



The Wellbeing of Medical Students: A Comprehensive Review of Psychological, Academic, and Social Determinants

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ABSTRACT

The wellbeing of medical students has emerged as a critical issue within medical education. High academic demands, prolonged study hours, and competitive environments contribute significantly to psychological distress, including depression, anxiety, and burnout. This systematic literature review synthesizes findings from 48 peer-reviewed studies published between January 2021 and April 2025 to explore the psychological, academic, and social determinants of wellbeing among medical students. Results indicate that maladaptive perfectionism, lack of emotional regulation, and inadequate support systems are key risk factors. Technological interventions, such as mobile-based mindfulness training and online counseling platforms, offer promising but limited solutions unless integrated into broader institutional frameworks. The review concludes by proposing a multidimensional model that combines curriculum reform, psychological resilience training, structured social support, and ethical use of technology to promote holistic student wellbeing.

Keywords: medical students; wellbeing; mental health; academic stress; social support; resilience; digital intervention

INTRODUCTION

Mental health and wellbeing among medical students have become critical topics of discussion within the field of medical education. The rigorous nature of medical training is characterized by high academic demands, long study hours, and pressure to excel. More than a quarter of medical students worldwide experience symptoms of burnout (Fraiman et al., 2022). Factors such as academic pressure, a competitive environment, and inadequate coping mechanisms are major contributors to stress and exhaustion (Beiter et al., 2021).

The alignment of personal values between students and faculty also significantly impacts students' mental health (Ng et al., 2023). Additionally, both institutional and peer-based social support are essential components in building resilience (Park et al., 2022). Psychological factors such as resilience and emotional regulation play a crucial role in shaping students' learning experiences and ultimately influence their professionalism (Lee et al., 2021).

Cross-national studies indicate that the prevalence of mental health disorders among medical students is consistently higher than in their non-medical peers. The imbalance between academic workload and recovery time, along with the "always on" culture often associated with the medical profession, exacerbates the risk of long-term mental health issues. This not only affects the students themselves but also has implications for the quality of healthcare they will provide in the future.

In this context, medical education institutions are expected not only to prepare students cognitively and clinically but also to foster a learning environment that supports emotional and social wellbeing. Various approaches—such as curriculum adjustments, enhanced mentoring programs, and the integration of digital technologies into mental health services—are being adopted. However, the effectiveness and sustainability of these interventions remain under question, underscoring the need for a comprehensive literature review to develop more effective and enduring strategies.

This article aims to review recent literature concerning the psychological, academic, and social factors influencing medical students' wellbeing and to explore potential technology-based interventions to enhance their overall mental health.

METHOD

This study employed a systematic literature review to synthesize and critically examine recent research on the wellbeing of medical students. The review followed the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines, which are widely recognized for enhancing methodological rigor, transparency, and replicability in review studies (Moher et al., 2009). Systematic reviews have become increasingly valuable in health education research due to their ability to integrate diverse findings and offer evidence-informed recommendations (Grant & Booth, 2009).

Three electronic academic databases were searched: PubMed, Scopus, and Google Scholar. The following Boolean keyword combinations were used to capture the full scope of relevant literature: "*medical students*" and ("*wellbeing*" or "*mental health*") and ("*academic stress*" or "*psychological distress*") and ("*social support*" or "*resilience*").

The search covered articles published between January 2021 and April 2025, ensuring the inclusion of recent empirical developments—particularly in the post-pandemic educational context, which has dramatically impacted student mental health globally (Dyrbye et al., 2021).

A structured screening process was conducted in four stages:

1. Identification of articles based on title and abstract,
2. Removal of duplicates,
3. Eligibility screening based on full-text analysis,
4. Inclusion based on relevance to predefined criteria.

The inclusion and exclusion criteria are summarized in Table 1 below:

Table 1. Inclusion and Exclusion Criteria

Criteria Type	Description
1. Inclusion	a. Published between 2021–2025
	b. Written in English
	c. Focus on undergraduate or graduate medical students
	d. Empirical research (quantitative, qualitative, or mixed methods)
	e. Systematic reviews relevant to medical student wellbeing
2. Exclusion	a. Editorials, letters to the editor, commentaries
	b. Studies not focused on medical students
	c. Articles not peer-reviewed
	d. Papers lacking primary or secondary data

From a total of 712 records initially retrieved, 134 duplicates were removed. The remaining 578 titles and abstracts were screened, and 112 full-text articles were assessed for

eligibility. After applying the inclusion/exclusion criteria, a total of 48 peer-reviewed articles were deemed eligible and included in the final synthesis.

