

ANXIETY IN MEDICAL EDUCATION: A GLOBAL REVIEW OF PREVALENCE AND CONTRIBUTING FACTORS AMONG MEDICAL STUDENTS

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Abstract: Anxiety is a prevalent concern among medical students, driven by academic pressure and emotional stress. This review examined nine international studies encompassing 4,508 students, revealing anxiety prevalence rates ranging from 28.48% to 81.63%. Variability was attributed to institutional, cultural, and methodological factors. Higher rates were observed in female students and those in preclinical years. Most studies emphasized the lack of psychological support systems. These findings highlight the urgent need for institutional interventions and standardized mental health assessments to support future healthcare professionals.

Keywords: anxiety, medical students, mental health, prevalence, academic stress, psychological support, cross-cultural study.

Introduction:-Anxiety is a prevalent mental health concern among medical students worldwide, often stemming from intense academic demands, long study hours, and emotional stress inherent in medical training. As these students are future healthcare providers, understanding and addressing their mental well-being is crucial for both academic success and long-term professional competency. Numerous studies have been conducted across different countries to assess the extent of anxiety among this population, revealing varying prevalence rates that reflect both cultural and institutional differences. Ahmed et al. (2009) conducted one of the earlier studies exploring anxiety among medical students and reported a relatively moderate prevalence. In contrast, a more recent and comprehensive investigation by Mayer et al. (2016) found a strikingly high rate of anxiety in their sample, suggesting a possible escalation of the issue over time or differences in the study population or methods used. Similarly, Latas et al. (2010) explored anxiety symptoms in students across different years of medical education and highlighted how academic progression might correlate with increased anxiety levels. A study conducted in Brazil (Prevalência study) showed that even in smaller cohorts, anxiety remains a significant concern, affecting a majority of students.

These findings underscore the need for cross-cultural comparisons and a more systematic approach to identifying the underlying causes of anxiety among medical students. The current review aims to consolidate data from multiple studies to better understand the scope of this issue, highlight potential risk factors, and encourage the implementation of institutional strategies to support student mental health.

By examining these studies side by side, this review contributes to the growing body of literature that calls for institutional and policy-level interventions to address anxiety and foster resilience in medical students.

Methodology:- This review utilized a structured approach guided by the PICO framework to evaluate the prevalence of anxiety among medical students. The population (P) included undergraduate medical students from various countries, such as Brazil, Serbia, Pakistan, Egypt, and Uzbekistan, with study sample sizes ranging from 50 to 1,350. Although no direct intervention (I) was implemented, the academic and institutional environments in which students were situated were considered natural contextual influences—factors such as curriculum pressure, exam schedules, and institutional support systems were treated as exposure conditions. No formal control groups were used; however, indirect comparisons (C) were made across studies to evaluate how anxiety levels differed between institutions and regions, offering insight into systemic academic and cultural variations. The primary outcome (O) measured was the prevalence of anxiety, typically assessed using validated instruments such as the DASS-21, GAD-7, or BAI. Anxiety rates were recalculated as percentages for consistency across studies. A total of 15 studies were initially identified, and after screening based on relevance, clarity of reporting, and data availability, 10 studies were included. Inclusion criteria required that studies report on undergraduate medical students, provide quantitative data on anxiety, and use recognized screening tools. Studies were excluded if they included mixed populations, lacked sufficient data, or used unvalidated measures. Data extraction was performed manually from each study, focusing on sample size, number of students with anxiety symptoms, and overall prevalence. This methodology enabled a comparative analysis of anxiety prevalence in diverse medical school settings, forming a basis for understanding global trends in medical student mental health.

Results :- Of the fifteen studies initially reviewed, ten met the inclusion criteria. These criteria included a clearly defined methodology, relevance of the sample population to the research question, and the presence of specific, measurable anxiety data. Collectively, these ten studies analyzed anxiety levels among 4,508 medical students from diverse regions, including South America, South Asia, the Middle East, Eastern Europe, and Central Asia. The findings paint a concerning picture: anxiety is not only prevalent but often severe among medical students.

The highest anxiety prevalence was reported in the multicentre study by Mayer et al. (2016) in Brazil, with 81.7% of students exhibiting symptoms of state anxiety and 85.6% of trait anxiety. Similarly, Fawzy & Hamed (2017) in Egypt found 73% of their 700 students reported anxiety, while the Kalash et al. study in Uzbekistan reported 71.43% state anxiety among international students. These extreme rates suggest that both institutional and individual factors significantly influence student well-being, particularly in environments with intense academic pressure or where support systems may be lacking.

Moderate levels were seen in Alvi et al. (2008) in Pakistan (47.7%) and the Brazilian Med School study (37.2%), while the Prevalência study recorded 35.5%, and Taneja et al. (2018) in India found a rate of 40.1%. Interestingly, Ahmed et al. (2009) in the UAE reported the lowest anxiety prevalence at 28.7%, possibly reflecting institutional differences, support systems, or cultural perceptions of mental health.

Across the board, studies indicated that female students, pre-clinical or early-year students, and those lacking sufficient sleep or emotional support were at higher risk for anxiety. Studies that utilized well-established diagnostic tools (e.g., BAI, STAI, DASS-21) provided more reliable measures, though cross-study comparisons remain challenging due to methodological variability.

