

Michalina Makiela¹, Piotr Marcinowicz^{1,2}, Magdalena Więdoła¹, Agata Szulc¹

Mind matters: decoding mental health in medical students

Zdrowie psychiczne ma znaczenie: rozszyfrowanie stanu psychicznego studentów medycyny

¹ Psychiatric Clinic of the Faculty of Health Sciences, Warsaw Medical University; Unit II DE, Prof. Jan Mazurkiewicz Mazowieckie Specialist Health Centre, Pruszków, Poland

² Centre for Psychiatry and Psychotherapy KetamineClinic, Warsaw, Poland

Correspondence: Michalina Makiela, Warsaw Medical University, Żwirki i Wigury 61, 02-091 Warsaw, Poland, e-mail: michalinamakiela@gmail.com

¹ Klinika Psychiatryczna Wydziału Nauk o Zdrowiu Warszawskiego Uniwersytetu Medycznego; Oddział II DE, Mazowieckie Specjalistyczne Centrum Zdrowia im. prof. Jana Mazurkiewicza, Pruszków, Polska

² Centrum Psychiatrii i Psychoterapii KetamineClinic, Warszawa, Polska

Adres do korespondencji: Michalina Makiela, Warszawski Uniwersytet Medyczny, ul. Żwirki i Wigury 61, 02-091 Warszawa, Polska, e-mail: michalinamakiela@gmail.com

 <https://doi.org/10.15557/PiPK.2024.0020>

ORCID iDs

1. Michalina Makiela  <https://orcid.org/0009-0003-4465-8584>

2. Piotr Marcinowicz  <https://orcid.org/0000-0001-6660-8711>

3. Magdalena Więdoła  <https://orcid.org/0000-0001-8353-7820>

4. Agata Szulc  <https://orcid.org/0000-0003-0059-9861>

Abstract

This review synthesises current research on the prevalence and determinants of depressive and anxiety symptoms among medical students. It highlights significant mental health challenges faced by this group, emphasising the influence of various factors such as academic pressures, personality traits, and reluctance to seek professional help. The analysis also delves into the roles of gender and geographical variation, revealing how these factors contribute to differing rates of mental health issues among medical students globally. The findings reveal a concerning prevalence of depression and anxiety, with variation observed across different regions and genders, indicating the influence of cultural and societal norms on mental health. This review underscores the urgent need for enhanced mental health support and intervention strategies within medical education systems. The importance of incorporating psychological support programmes and mental health education into curricula is highlighted. By addressing these issues, there is a potential to significantly improve the well-being and academic success of medical students, ultimately contributing to their overall mental health and resilience in their future professional lives. The paper advocates for a multifaceted approach in tackling these challenges, suggesting that medical institutions should not only focus on academic excellence but also prioritise the mental health of their students, ensuring a more supportive and nurturing educational environment.

Keywords: mental health, anxiety, depression, medical students, professional help-seeking

Streszczenie

Niniejszy przegląd ma na celu podsumowanie aktualnych badań dotyczących rozpowszechnienia i determinant depresji oraz objawów lękowych wśród studentów medycyny. Podkreśla znaczące wyzwania zdrowia psychicznego, przed którymi stoi ta grupa, z naciskiem na wpływ różnych czynników, takich jak presje akademickie, cechy osobowości i niechęć do poszukiwania profesjonalnej pomocy. Analiza obejmuje również role płci i różnic geograficznych, ujawniając, jak czynniki te przyczyniają się do różnych wskaźników problemów zdrowia psychicznego wśród studentów medycyny na całym świecie. Wyniki ujawniają niepokojące rozpowszechnienie depresji i lęku, z obserwowanymi różnicami w różnych regionach i pomiędzy płciami, wskazując na wpływ norm kulturowych i społecznych na zdrowie psychiczne. Przegląd podkreśla pilną potrzebę wzmocnienia wsparcia zdrowia psychicznego i strategii interwencyjnych w systemach edukacji medycznej. Zwraca uwagę na konieczność włączenia programów wsparcia psychologicznego i edukacji w zakresie zdrowia psychicznego w programy nauczania. Poprzez rozwiązywanie tych problemów istnieje potencjał znaczącej poprawy dobrostanu i sukcesu akademickiego studentów medycyny, co ostatecznie przyczyni się do ich ogólnego zdrowia psychicznego i odporności w przyszłym życiu zawodowym. Artykuł opowiada się za wieloaspektowym podejściem do rozwiązywania tych wyzwań, sugerując, że instytucje medyczne powinny nie tylko skupiać się na doskonałości akademickiej, ale także priorytetowo traktować zdrowie psychiczne swoich studentów, zapewniając bardziej wspierające i pielęgnujące środowisko edukacyjne.