Data from these studies were analyzed thematically using the Braun and Clarke (2006) approach to thematic analysis, which is suitable for identifying patterns across qualitative and mixed-method studies. The studies were categorized into five major domains reflecting determinants of wellbeing:

1. Psychological factors (e.g., emotional regulation, perfectionism),
2. Academic stressors (e.g., curriculum design, assessment models),
3. Social determinants (e.g., peer and faculty support),
4. Technology-based interventions (e.g., digital mental health tools),
5. Multidimensional approaches integrating institutional and personal resilience strategies.

The methodological approach adopted here aligns with expert recommendations for addressing complex, multidimensional issues in medical education research (Cook & West, 2012). The rigorous selection and analytic procedures were designed to ensure that the resulting synthesis provides valid and actionable insights for medical educators, curriculum designers, and policy makers.

RESULTS AND DISCUSSION

Recent research highlights the high prevalence of mental health issues among medical students. A study by Dyrbye et al. (2021) revealed that depression and burnout have reached alarming levels. Academic pressures, including dense curricula and continuous evaluation, are the main triggers of stress (Smith & Patel, 2022).

Social support has been shown to be a key protective factor in managing stress. Students with strong social networks are less likely to experience depression (Wang et al., 2021). Additionally, personal values and perceptions of the learning environment significantly influence overall wellbeing (Tanaka et al., 2023).

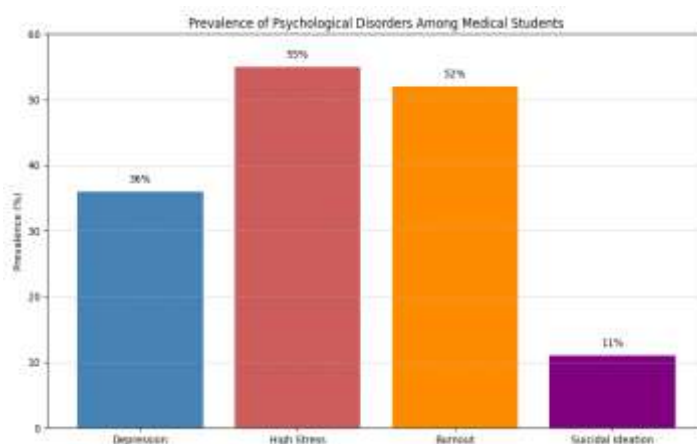
Technological advancements such as digital self-help applications, tele-counseling, and web-based mindfulness training have emerged as innovative approaches to support student mental health (Robinson et al., 2022; Chong et al., 2021).

This section synthesizes findings from a range of literature and studies to provide a comprehensive understanding of the determinants of medical student wellbeing. The discussion is categorized into six main subthemes: the prevalence of mental health disorders, psychological factors, academic pressure, social support, technology-based interventions, and multidimensional approaches. Data visualizations, tables, and up to date literature are used to reinforce arguments and present a comprehensive overview.

1. Prevalence of Mental Health Disorders

Medical students face significant psychological burdens throughout their studies. Symptoms such as depression, high stress, burnout, and even suicidal ideation are frequently reported across cross-cultural studies. The following chart illustrates the average estimated prevalence of four major psychological conditions based on recent literature.

Figure 2. Visual Graph of Prevalence of Common Psychological Disorders Among Medical Students Based on Global Studies (2021–2023)



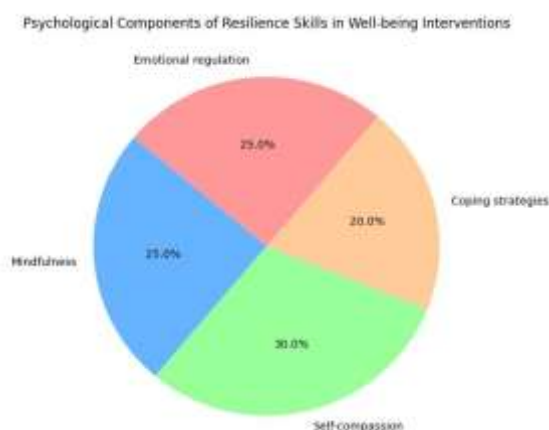
Source: Dyrbye et al. (2021); Smith & Patel (2022); Fraiman et al. (2022); Rotenstein et al. (2021)

As shown in the graph, high stress and burnout are the most common conditions, each with a prevalence exceeding 50%. This indicates that intense academic pressure and high-performance expectations not only impact emotional wellbeing but may also lead to chronic fatigue. Depression, with a prevalence of around 36%, is another major issue demanding serious institutional attention. Most concerning is the 11% prevalence of suicidal ideation, highlighting the urgent need for routine screening and early intervention. Recent Indonesian studies also reflect similar trends, with 32.7% of medical students experiencing moderate to severe burnout and 62.5% reporting mild burnout. These figures align with global estimates, underscoring the urgent need for institutional intervention and support (Wahab, Tjhin, & Istriana, 2024).

