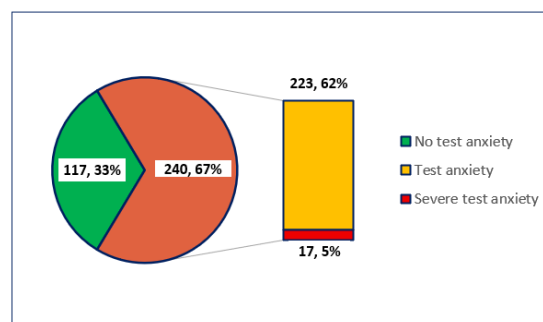


Figure 1. Test anxiety score of the students

Among 357 students, 67% of them were found to have some level of test anxiety, and only 5 % of them had unhealthy levels of test anxiety. Mean test anxiety score was found to be 22.53 ± 7.36

Table 3: Association between Test anxiety and Socio Demographic and Psychological factors

S l. No	Variables	Cate gories	No tes t an xie ty N (%)	Test anxi ety pres ent N (%)	Chi- sq ua re (χ^2)	p va lu e
1	Gend er	Male	92 (33 .6)	182 (66. 4)	0.3 45	0. 55 7
		Fem ale	25 (30 .1)	58 (69. 9)		
2	Resid ence	Host el	11 (32 .8)	227 (67. 2)	0.0 13	0. 90 9
		Day Scho lar	6 (31 .6)	13 (68. 4)		
3	Fami ly back grou nd	Medi cal	16 (23 .9)	51 (76. 1)	2.9 60	0. 08 5
		Non Medi cal	10 (34 .8)	189 (65. 2)		
4	Medi um of educ	Engl ish	87 (32 .3)	182 (67. 7)	0.0 92	0. 76 2

	ation in schoo l	Vern acula r	30 (34 .1)	58 (65. 9)		
6	Any Healt h probl em	Yes	16 (28 .6)	40 (71. 4)	0.5 32	0. 46 6
		No	10 1 (33 .6)	200 (66. 4)		
7	Panic	Yes	19 (23 .2)	63 (76. 8)	4.4 55	0. 03 5
		No	98 (35 .6)	177 (64. 4)		
8	Anxi ety	Yes	26 (26 .3)	73 (73. 7)	2.6 35	0. 10 5
		No	91 (35 .3)	167 (64. 7)		
9	Depr essio n	Yes	14 (21 .2)	52 (78. 8)	4.9 12	0. 02 7
		No	10 3 (35 .6)	188(64.4)		

Table 3 presents the association between test anxiety scores and various demographic and psychological factors for the study participants. Test anxiety was common in all groups. Test anxiety was found to be 66.4% among males and 69.9 among females, with no significant difference ($\chi^2=0.345$, $p=0.557$). Test anxiety was comparable between hostel residents (67.2%) and day scholars (68.4%) ($\chi^2=0.013$, $p=0.909$). Students from medical family backgrounds showed a

slightly higher proportion of test anxiety (76.1%) than those from non-medical backgrounds (65.2%), though this difference was not statistically significant ($\chi^2=2.960$, $p=0.085$). The medium of school education and the presence of any health problem also showed no significant association with test anxiety ($p>0.05$). However, test anxiety was significantly higher among students reporting panic symptoms (76.8% vs. 64.4%; $\chi^2=4.455$, $p=0.035$) and among those with depression (78.8% vs. 64.4%; $\chi^2=4.912$, $p=0.027$).

Table 4: Association between Levels of Test Anxiety and Academic Factors

S l. N o	Variables	Categories	No test anxiety N (%)	Test anxiety present N (%)	Chi-square (χ^2)	p value
1	Multiple choice questions	Yes	24 (23.8)	77 (76.2)	5.191	0.023
		No	93 (36.3)	163 (63.7)		
2	Short Answer Questions	Yes	20 (25.3)	59 (74.7)	2.560	0.110
		No	97 (34.9)	181 (65.1)		
3	Essay questions	Yes	13 (16.7)	65 (83.3)	11.752	0.001

		No	104 (37.3)	175 (62.7)		
4	Viva-Voce	Yes	49 (25.4)	144 (74.6)	10.398	0.001
		No	68 (41.5)	96 (58.5)		
5	Practical exam	Yes	23 (19.0)	98 (81.0)	15.741	<0.001
		No	94 (39.8)	142 (60.2)		
6	Case presentation	Yes	55 (29.6)	131 (70.4)	1.808	0.179
		No	62 (36.3)	109 (63.7)		
7	Marks in last exam	<50	1 (7.1)	13 (92.9)	4.595	0.204
		50-60	24 (31.6)	52 (68.4)		
		60-70	59 (34.1)	114 (65.9)		
		>70	33 (35.1)	61 (64.9)		

