

The Impact of the COVID-19 Pandemic on Anxiety among Medical Students in Indonesia: A Literature Review

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Abstract
Background: The COVID-19 pandemic caused significant disruption to global medical education, triggering a sharp increase in anxiety levels among students. This phenomenon was particularly severe in Indonesia due to existing systemic challenges. This literature review aims to synthesize evidence regarding the prevalence of anxiety and to systematically categorize its causal factors among Indonesian medical students during the crisis.
Methods: The method used is a narrative literature review. Literature search was conducted on Google Scholar, PubMed, and Scopus databases for relevant research articles, reports, and reviews published between 2020 and 2024, using keywords such as "anxiety", "medical students", "COVID-19", and "Indonesia".
Results: The results indicate a very high prevalence of anxiety in Indonesia (often >60%), a rate that consistently exceeds global and regional averages. Causal factors were classified into two domains. External factors include changes in the education system, socioeconomic and digital divides, lack of institutional support, and learning loss in clinical skills. Internal factors include health-related fears, gender vulnerability, mental health literacy, academic burnout, and the selection of coping strategies.
Conclusion: Anxiety among Indonesian medical students is a complex, multifactorial issue. Building a more resilient medical education system requires a combination of supportive institutional policies and programs to strengthen individual resilience to effectively address mental health challenges.

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Keywords: Anxiety, COVID-19 pandemic, Medical students, Mental health, Online learning

Introduction

The COVID-19 pandemic caused unprecedented disruption to medical education worldwide, leading to a well-documented surge in psychological distress, particularly anxiety, among students [1]. In Indonesia, this phenomenon was particularly severe, with studies indicating that the prevalence of anxiety among medical students significantly exceeded global averages, often affecting the majority of the student population [2]. While numerous local studies have identified various stressors—ranging from academic concerns to health-related fears [3, 4]—a comprehensive synthesis is lacking. There is a notable gap in research that systematically categorizes these multifaceted factors into a coherent framework that distinguishes between external, systemic pressures and internal, individual vulnerabilities within the unique Indonesian context. Therefore, the purpose of this review is to fill this gap by synthesizing evidence on the prevalence of anxiety and proposing a systematic framework of its causal factors. This study aims to provide a holistic understanding of the issue to better inform targeted interventions

Materials and Methods

This study employed a narrative literature review methodology. A systematic literature search was conducted on several academic databases, including Google Scholar, PubMed, and Scopus. The search focused on articles published between January 2020 and June 2024 to cover the entire period of the COVID-19 pandemic and its aftermath. Search terms included combinations of "COVID-19", "anxiety", "mental health", "medical students", "Indonesia", "online learning", "burnout", and "learning loss". Inclusion criteria were primary research articles, systematic reviews, and meta-analyses that discussed the prevalence or contributing factors of anxiety among medical students in Indonesia. Articles not available in English or Indonesian, or those not focused on medical students, were excluded. The selected literature was then synthesized to identify major themes regarding the prevalence and the external and internal factors contributing to anxiety.

Results

The synthesis of the literature revealed a high prevalence of anxiety among Indonesian medical students and identified a complex interplay of causal factors, which were categorized into external and internal domains.

Prevalence of Anxiety

Anxiety among medical students during the COVID-19 pandemic was a global phenomenon. A systematic review and meta-analysis covering 77 studies from 36 countries found that the pooled prevalence of anxiety globally was 33.8% [1]. Regionally, a meta-analysis focusing on Southeast Asia reported a similar anxiety prevalence of 33% [5]. At the national level, data from Indonesia suggests a tendency for higher anxiety rates. A large study involving 729 medical students found that the prevalence of anxiety symptoms reached 65.2% [2]. This high figure indicates the presence of systemic challenges in the country. At the institutional level, various studies report alarming figures. A study at Sam Ratulangi University noted that 70.8% of respondents experienced moderate to high anxiety [6]. Similar figures were found at Nusa Cendana University (63.3%) [3], HKBP Nommensen University (61.4%) [7], Tarumanagara University (60%) [8], and Baiturrahmah University (58.3%) [9]. A study on clinical-year students reported a very high anxiety level of 86.6% [10].

Causal Factors of Anxiety

The anxiety experienced by medical students during the pandemic was influenced by a complex set of factors, which can be categorized as external (originating from the environment and systems) and internal (originating from within the individual).