Słowa kluczowe: zdrowie psychiczne, lęk, depresja, studenci medycyny, poszukiwanie profesjonalnej pomocy

INTRODUCTION

Pathological sadness and co-occurring anxiety disorders have accompanied mankind since the dawn of time. Already Plutarch and Hippocrates made history in psychiatry with the following words: [Hippocrates] “If anxiety and distress last a long time, it is melancholy”; [Plutarch] “{In melancholy} the smallest evil is exaggerated under the influence of anxiety; a person faces the worst fate...” (Bilikiewicz and Gallus, 1962). It is worth noting that anxiety and depressive disorders are among the most prevalent health problems (Marek et al., 2005).

Depression is an illness that develops insidiously and can go unnoticed for a long time. Unfortunately, the first symptoms are often underestimated, which delays the diagnosis and implementation of appropriate treatment. Depression and comorbid anxiety disorders can manifest as a depressed mood, constant feelings of sadness and hopelessness, loss of interest, indifference, lack of self-confidence, sleep problems, feelings of helplessness, meaninglessness of life, desire for isolation, suicidal thoughts, problems with memory and concentration, and lack of appetite or overeating (Chand and Arif, 2024). These challenges highlight the critical role of support systems in managing mental health among medical students (Fig. 1).

It is estimated that as much as 3.8% of the population (5% of adults) suffers from depression (Evans-Lacko et al., 2018; Institute of Health Metrics and Evaluation, 2023; Woody et al., 2017). Recently, there has been a definite increase in the number of adolescents and students reporting to mental health professionals (Andrews and Wilding, 2004; Ostaszewski et al., 2017; Płotka and Gajewska, 2002).

With regard to the available data, the incidence of depression in medical students has been shown to range between 10% and 25% (Dahlin et al., 2005; Dyrbye et al., 2006; Goebert et al., 2009; Rosenthal and Okie, 2005; Tjia et al., 2005). It is worth mentioning that female students were more likely than males to develop depression and anxiety disorders. Also, university pressure is not a negligible factor (Mirza et al., 2021). The aim of this article is to present a review of current research on the mechanisms of anxiety and depressive disorders in medical students.

Importantly, mental health issues are not confined to medical students alone; healthcare professionals also experience significant psychological distress. The COVID-19 pandemic, in particular, has exacerbated these issues among medical staff, highlighting the need for comprehensive mental health support across all levels of the healthcare system (Walton et al., 2020).

