# THE IMPACT OF STRESS ON ACADEMIC PERFORMANCE OF FIRST-YEAR MEDICAL STUDENTS

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## ABSTRACT

**Objective:** Anxiety is not uncommon in students pursuing professional and other courses. It makes us tired very early, as well as becoming the main cause of stress in young adults. Cognitive function may be affected during or after a stressful event. Our primary objective is to determine the prevalence of anxiety among medical students at Tirunelveli Medical College (TVMC), Tirunelveli.

**Methods:** A cross-sectional study was carried out among 150 1st-year medical students of TVMC who had spent more than 6 months in college. We assessed the students during the period without and during the period with examinations. Anthropometric variables of students included are age, gender, weight, height, and body mass index. The prevalence of anxiety was determined with a structured, validated questionnaire. We used the Hamilton Anxiety Scale (HAM-A), which has a cut-off score for various levels of anxiety. The students were subjected to the questionnaire both before and during the examination. All 150 students completed the questionnaire. Anthropometric parameters are age-matched.

**Results:** Data were analyzed using a paired "t" test. A high prevalence of anxiety ($p<0.001$) among medical students was found.

**Conclusion:** Female students were found to be more prone to anxiety than male students, and there was a significant association between the prevalence of anxiety and the examination period. This study finds a significant number of students with high anxiety scores indicating emotional distress, which may result in poor academic performance.

**Keywords:** Exam stress, Medical students, Anthropometric variables, Hamilton anxiety scale.

## INTRODUCTION

Stress-related illnesses have been reported by almost everyone nowadays. Anxiety is one of many causes of stress. Examinations had been mandatory in professional courses, especially the medical curriculum. It makes us tired very early, as well as becoming the main cause of stress in young adults. Cognitive function may be affected during or after a stressful event. Stressful feelings can alter the ability to think during examinations [1]. A medical student experiences academic stress while pursuing the course through several stages. Mild stress may be beneficial for cognitive tasks and performance, while persistently high stress may lead to anxiety and depression. Singh *et al.*, in their study, defined stress as "a physical or psychological stimulus that can produce mental or physiological reactions that may lead to illness." [2] Anxiety may manifest as physical effects like headaches, fatigue, palpitations, muscle weakness, dyspnea, and abdominal pain. Individual variability would be present in the emotional effects of anxiety. The emotional effects of anxiety may be restlessness, irritability, nightmares, insomnia, fearfulness, and a lack of concentration. Anxiety also has some cognitive symptoms like racing thoughts, going blank, difficulty concentrating, feelings of dread, and difficulty organizing thoughts [3]. Some studies have found little or no evidence of emotional distress among medical students [4]; others have reported significant pain. Gender may play a role in the manifestation of stress as well. The practical significance of higher levels of distress in females is unclear, given that women in general tend to report more psychological distress. The objective of this study is to determine the level of stress in students that enables us to administer and program remedial measures to improve mental and physical health as well as academic performance.

## METHODS

This study was carried out in the academic block of Tirunelveli Medical College (TVMC), Tirunelveli.

### Study population
150 medical students belong to 1 year.

### Study design
Cross-sectional study.

### Inclusion criteria
First-year medical students of TVMC who had spent not <6 months in college.

### Exclusion criteria
Any self-reported physical illness, students with a history of psychiatric disorders.

Ethical committee clearance was obtained from the institution for this study. The subjects were given proper information regarding the purpose of the study. Assessment of students was done during the specific period, with and without examination, separately.

### Anthropometric measurements
Anthropometric variables of students were measured. Body mass index (BMI) was calculated using the formula weight (kg)/height (m$^2$). A BMI from 18.5 to 22.9 is considered a normal range; a BMI from 23 to 24.9 is overweight, and a BMI above 25 is obese, as per revised World Health Organization criteria for Indians [5].

A structured, validated questionnaire was used to determine the prevalence of anxiety. The Hamilton Anxiety Scale (HAM-A) was used with a cut-off score for various levels of anxiety. The students were subjected to the questionnaire during the examination as well as the period well before the study period.

## RESULTS ANALYSIS

Data analysis was done using a paired "t" test. A high prevalence of anxiety (p<0.001) and depression (<0.001) among medical students was found (Figure 1 and Table 1). Female students have a greater tendency to develop anxiety than male students. A significant association has been found between the prevalence of anxiety and the examination period (Table 2).

## DISCUSSION

Results of our study showed that 45.99% of students had a mild degree of anxiety, 37.99% of students had a moderate degree of anxiety, and 15.99% of students had a severe degree of anxiety during examinations (Table 3). Quite similar results were observed in a descriptive study that was conducted on examination anxiety among 50 students of a recognized school in Chennai. The result showed that 40% of the students had moderate levels of examination anxiety, 36% had low levels of anxiety, and 24% had severe levels of examination anxiety. Girls were found to have more anxiety-related problems than boys, and there was a significant (**p<0.001) association between the examination period and anxiety (Table 3). The findings from our study correlate with the findings of Sohail [6] and Kumar *et al.* [7]. Our study shows that the time of the exam had an impact on the state of anxiety during the examination period. Medical professional curriculum is well known to be stressful, and varied levels of stress have been stated amongst medical students, as reported by Siddiqui *et al.* [8] and Lacy *et al.* [9]. Gupta *et al.* [10] found that their study was contradictory to ours as there were lower levels of anxiety during the examination period.