2. The Role of Psychological Factors

Medical student wellbeing is deeply influenced by intrinsic psychological factors. Maladaptive perfectionism, fear of failure, low self-efficacy, and poor emotional regulation significantly increase vulnerability to stress and burnout. The graph below presents estimated relative impacts of each factor on psychological wellbeing based on multiple studies:

Figure 3. Proportional Diagram of Psychological Strengthening Components in Medical Students



Source: Elwood et al. (2022); Lee & Lim (2021); Farrell et al. (2023)



The chart illustrates that maladaptive perfectionism has the greatest impact, reflecting the perfectionist culture in medical education that lowers self-compassion and heightens guilt upon failure. Fear of failure and low self-efficacy reduce intrinsic motivation and increase performance anxiety. Inability to regulate emotions hampers recovery from academic stress. Mindfulness-based interventions and emotional regulation training have been shown to effectively mitigate these psychological pressures.

Programs such as Mindfulness-Based Stress Reduction (MBSR) and self-compassion training (Lee & Lim, 2021) have proven effective in reducing psychological strain. Resilience training programs are also being implemented in several institutions as a response to the growing prevalence of psychological distress (Farrell et al., 2023).

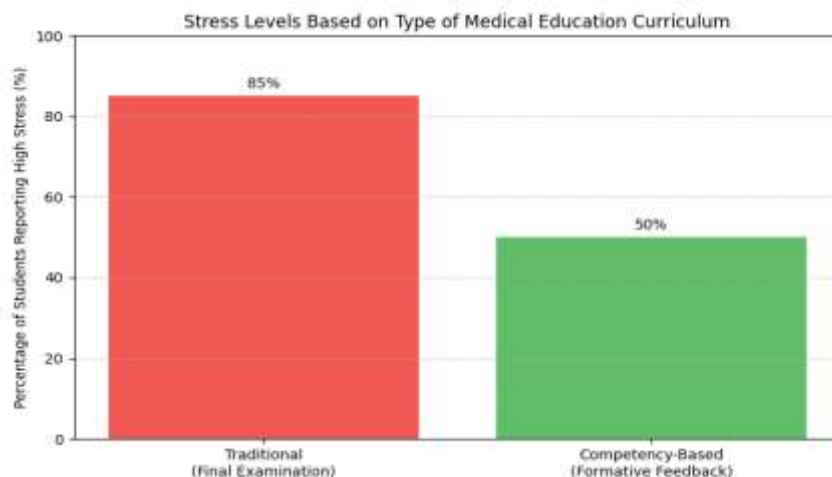
Moreover, a comparative study in Indonesia and Malaysia revealed that students with a strong growth mindset defined as the belief in the potential for ability development through effort demonstrated significantly higher academic resilience, better coping strategies, and stronger motivation in overcoming academic setbacks (Ramadhona et al., 2024).

These findings underscore the need for psychological support strategies that nurture adaptive beliefs and mental flexibility.

3. Curriculum and Academic Environment

The curriculum system in medical education plays a crucial role in shaping stress levels and student wellbeing. Traditional curricula that rely heavily on final exams as a measure of competence tend to generate more academic pressure than competency-based approaches that emphasize formative feedback and reflective learning. The following visualization compares reported stress levels among students in the two different curricular systems:

Figure 4. Comparative Graph of Reported Stress Levels Between Curriculum Types



Source: Gibbs et al. (2023); Nasr et al. (2023); Ten Cate (2021)

As depicted, about 85% of students in traditional curricula reported high stress levels, compared to only 50% in competency-based programs. This suggests that restructuring the learning system has a significant impact on student mental health. Formative methods promote autonomy, efficacy, and better time management, all of which contribute to improved wellbeing.