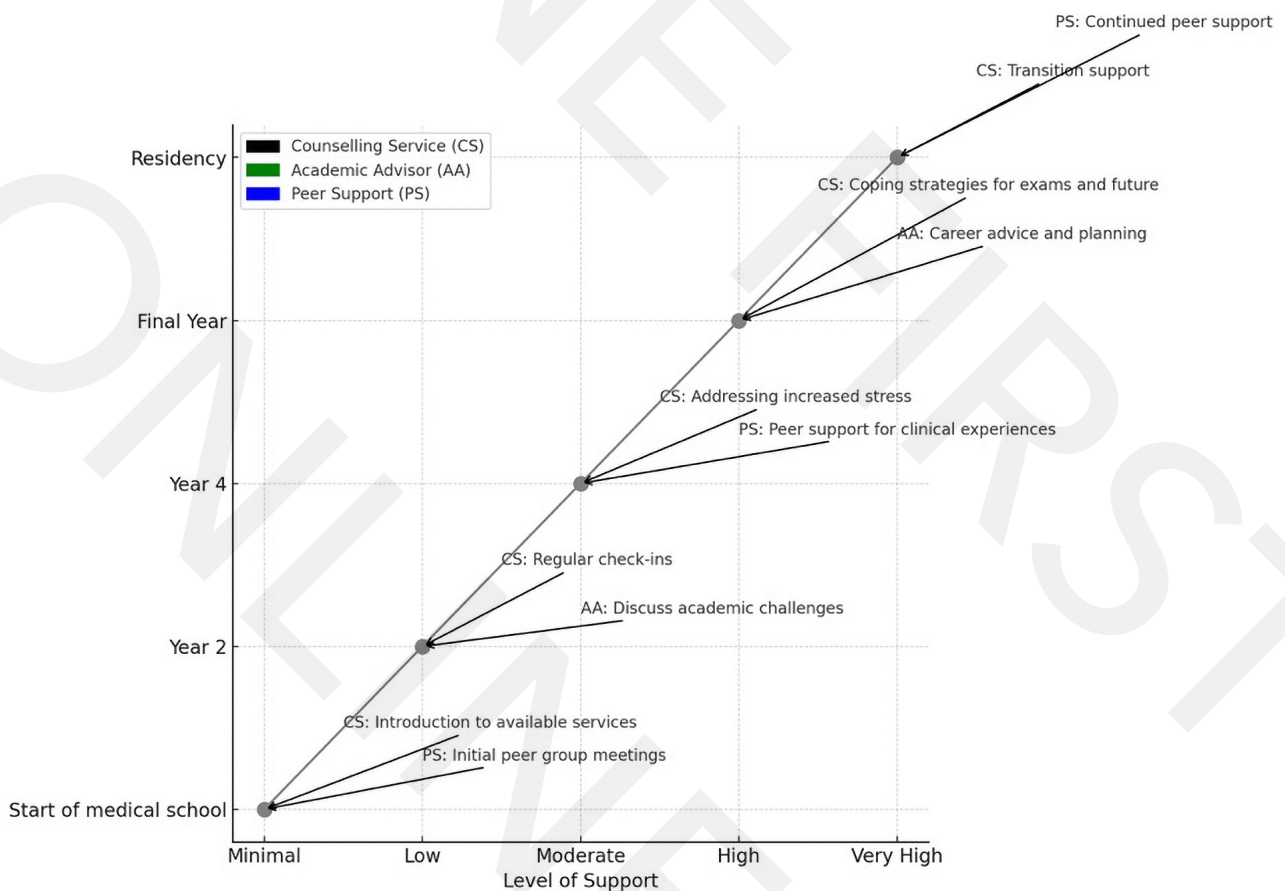


Fig. 1. Levels of mental health support across the educational journey of a medical student

METHODS

Publications available in PubMed and PubMed Central were used for the literature review. The following key word combinations (additionally using search operators) in English were used: “medical students”, “depress*”, “depression”, “well-being”, “anxiety”, “depressive disorders”.

SEARCH RESULTS

The systemic search yielded 77 results: 24 systematic reviews, six meta-analyses, 30 reviews, eight randomised controlled trials, and nine clinical trials (Tab. 1). However, both the article and the accompanying table focus on a carefully selected subset of these studies. The decision to present only

Study type	Author	Year	Country	Number of subjects	Special features
Clinical trial	Ahmed et al.	2009	Saudi Arabia	431	Conducted a clinical trial to explore the effectiveness of different interventions for reducing anxiety and depression among medical students
Clinical trial	Honey et al.	2010	United Kingdom	1,050	Examined the mental health outcomes of medical students compared to non-medical students in a controlled clinical trial setting
Meta-analysis	Puthran et al.	2016	Multiple	62,728	Analysed the prevalence of depression among medical students in different regions
Meta-analysis	Quek et al.	2019	Multiple	40,438	This meta-analysis analysed data from 69 studies involving medical students globally. It found that the global prevalence of anxiety among medical students was 33.8%. The study highlighted the need for medical schools to address anxiety through effective support mechanisms and destigmatisation of mental health issues
Meta-analysis/ Systematic review	Rotenstein et al.	2016	Multiple	129,123	This meta-analysis explored the prevalence of depression and suicidal ideation among medical students. The overall prevalence of depression or depressive symptoms was found to be 27.2%, and the overall prevalence of suicidal ideation was 11.1%. Only 15.7% of those who screened positive for depression sought psychiatric treatment. The study highlighted the need for effective preventive efforts and increased access to care for medical students
Randomised controlled trial (RCT)	Marek et al.	2005	Poland	206	Investigated the prevalence of anxiety and depression among medical students using an RCT design to assess the effectiveness of interventions
RCT	Carletto et al.	2024	Italy	2,403	Assessed the impact of the COVID-19 pandemic on the mental health of medical students through an RCT, exploring different interventions to mitigate anxiety and depression
Review	Slavin et al.	2014	USA	2,500	Explored the mental health of medical students with a focus on curricular changes to improve student wellness
Review	Walton et al.	2020	UK	Not specified	Focused on mental health care for medical staff during the COVID-19 pandemic, providing insights into the heightened stress and anxiety levels during this period
Review	Greenberg et al.	2020	UK	Not specified	Discussed the management of mental health challenges faced by healthcare workers during the COVID-19 pandemic, offering strategies for support and intervention
Review	Chand and Arif	2024	USA	Not specified	Provided a comprehensive overview of depression, focusing on its global prevalence and the impact on specific populations, including medical students
Cross-sectional study	Mousa et al.	2016	United States	462	This study focused on screening medical students and residents for major depressive disorder (MDD) and generalised anxiety disorder (GAD). The prevalence of positive screens for MDD was found to be over five times higher, and for GAD over eight times higher, compared to the general population. The study highlighted the need for increased awareness and support services for medical trainees
Umbrella review	Fernandez et al.	2021	Multiple	169,157	This umbrella review summarised the prevalence of anxiety and depression among healthcare workers during the COVID-19 pandemic. It included 10 systematic reviews covering 100 unique studies from 35 countries. The prevalence of anxiety ranged from 22.2% to 33.0%, while the prevalence of depression ranged from 17.9% to 36.0%. The study highlighted the wide variation in anxiety and depression rates among healthcare workers globally