Test anxiety was significantly higher when answering multiple-choice questions (76.2% vs. 63.7%; $\chi^2=5.191$, $p=0.023$). A similar trend was observed for short answer questions (74.7% vs. 65.1%); however, the association was not statistically significant ($\chi^2=2.560$, $p=0.110$). Test anxiety was strongly associated with essay questions

(83.3% vs. 62.7%; $\chi^2=11.752$, $p=0.001$), viva voce (74.6% vs. 58.5%; $\chi^2=10.398$, $p=0.001$), and practical examinations (81.0% vs. 60.2%; $\chi^2=15.741$, $p<0.001$). The case presentation showed no significant association ($\chi^2=1.808$, $p=0.179$). Those who scored lower in the last internal assessment had higher anxiety scores than those who scored high; however, this finding was not statistically significant.

DISCUSSION

The current research estimated the prevalence and determinants of test anxiety among undergraduate medical students. Among the 357 students who participated in the study, the prevalence of test anxiety was 67%, of which 62% exhibited healthy test anxiety, and 5% had an unhealthy level of test anxiety. This finding aligns with the existing literature of a study done by Sreeram et al. in 2020, who reported that 108 (54%) of the students were in the range of moderately high to extremely high test anxiety.⁽¹⁸⁾ Another umbrella review on the prevalence of test anxiety reported that the overall prevalence of test anxiety among college and university students had a median prevalence of 32% and ranged from 7.40 to 55%.⁽¹⁹⁾ Vidya et al. (2024) reported that the prevalence of exam anxiety among medical students was approximately 77%.⁽²⁰⁾ In a similar study, Khalid et al. found that 65% of students experienced exam anxiety due to various reasons.⁽²¹⁾ A survey by SG Patil et al. reported the prevalence of high exam anxiety among Phases I-III as 37%, 28%, and 32%, respectively.⁽²²⁾

On comparison of test anxiety levels across the gender groups, the current study found that female students exhibited a higher level of mean test anxiety scores, but the difference was not statistically significant.

Khalid et al. 's survey stated that female students experienced more stress due to an extensive course load than male students.⁽²¹⁾ Stoeber et al. (2004) reported similar findings.⁽²³⁾ A study by Sharma et al. also reported a slightly higher prevalence in female medical students without a significant difference.⁽²⁴⁾ Memon et al. reported significantly higher test anxiety scores and prevalence of test anxiety among females.⁽²⁵⁾ In contrast, a survey by Patil et al. reported higher levels of test anxiety among male students. There were no gender differences in test anxiety prevalence, as reported by Zhang et al. In addition, students from medical family backgrounds reported slightly higher test anxiety than those from non-medical families, which may be attributed to increased expectations from parents.⁽¹³⁾ Pham T and Nguyen et al. reported family expectations as one of the determinants of stress among medical students in Vietnam.

On assessment of the education and learning factors, it was found that the students from English medium schools demonstrated higher levels of test anxiety than those who had schooling in vernacular language, likely due to a more competitive, performance-oriented academic milieu. This environment often exacerbates the "worry" component of anxiety, which has been specifically linked to increased task orientation and preparation as a coping mechanism. Furthermore, excessive course loads serve as an independent risk factor for high exam anxiety, as evidenced by findings where such loads significantly increased the odds of anxiety.

CONCLUSION

AND

RECOMMENDATIONS

The impact of this anxiety is pervasive across the entire learning-testing cycle.

Specifically, in the test preparation phase, high cognitive test anxiety is associated with inferior study skills and a higher perceived threat of upcoming tests. Research suggests that high-anxiety students often spend as much or more time studying as their low-anxiety peers, yet they often employ highly repetitive and less effective methods. Beyond preparation, the reciprocal relationship between achievement and emotion creates a persistent feedback loop. Longitudinal data indicate that negative emotions such as anxiety and hopelessness negatively predict subsequent achievement, while academic failure reinforces these negative emotional states. In the performance phase, students with high test anxiety are more likely to experience cognitive interference, such as task-irrelevant thinking or self-deprecating thoughts, which detracts from task concentration and recall. Furthermore, during the test reflection phase, high anxiety is linked to helplessness attributions, where students internalize failure as a lack of ability, deterring future effort. Addressing these complex dynamics requires early intervention because test anxiety can significantly disrupt academic careers. Evidence-based techniques, including biofeedback and cognitive behavioral therapy, have demonstrated promising results in the treatment of ADHD.

Conflicts of interest: none

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