Academic achievement stands at the top compared to other factors in inducing stress in medical students. Several studies found no appreciating level of difference in anxiety among male and female medical students at the start of medical education; however, there was a greater rise in distress among female medical students through the course of training [11-13]. This finding suggests that the differences observed by gender in several studies may have other origins and warrant further investigation. However, few studies have reported differences in anxiety levels by gender [14]. Various studies have shown that constant mental pressure and untreated emotional problems are associated with various negative complications, including the development of adulthood anxiety [15], depression [16], and behavioral disorders [17,18].These studies suggest that the current educational process may have an inadvertent negative effect on students' mental health, with a high chance of depression, anxiety, and stress among medical students.

## CONCLUSION

In conclusion, our study shows a significant number of medical students with high anxiety scores, representing emotional distress that may result in reduced academic performance. The medical students should be given adequate awareness about the negative consequences of stress, and an efficient relaxation exercise as well as counseling services should be delivered to such stressed students to enhance their academic performance. The education system needs to develop better evaluation techniques that cause less distress among medical students and needs to develop and provide better support for deserving students for their well-being and the future generations to whom they are going to serve.

## AUTHORS' CONTRIBUTION

The corresponding author: a collection of study material, data collection, literature research, and submission to the journal; second investigator: manuscript writing, designing, and data analysis.
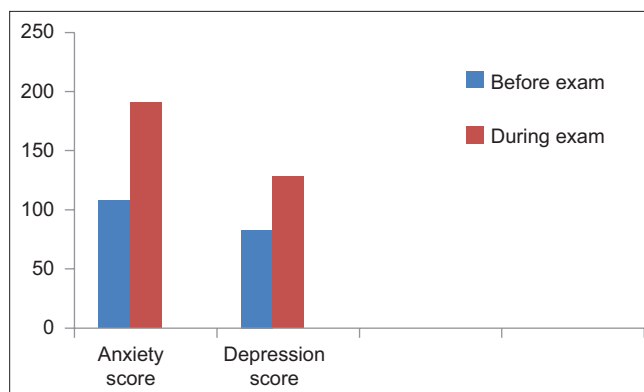


**Fig. 1: Comparison of anxiety and depression scores before and during exams**

**Table 1: Comparison of mean score of Hamilton anxiety rating scale of study participants before and during exams**

| Parameter | Mean score before | Mean score after | p-value (p<0.05) |
|---|---|---|---|
| Anxious mood | 0.72 | 1.273 | <0.0001* |
| Tension | 0.96 | 1.22 | 0.0103* |
| Fear | 0.52 | 0.85 | <0.0001* |
| Insomnia | 0.39 | 0.64 | <0.0001* |
| Intellectual | 0.59 | 0.78 | 0.0126* |
| Depressed mood | 0.553 | 0.853 | 0.0003* |
| Somatic (muscular) | 0.28 | 0.73 | <0.0001* |
| Somatic (sensory) | 0.23 | 0.65 | <0.0001* |
| CVS symptoms | 0.19 | 0.74 | <0.0001* |
| Respiratory symptoms | 0.2 | 0.7 | <0.0001* |
| GI symptoms | 0.25 | 0.82 | <0.0001* |
| Genitourinary symptoms | 0.14 | 0.69 | <0.0001* |
| Autonomic symptoms | 0.47 | 0.75 | 0.0002* |
| Behavior at interview | 0.84 | 1.19 | 0.0006* |

On the application of the "t" test all parameters showed statistical significance (*p<0.05)

**Table 2: Comparison of mean score of anxiety and depression of Hamilton Anxiety rating scale of participants before and during exams**

| Parameter | Mean score before the exam | The mean score during the exam | p-value | Statistical significance (p<0.05) |
|---|---|---|---|---|
| Anxious mood | 0.72 | 1.273 | 0.0001* | Significant |
| Depressed mood | 0.553 | 0.853 | 0.0003* | Significant |

**Table 3: Gender-based Hamilton anxiety rating score of study participants**

| Anxiety score | Before exams (n=150) | | During exams (n=150) | |
|---|---|---|---|---|
| | Boys (n=76%) | Girls (n=74%) | Boys (n=76%) | Girls (n=74%) |
| Mild | 74 (49.33) | 70 (46.66) | 40 (26.66) | 29 (19.33) |
| Mild to moderate | 2 (1.33) | 3 (2) | 26 (17.33) | 31 (20.66) |
| Moderate to severe | 0 | 1 (0.66) | 10 (6.66) | 14 (9.33) |
| Total | 76 (50.66) | 74 (49.33) | 76 (50.66) | 74 (49.33) |

Girls predominated over boys in mild, moderate, and severe anxiety both before and during the examination period

**CONFLICT OF INTEREST**

**AUTHORS FUNDING**

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