

Original Research Article

Stress, Anxiety, and Depression Among Medical Students: A 10-Year Comparison Using DASS-21

Urvashi Kapadia,¹ Kartik Patel,^{2*} Neeraj Mahajan¹

¹Department of Physiology, Smt NHL Municipal Medical College, Ahmedabad, Gujarat

²Department of Physiology, Bhagyoday Medical College, Kadi, Mehsana, Gujarat

***Correspondence:** Dr Kartik Patel (kartik_patel92@yahoo.co.in)

ABSTRACT

Background: Medical education is challenging which poses significant concern of mental health issues of medical students, especially first year medical students. Mental health assessment of first year MBBS students helps in management of mental health issues like stress, anxiety and depression.

Material and methods: The Depression Anxiety Stress Scales (DASS-21) is a widely used scale for assessing psychological distress. This study examines changes in stress, anxiety, and depression scores among 1st year medical students of 2015 (n = 130) and 2025 (n = 218) batches using raw subscale totals from self-reported data.

Result: Statistical analysis shows mean increases across all subscales: stress from 6.22 to 7.31, anxiety from 4.84 to 6.81, and depression from 4.36 to 5.58. Severity distributions shifted toward higher levels, particularly for anxiety (e.g., extremely severe from 6.2% to 28.4%). Independent samples t-tests confirmed statistically significant differences ($p < 0.01$ for all).

Conclusion: These findings match with broader trends in mental health deterioration after COVID-19 pandemic, highlighting the need for ongoing monitoring and interventions. Possible stressor can also be changed medical education curriculum in form of CBME.

Keywords: DASS-21, stress, anxiety, depression, 10-year comparison, mental health trends

INTRODUCTION

Mental health disorders, including stress, anxiety, and depression, represent a significant global burden, contributing to substantial economic and societal costs. The Depression Anxiety Stress Scales (DASS-21), a 21-item self-report measure, provides a reliable and valid assessment of these constructs, with subscales for depression (0-21), anxiety (0-21), and

stress (0-21). Raw scores are interpreted using established cutoffs: normal, mild, moderate, severe, and extremely severe.¹ The DASS-21 demonstrates strong internal consistency (Cronbach's $\alpha > 0.80$) and construct validity across diverse populations.² Pre-pandemic trends (2015) indicated rising but moderate prevalence of psychological distress, influenced by socioeconomic factors.³ The COVID-19 pandemic exacerbated these issues, with global anxiety and

depression prevalence increasing by 25% in 2020 alone.^{4,5} Post-pandemic data (2020-2025) suggest persistent elevations, particularly among young adults, with U.S. depression rates reaching 29% lifetime prevalence by 2023.⁶ This study compares DASS-21 scores from 2015 and 2025 to quantify these shifts among Indian medical students, addressing a gap in longitudinal, non-clinical data spanning the pandemic era.⁷ Hypotheses include significant increases in mean scores and severity proportions, consistent with broader trends.⁸ Recent changes in medical education curriculum in India i.e. introduction of large-scale changes via Competency Based Medical Education (CBME) also poses some challenges for the stake holders.^{13,14} It would be prudent to assess effects of such changes on mental health of students.

MATERIAL AND METHODS

2.1 Participants and Data Collection

Informed consent was taken. Data were collected from anonymous self-reports using the DASS-21 in 2015 (n=130, complete cases) and 2025 (n=218, complete cases). Participants were all 1st year medical students, batch 2015 and 2025, of Smt NHL Municipal Medical College, Ahmedabad, Gujarat, India.

Subscale totals were summed from 7 items per domain (0-3 Likert scale).

Severity levels followed standard thresholds:

Stress (Normal: 0-7; Mild: 8-9; Moderate: 10-12; Severe: 13-16; Extremely Severe: 17+);
Anxiety (Normal: 0-3; Mild: 4-5; Moderate: 6-7; Severe: 8-9; Extremely Severe: 10+);
Depression (Normal: 0-4; Mild: 5-6; Moderate: 7-10; Severe: 11-13; Extremely Severe: 14+).⁹

2.2 Statistical Analysis

Descriptive statistics (means, SDs, percentages) were computed. Independent samples t-tests (Welch's correction) assessed mean differences. Effect sizes (Cohen's d) were calculated. Analyses used Python (version3.12) with SciPy and NumPy libraries.