External Factors

These factors stem from the environment, institutions, and systemic conditions beyond the direct control of the students, which significantly affected their psychological state.

- Changes in the Education System: The primary trigger for external stressors was the sudden and massive change in the education system. The universal shift from face-to-face learning to online modes forced students and institutions to adapt quickly without adequate preparation. This fundamental change created significant uncertainty regarding teaching methods, assessments, and academic interaction. The lack of standardized online protocols led to inconsistent lecture delivery, confusing exam formats, and a loss of structured peer-to-peer learning, which are hallmarks of traditional medical education. This systemic chaos, coupled with the lack of training in online learning technology for both students and faculty, became a fundamental source of academic anxiety [11].
- Socioeconomic Variables: Socioeconomic variables became the main filter determining students' level of preparedness. Students from lower socioeconomic backgrounds faced layered challenges. In addition to financial constraints, they often lacked a conducive learning environment at home, such as a quiet and private study space, which is crucial for concentration during online lectures [12]. Furthermore, the pandemic-induced economic crisis disproportionately affected low-income families. Students from these backgrounds not only struggled to afford basic learning necessities like devices and internet data but also experienced psychological pressure from family financial instability, such as parental job loss [13]. This financial stressor became an additional burden on top of heavy academic demands, ultimately contributing significantly to increased anxiety symptoms [14].
- Digital Divide: As a direct manifestation of socioeconomic variables, the digital divide played a significant role. This divide was multidimensional, encompassing unequal access to hardware, disparities in digital literacy, and unreliable internet connectivity. Firstly, inequality in device access meant that students with older or lower-specification devices struggled to run resource-intensive medical software or multitask during synchronous sessions, placing them at an immediate disadvantage [15]. Secondly, there were significant disparities in IT skills, often termed the "second-level digital divide." Not all students were equally adept at navigating the array of learning management systems, video conferencing tools, and digital assessment platforms, which led to technical frustration and a sense of falling behind academic peers [16, 17]. Thirdly, and perhaps most critically for a large archipelago like Indonesia, was the issue of unstable internet connections, particularly in rural and remote areas. The constant fear of disconnection during a crucial lecture or a high-stakes online examination was a major source of acute anxiety for many students [14].
- Institutional Support Systems: The institutional response to the crisis significantly affected students. Effective support, such as mindfulness training, was shown to reduce stress, indicating that students receiving structured mental health support had better psychological well-being [18]. Conversely, a lack of clear communication, unavailable or poorly advertised counseling services, and rigid academic policies that did not account for students' diverse pandemic-related challenges exacerbated anxiety. Inconsistent policies between faculties and limited financial resources for student aid further widened the support gap [19, 20]. This situation highlights the need for a standardized national framework for psychological crisis management in medical schools, moving beyond reactive, partial solutions like internet quota subsidies that were not uniformly applied [21, 22].

- Learning Loss: Academic loss became a significant contributor to anxiety. Learning loss, or the decline in knowledge due to educational disruption [23], was acutely felt in the hands-on field of medical education [24]. Specifically, clinical skills were severely disrupted. The inability to practice procedures like physical examinations or patient communication led to a profound fear of incompetence and a decline in professional confidence. This gap was worsened by inequitable access to compensatory learning tools; students with financial means could access high-quality simulation software, while others could not [25]. Consequently, many students felt unprepared for licensing exams and their future professional roles, creating significant anticipatory anxiety about their ability to be effective physicians.

Internal Factors

These factors originate from within the individual, encompassing personal characteristics, cognitive understanding, emotional responses, and actions taken to cope with pressure.