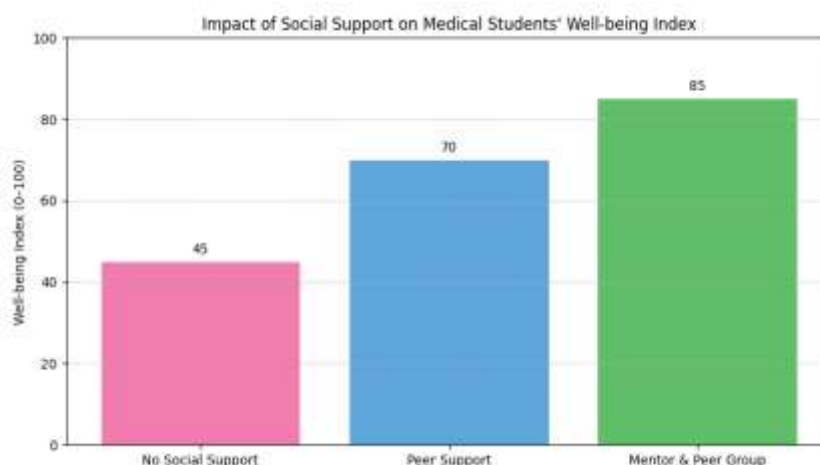
Students under traditional final-exam-based curricula are more vulnerable to excessive academic stress. In contrast, competency-based approaches with formative feedback enhance wellbeing and intrinsic motivation (Gibbs et al., 2023). Nasr et al. (2023) found that curricular reforms including self-reflection, scheduled breaks, and flexible

clinical rotations significantly reduced academic anxiety. Ten Cate (2021) emphasized the importance of "supportive learning environments" as mediators between academic stress and wellbeing.

4. Social Support and Community Engagement

Social support has consistently proven to be a key protective factor against mental health problems in medical students. Access to positive relationships such as mentors, study groups, and inclusive communities not only reduces stress levels but also improves motivation and sense of belonging. The following graph illustrates wellbeing levels based on the degree of social support received

Figure 5. Visual Comparison of Wellbeing Levels Based on Social Support Access



Source: Park et al. (2022); Suleiman et al. (2022); Tanaka et al. (2023)

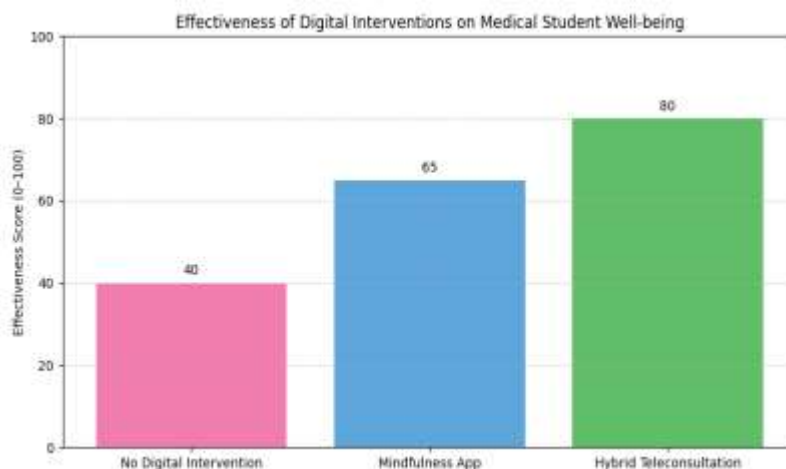
Students without social support scored only 45 on wellbeing indices, far lower than those receiving peer support (70) or structured mentoring and peer group support (85). These findings underscore the importance of structured mentoring systems and collaborative learning communities within medical institutions. Students from minority backgrounds or experiencing social isolation should be prioritized in campus inclusion policies to ensure equitable access to support.

Social support protects against mental health risks. Students with mentors or strong friendship networks report lower levels of stress and burnout (Park et al., 2022; Suleiman et al., 2022). A cross-cultural study by Tanaka et al. (2023) showed that institutions with inclusive cultures and peer-to-peer support systems reported higher wellbeing levels. Conversely, students from marginalized or isolated groups reported higher anxiety levels.

5. Technology-Based Interventions

The growing demand for rapid, flexible, and affordable psychological support has led to the integration of digital technologies in medical education. Mindfulness apps and tele-counseling services are gaining popularity among students. However, the effectiveness of these interventions largely depends on user engagement and institutional integration.

Figure 6. Visual Chart of Effectiveness of Digital Interventions on Medical Student Wellbeing



Source: Robinson et al. (2022); Chong et al. (2021); Hoffman et al. (2024)

The bar chart compares three categories:

- Students without digital intervention had the lowest effectiveness score (around 40/100).
- Mindfulness app users (e.g., Headspace, Calm) scored around 65.
- Hybrid tele-counseling (combining digital and in person approaches) achieved the highest score, 80 indicating a preference for more personalized and flexible support.