Significance was set at $\alpha = 0.05$. Assumptions of normality were approximated via large sample sizes.

RESULTS

Mean scores increased significantly across all subscales (Table1).

Stress: $t(346) = -3.03, p = 0.003, d = 0.35$;
Anxiety: $t(346) = -5.82, p < 0.001, d = 0.65$;
Depression: $t(346) = -3.42, p = 0.001, d = 0.38$.⁶

Table - 1: Descriptive Statistics for DASS-21 Subscales

Measure	Year	n	Mean (SD)	Severity Interpretation
Stress	2015	130	6.22 (3.58)	Normal
	2025	218	7.31 (2.61)	Normal
	Increased ($p = 0.003$)			
Anxiety	2015	130	4.84 (3.13)	Mild
	2025	218	6.81 (2.92)	Moderate
	Increased ($p < 0.001$)			
Depression	2015	130	4.36 (3.16)	Normal
	2025	218	5.58 (3.33)	Mild
	Increased ($p = 0.001$)			

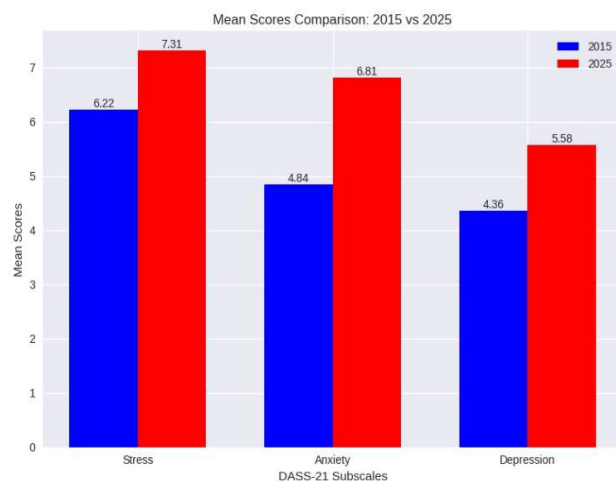


Figure - 1: Mean scores comparison for Stress, Anxiety and Depression

Severity distributions shifted toward elevated levels (Table2), with anxiety showing the most pronounced change (e.g., normal: 50.0% to 22.5%; extremely severe: 6.2% to 28.4%).¹⁰

Table - 2: Severity Levels Distributions (%)

Level	Stress		Anxiety		Depression	
	2015	2025	2015	2025	2015	2025
Normal	76.2	58.7	50.0	22.5	70.0	50.0
Mild	10.0	20.2	20.0	15.1	13.8	15.1
Moderate	8.5	16.1	16.9	20.6	11.5	20.6
Severe	3.8	4.1	6.9	13.3	3.1	10.6
Extremely Severe	1.5	0.9	6.2	28.4	1.5	3.7