- Gender Differences in Anxiety: Studies in Indonesia consistently reported that female students exhibited higher levels of anxiety [8, 26]. This is attributed to a combination of biological factors (hormonal fluctuations and greater stress reactivity) [27], social roles (the "double burden" of academic and domestic responsibilities, which intensified during lockdowns) [28], and different coping mechanisms (a greater tendency toward rumination, or repetitively dwelling on problems) [29]. This multifaceted vulnerability underscores the need for gender-sensitive mental health interventions.
- Knowledge and Mental Health Literacy: Low mental health literacy was correlated with higher anxiety. Students who lacked an understanding of anxiety symptoms were more likely to catastrophize their experience, leading to a more severe psychological response. In contrast, those with higher literacy could better identify their symptoms and seek appropriate help, acting as a protective factor [30]. Furthermore, beyond mental health, accurate knowledge about COVID-19 itself was also proven effective in reducing anxiety, as it dispelled misinformation and provided a greater sense of control [31].
- Health-Related Fears: The fear of infection was a fundamental emotional response, with one study showing nearly half of students reporting anxiety related to COVID-19 exposure [32]. This fear was not uniform; it was significantly heightened for those with personal or family histories of comorbidities, as well as for those who experienced long COVID symptoms like chronic fatigue [33, 34]. The fear of being an asymptomatic carrier and transmitting the virus to vulnerable family members, particularly elders, was an immense psychological burden. This anxiety peaked during the Delta variant surge in mid-2021, which overwhelmed Indonesia's healthcare system and amplified fears of personal and familial harm [35].
- Academic Burnout: Burnout—a syndrome of emotional exhaustion, cynicism, and inefficacy [36]—increased significantly during the pandemic [37]. Emotional exhaustion was linked to the relentless pace of online classes and unstructured schedules [38]. Cynicism, or a detached and negative attitude toward one's studies, was fueled by the lack of meaningful interaction with peers and mentors, leading to feelings of isolation [39]. Lastly, inefficacy, the feeling of being incompetent, was directly compounded by learning loss. This created a destructive feedback loop where a perceived lack of skills fueled anxiety about the future, which in turn made it harder to engage and learn, further reinforcing feelings of incompetence [40].
- Coping Strategies: Coping strategies were the final determinant of well-being. Maladaptive strategies, like avoidance and self-blame, were shown to worsen anxiety symptoms by preventing problem resolution and increasing isolation [34, 41]. In contrast, adaptive strategies were highly protective. Problem-focused coping, such as creating structured study schedules and actively seeking information, reduced uncertainty and increased a sense of control. Emotion-focused coping, such as seeking social support from peers via online platforms and engaging in religious or spiritual practices like prayer, provided comfort and mitigated feelings of loneliness [41-43].

Discussion

The findings of this review confirm that the prevalence of anxiety among medical students in Indonesia during the COVID-19 pandemic was exceptionally high, far exceeding global and regional averages [1, 2, 5]. This suggests that while the pandemic was a universal stressor, its impact was amplified by pre-existing systemic vulnerabilities within the Indonesian educational and socioeconomic landscape, such as the well-documented digital divide [14].

The key contribution of this review is the systematic categorization of these stressors into external and internal domains. This framework reveals that student anxiety is not merely an individual psychological response but a complex interplay between the student and their environment. External factors created a foundation of inequality and uncertainty, disproportionately disadvantaging students from lower socioeconomic backgrounds [12, 13]. This highlights a critical failure point: when the educational system itself becomes a source of stress, student resilience is severely tested.

Internal factors modulated this response. The higher reported anxiety in female students, for instance, points to a need for gender-sensitive mental health support that acknowledges the unique biological and sociocultural pressures they face [24, 44].

The role of academic burnout, particularly the dimension of inefficacy, demonstrates a destructive feedback loop: learning loss creates a sense of incompetence, which in turn fuels anxiety and further hinders learning [39]. Conversely, the effectiveness of adaptive coping strategies underscores the importance of individual resilience and psychological flexibility [40].

This study has limitations. As a narrative review, it does not involve a quantitative meta-analysis, and there is a potential for selection bias in the included literature. However, by synthesizing a wide range of studies, it provides a holistic and contextualized understanding of the issue. Therefore, any effective intervention cannot be one-dimensional. A multilevel approach is necessary. At the institutional level, policies must focus on creating a supportive and equitable learning environment, including investing in hybrid learning infrastructure and robust digital support [45]. At the individual level, programs aimed at enhancing mental health literacy

and teaching adaptive coping skills are crucial for building student resilience [28, 40].

Conclusion

The COVID-19 pandemic exposed significant vulnerabilities in the Indonesian medical education system, leading to a severe mental health burden on its students. Anxiety emerged as a multifactorial issue driven by a combination of systemic pressures and individual responses. This review's novelty lies in its systematic framework, which can guide future research and the development of targeted, multilevel interventions. Addressing this crisis requires a dual strategy: institutions must build more resilient and supportive systems, while simultaneously equipping students with the internal resources to navigate future crises. This integrated approach is essential for safeguarding the well-being of the next generation of physicians.

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