Tab. 1. Selected research on medical students' mental health

a representative selection from the broader search results was made to emphasise key findings related to the mental health of medical students without overwhelming the reader with an excessive amount of data.

EPIDEMIOLOGY AND PREVALENCE

The worldwide prevalence of depression in the population between 20 and 29 years old is reported to be 6% in women and 4% in men, while anxiety is estimated to affect around 5% of women and 3% of men in the same age group (World Health Organization, 2017).

Studies have also shown that healthcare workers, particularly during the COVID-19 pandemic, have experienced heightened levels of anxiety, depression, and stress. For example, a study conducted at the University Hospital Farhat Hached in Tunisia reported high prevalence rates of these symptoms among medical staff (Belhadj Chabbah et al., 2023).

Among medical students, a meta-analysis found that anxiety had been present in 33.8%, and depression in 30% to 47% of Brazilian medical students.

REGIONAL STUDIES AND FINDINGS

During the review, it was found that the subject matter in question was rarely addressed in Polish-language publications, so English-language literature was mainly used. This paper presents a systematic review of the literature, with full-text publications from 2005–2024 included. In Poland, comprehensive and conclusive studies focused on the epidemiology of mental disorders were conducted, called EZOP I and II. EZOP I gathered data on the prevalence of mental disorders among different demographic groups, providing valuable insights into the mental health landscape in the country. EZOP II built upon the findings of EZOP I, exploring specific aspects, such as risk factors, access to mental health services, and the impact of mental disorders. Both projects informed policymakers, healthcare professionals, and the public, contributing to improvements in mental health services and raising awareness about mental well-being. Unfortunately, the study report does not distinguish the group of medical students or people working in health care in general. However, it is noted that students in general have the lowest incidence of major depressive disorder (1.3%) compared to the general population aged 18–64 (3%) [Kompleksowe badanie stanu zdrowia psychicznego społeczeństwa i jego uwarunkowań (EZOP II), 2023].

STUDIES ON MEDICAL STUDENTS

In 2005, Marek et al. attempted to estimate the frequency of depressive and anxiety symptoms among first- and fourth-year students of the Medical University of Gdańsk. The authors surveyed 206 students (106 first-year students and 100 fourth-year students) using their own seven-question questionnaire and the Hospital Anxiety and Depression

Scale (HADS) adapted by Majkovicz et al. The HADS is a widely used screening tool designed to assess the levels of anxiety and depression in a hospital setting. This scale consists of 14 items, with seven items related to anxiety (HADS-A) and seven items related to depression (HADS-D). The scoring for each item ranges from 0 to 3, with higher scores indicating higher levels of anxiety or depression. The HADS is particularly valued for its ability to detect the presence and severity of these conditions in both hospital patients and the general population. In the scale adapted by Majkovicz et al., scores above 7 (0–7 being recognised as normal) for anxiety were obtained by 41.3% of students, and for depression by 15.5% of students. Over 66% of individuals would be unwilling to consult a psychiatrist if they experienced symptoms of depression. These biases or gaps in accurate information are common among approximately the same proportion of students, whether they are in their first year or fourth year of studies. The only minor distinction is that over the course of three years, there was a modest increase in appreciation for the role of a psychiatrist. The frequency of anxiety complaints was higher in the first year of study compared to the fourth year, and it was higher compared to depressive complaints (Marek et al., 2005).

Research conducted in Italy explored the occurrence of depressive symptoms and their association with cyclothymic temperament. In medical students, the prevalence was around 20%. A higher incidence of depressive symptoms in female medical students was highlighted, whereas the frequency of suicidal thoughts was about 17%, higher in males, which indicates the need for preventive and supportive interventions that consider gender differences. The text also refers to previous studies (Blacker et al., 2019; Campos et al., 2017; Masten, 2019) that reported high rates of suicidal thoughts associated with anxiety and depression and suicidal behaviours in medical students worldwide (Sampogna et al., 2020). A British study by Honney et al. (2010) found that medical students had a lower occurrence of depression than non-medical students, while a meta-analysis showed no significant difference between depression rates in medical and non-medical students (Puthran et al., 2016).