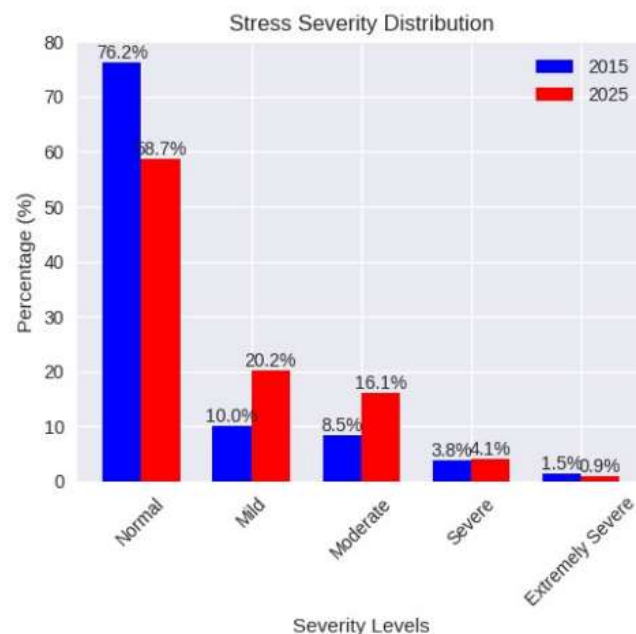


Figure - 2: Severity distribution: Stress

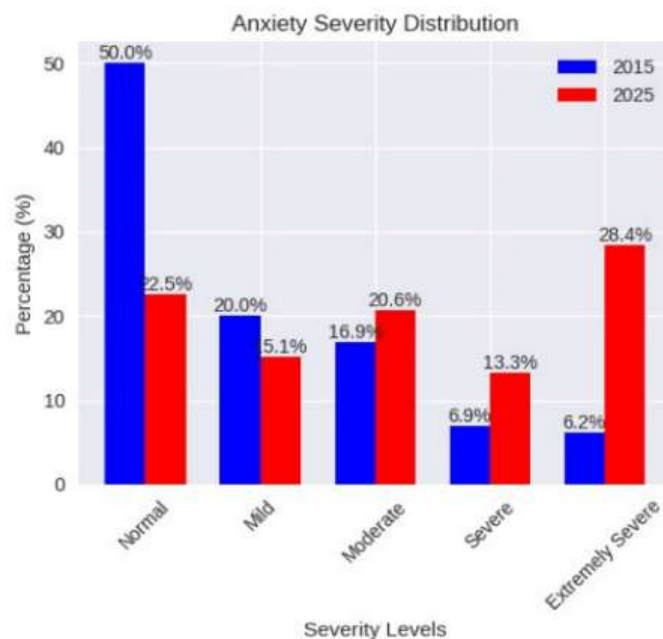


Figure - 3: Severity distribution: Anxiety

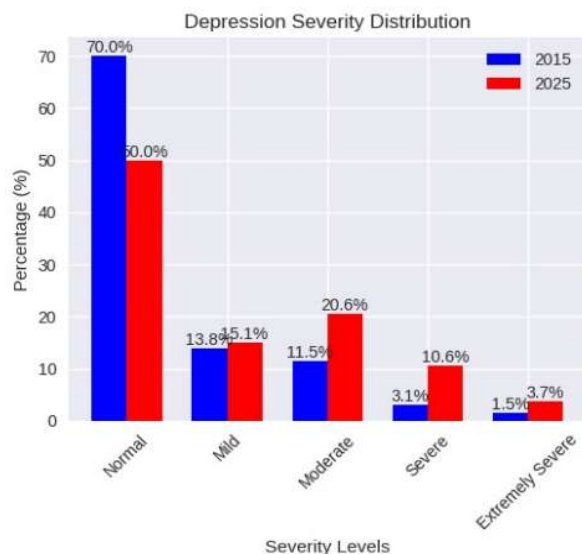


Figure - 4: Severity distribution: Depression

DISCUSSION

This study shows a statistically significant increase in stress, anxiety, and depression scores among first-year medical students over a 10-year period, with anxiety showing the most pronounced rise. The observed increases align with global trends, where depression prevalence rose from 7.3% in 2015 to 8.6% in 2019, accelerating to even higher level after that.³ Anxiety-related symptoms appear to have escalated disproportionately compared to stress and depression. This anxiety surges may reflect stressful medical studies or pandemic-induced uncertainty, with 25% higher prevalence in 2020.^{4,5} The DASS 21's reliability supports these findings ($\alpha = 0.94-0.96$).¹¹ The shift toward higher severity categories in anxiety further reinforces the need to examine early academic and psychosocial stressors in greater detail.

The potential role of systemic changes in medical education, particularly the implementation of Competency-Based Medical Education (CBME) in India, warrants consideration. While CBME aims to produce more competent and skill-oriented graduates, it also introduces continuous assessments, early clinical exposure, and increased performance monitoring. For first-year students, this may translate into additional academic and psychological burden,

especially when coupled with adaptation challenges inherent to the transition from school to medical college. These factors may partially explain the observed upward shift in psychological distress.

From a public health and educational perspective, these findings underscore the need for early identification and intervention. Routine screening using validated tools such as the DASS-21 could facilitate timely detection of at-risk students. Institutions should consider strengthening mentorship programs, providing accessible mental health support services, and incorporating stress management and resilience-building modules within the curriculum. Addressing these concerns proactively is essential to ensure both academic success and long-term well-being of future healthcare professionals.

Limitation includes self-report bias.¹⁰ Additionally, the study was conducted at a single institution, which may affect generalizability. Future research should adopt longitudinal designs and include a broader range of variables to better understand determinants of psychological distress.

These results underscore the DASS-21's utility in tracking mental health trajectories.¹²

CONCLUSIONS

DASS-21 scores indicate significant mental health deterioration from 2015 to 2025. Interventions targeting anxiety are urgently needed.

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