Table Number.1-Summary of Depression and Anxiety Studies Among Medical Students.

Study	Country	Sample	Methodology	Instruments	Depression (%)	Anxiety (%)	Key Findings	Conclusion	Limitations
1. Ahmed et al. (2009)	UAE (Dubai)	165 students	Cross-sectional	BDI, BAI	28.6% (students)	28.7% (students)	2nd-year students highest depression/anxiety	Significant levels warrant further investigation	Single institution, cross-sectional
2. Brazilian Med School	Brazil	761 students	Cross-sectional	DASS-21	34.60%	37.20%	Higher rates in early semesters; females, religiosity	Mental health varies by semester, gender, religiosity	Single site
3. Mayer et al. (2016)	Brazil	1,350 students	Multicenter	BDI, STAI	41%	81.7% (state), 85.6% (trait)	Female sex, location, support significant	Better psychological support needed	Cross-sectional design
4. Latas et al. (2010)	Serbia	198 students	Cross-sectional	Test Anxiety Inventory	N/A	Moderate	Highest in 3rd year; females more affected	Test anxiety needs addressing	Focus only on test anxiety
5. Prevalência Study	Brazil	346 students	Cross-sectional	BDI, BAI	32.80%	35.50%	Female gender, parental pressure, future concerns	High prevalence; familial factors important	Cultural/social desirability bias

6.Kalash et al.	Uzbekistan	50 international	Mixed-methods	STAI, sleep survey	N/A	Moderate 71.43% (state), 61.22% (trait)	High anxiety → poor sleep → lower performance	Sleep and academic issues closely linked	Small sample, international only
7.Fawzy & Hamed (2017)	Egypt	700 students	Cross-sectional	DASS-21, PSQI	65%	73%	Female gender, poor sleep, preclinical years	High prevalence; stress linked to sleep and distress	One university only
8.Alvi et al. (2008)	Pakistan	279 students	Cross-sectional	BDI, BAI	35.10%	47.70%	Age, gender, test pressure, dissatisfaction	High rates of psych symptoms tied to education stress	Excludes first-years; self-report bias
9.Azad et al. (2017)	Pakistan	150 students	Cross-sectional	BDI, BAI	37.46% (mild), 14% (mod-sev)	19% (mod-severe)	Second-year spike; higher in final-year females	Timely support crucial	Limited sample size
10.Taneja et al. (2018)	India	187 students	Cross-sectional	DASS-21	32.00%	40.10%	Linked to body image, coping, family conflict	Urgent need for psychological support	Cross-sectional; self-report

Discussion:- The consistently high rates of anxiety observed across the reviewed studies highlight a significant global mental health concern within medical education. This issue transcends geographical, cultural, and socioeconomic boundaries, pointing instead to the structural and systemic stressors embedded within the medical training environment. These include intense academic competition, fear of failure, overwhelming workloads, early clinical exposure, and a lack of adequate coping mechanisms or psychological support. Notably, studies reporting the highest anxiety prevalence consistently identified several key

risk factors: female students experienced higher levels of anxiety, those in the early stages of their medical education were more vulnerable due to the abrupt transition and demands of the curriculum, poor sleep quality was both a symptom and a contributor to psychological distress, and the absence of institutional support—such as counseling services or mental health education—exacerbated the issue. In contrast, studies like Ahmed et al. (2009), which reported lower anxiety prevalence, may reflect protective institutional characteristics, including smaller class sizes, more personalized academic environments, or stronger student support systems, though the influence of cultural stigma on mental health disclosure must also be considered. Methodological differences across studies further complicate direct comparisons; while many employed validated tools such as the Beck Anxiety Inventory (BAI) or State-Trait Anxiety Inventory (STAI), others used general distress assessments or self-reported surveys that varied in reliability. Additionally, the predominance of cross-sectional designs and limited sample sizes restrict the generalizability and depth of findings. A particularly concerning gap is the lack of intervention-based research: although the presence of anxiety is well-documented, few studies implemented or evaluated strategies to mitigate it, underscoring a systemic failure to move from problem identification to solution implementation.

Conclusion:- This comprehensive review underscores the pervasive and global nature of anxiety among medical students, with reported prevalence ranging from 28.7% to over 85%. Such variability reflects not only methodological differences across studies but also the complex interaction of academic pressure, institutional shortcomings, cultural norms, and individual vulnerabilities. The findings reveal that while the rigor of medical education is inherent to professional training, the system often neglects to provide adequate mental health support. Consistently high anxiety rates across continents point to an urgent need for standardized mental health screening and intervention protocols within medical institutions. Key contributing factors—such as gender disparities, academic stage, sleep quality, and the presence or absence of support systems—must be central considerations in designing effective mental health strategies. In light of these findings, medical schools are urged to integrate structured mental health education into curricula, expand access to professional counseling services, and promote resilience through evidence-based approaches like mindfulness training, time management skills, and peer mentorship. Furthermore, future research must prioritize longitudinal and intervention-based studies to better understand trends and evaluate the effectiveness of support mechanisms. If unaddressed, the psychological distress experienced by medical students risks undermining not only their academic performance and personal well-being but also the quality and sustainability of future healthcare systems. Therefore, addressing anxiety in medical education is not merely a curricular enhancement—it is a public health imperative.

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