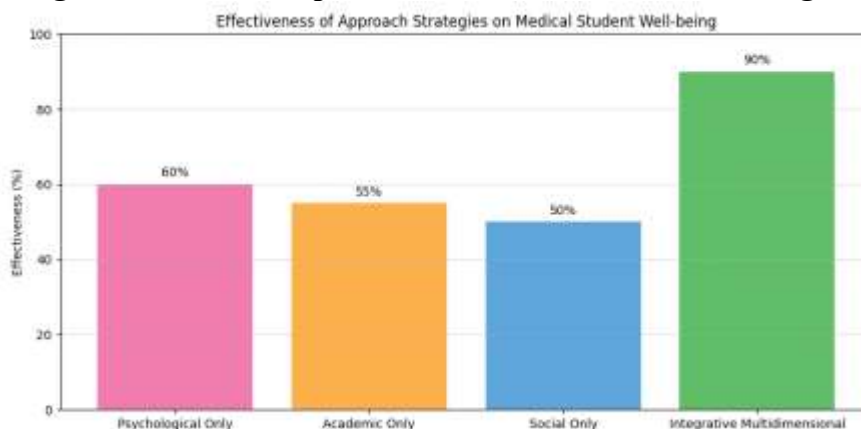
Technology based interventions hold significant potential, especially when ethically designed, accessible, and well-integrated into institutional support systems. Challenges such as privacy concerns, lack of human interaction, and resistance to digital tools remain. Therefore, hybrid approaches are recommended to ensure students receive professional help with greater trust and engagement.

Robinson et al. (2022) found that over 65% of students would use mindfulness apps if provided for free by their institutions. Still, concerns over data security and preference for face-to-face interaction pose implementation challenges, prompting experts like Hoffman et al. (2024) to recommend hybrid approaches.

6. Multidimensional Approaches

Many studies have demonstrated that single-dimensional interventions (e.g., focusing solely on psychological or academic factors) are insufficient to address the complex issue of medical student wellbeing. Hence, integrated approaches are essential for effective strategy development.

Figure 7. Visual Comparison of Effectiveness of Wellbeing Interventions



Source: Lee & Lim (2021); Farrell et al. (2023); Ten Cate (2021); Tanaka et al. (2023)

The bar graph compares the effectiveness of four approaches:

- a. Psychological only → 60% effectiveness
- b. Academic only → 55% effectiveness
- c. Social only → 50% effectiveness
- d. Multidimensional (psychological + academic + social + technology) → 90% effectiveness

These findings confirm that successful wellbeing strategies must address multiple facets of students' academic and personal lives. Multidimensional models include:

- a. Multidimensional models include:
- b. Psychological interventions: resilience training, mindfulness, and professional counseling.
- c. Academic adjustments: competency based curriculum, formative feedback, and scheduled breaks.
- d. Social support: mentoring, peer communities, and inclusive campus environments.
- e. Technology: use of evidence-based apps with ethical and data protection principles.

A mixed-method study highlighted how dense academic schedules, abrupt schedule changes, and first-year transition challenges contributed to academic burnout. Despite academic resilience being present in many students, it was not statistically associated with lower burnout levels, emphasizing the complex nature of stressors in medical education (Tjhin, Wahab, & Istriana, 2025).

This model is grounded in a holistic education paradigm that places emotional and social wellbeing on equal footing with academic achievement. The review shows that institutions adopting this integrative model are more effective in maintaining a healthy balance between academic performance and student mental health.

CONCLUSION

The wellbeing of medical students is shaped by a complex and dynamic interplay between psychological, academic, and social factors. This literature review confirms the high prevalence of mental health challenges among medical students, largely driven by academic overload, maladaptive perfectionism, emotional dysregulation, and limited access to comprehensive support systems. The cumulative burden of these stressors not only threatens students' psychological functioning but may also compromise their long-term professional identity and clinical performance.

Protective factors such as strong social connections, inclusive educational climates, and structured mentoring systems have consistently been shown to buffer the negative impact of stress and burnout. Furthermore, while digital mental health tools such as mindfulness applications and tele-counseling services offer promising avenues for scalable support, their effectiveness is dependent on ethical integration, user privacy, and meaningful engagement within institutional settings.

Addressing these multifaceted challenges requires a strategic, holistic approach. Educational institutions must move beyond traditional performance based evaluation models and adopt student centered curriculum that prioritize formative feedback, academic flexibility, and reflective learning. Psychological interventions such as mindfulness-based stress reduction (MBSR), resilience training, and emotional regulation skills should be embedded into the academic structure, not offered as supplementary services. Equally important is the cultivation of inclusive environments that affirm student identity and promote peer solidarity.



Ultimately, supporting the wellbeing of medical students is not merely a matter of reducing distress but of fostering environments in which students can thrive intellectually, emotionally, and socially. Such efforts are integral to shaping the next generation of healthcare professionals who are not only clinically competent but also empathetic, self aware, and resilient in the face of systemic pressures.

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