A Swedish study revealed that medical students had a higher incidence of depressive disorders compared to the general population. Factors linked to depression at different academic levels were explored. Year 1 students expressed high levels of stress related to workload and lack of feedback, while Year 3 students reported concerns about future endurance/competence and pedagogical shortcomings. Year 6 students rated these factors highly as well, along with a higher rating for a non-supportive climate compared to the other groups. Lack of feedback was a common complaint across all three cohorts. Female students had higher ratings than males in four out of seven factors. Several stress factors were associated with depression, and the prevalence of depressive symptoms among students was significantly higher at 12.9% compared to the general population. Among female students, the prevalence was 16.1%, while

among males it was 8.1%. A small percentage of students (2.7%) reported having attempted suicide, but none of the attempts occurred in the previous year (Dahlin et al., 2005). Anxiety disorders frequently coexist with depression among medical students around the world. Studies carried out in Pakistan, India, Turkey, Egypt, and Nepal reported high rates of anxiety, ranging from 41.1% to 73% (Quek et al., 2019). A systematic review that included medical colleges across Europe and English-speaking countries outside North America found that the frequency of anxiety varied between 7.7% to 65.5%. Studies in Brazil and Great Britain reported relatively lower rates of anxiety, at 37.2% and 31.2%, respectively. In the Middle East region, a study showed that 28.7% of medical students suffered from anxiety, while a Saudi study found a frequency of 34.9% of among medical undergraduates (Slavin et al., 2014). These high rates could be attributed to factors including preselection for neurotic and perfectionistic individuals, academic workload, financial burden, exposure to patients' deaths, and student abuse. Middle Eastern and Asian medical students had the highest chronicity of anxiety, which could have been due to differing views and levels of acceptance of people with mental illness in different cultures (Dhanoa et al., 2022).

The authors of the article on "Medical Student Mental Health 3.0" concluded that medical schools should put more effort to take care of students' well-being. The authors asserted that there was still much to be done in this area. It is important to routinely monitor the mental health of students and design appropriate interventions, including curricular changes, to improve their well-being. Further research is needed to examine the impact of curricular reform and evaluate programmes to improve student mental health in clinical years (Szemik et al., 2020).

In another study, conducted in Alberta, Canada, a total of 1,148 medical students participated. The research used a descriptive cross-sectional design with self-administered online questionnaires. The study received an ethical approval, and the participants provided their informed consent. Data collection tools included the Patient Health Questionnaire-9 (PHQ-9) for assessing major depressive disorder. The authors concluded that social support was a crucial factor in determining the mental health of medical students. Students who did not feel supported by their friends and family were more likely to experience major depressive disorders. Lack of social support could contribute to the onset of depressive symptoms and increase the risk of burnout. The authors concluded that medical schools should encourage social interactions among medical students and design interventions aimed at strengthening social support (Dhanoa et al., 2022).

INFLUENCE OF PERSONALITY TRAITS AND SOCIODEMOGRAPHIC INFORMATION

According to Szemik et al. (2020), certain personality traits are of particular importance when suffering from anxiety-depressive disorders. Research suggests that neuroticism

may be related to perceived stress and symptoms of depression and anxiety. Extraversion and conscientiousness, on the other hand, had a preventive role in the development of depressive symptoms. Type D personality, characterised by negative emotionality and social inhibition, could lead to diminished well-being, depression tendencies, and low life satisfaction. Type A personality may be associated with occupational burnout, mental health deterioration, and depression in doctors and nurses. A link between Type D personality and mortality in patients with cardiovascular disease has also been identified. The study pointed to the need for further understanding of the impact of personality on the health and quality of life of medical students and professional medical workers. Thus, people who were introverts and overly stressed by their education were more likely to develop the illness. In addition, students characterised by high levels of neuroticism were more likely to attempt suicide (Szemik et al., 2020).

According to Ahmed et al. (2009), lack of self-esteem, a lower socioeconomic background of the family, and elevated academic workload are strong predictors of anxiety and stress among students. Their study aimed to investigate depression and anxiety in medical doctors, students, and staff at various healthcare centres in Dubai. A cross-sectional design was employed, and the participants completed the Beck Depression Inventory (BDI) and Beck Anxiety Inventory (BAI). The results showed a significant prevalence of depression (28.6%) and anxiety (28.7%) among medical students, while medical staff had lower rates (7.8% for depression and 2.2% for anxiety). Second-year medical students exhibited the highest levels of depression and anxiety. The study highlighted the need for further research to understand the factors contributing to depression and anxiety in this population (Ahmed et al., 2009).

Carletto et al. (2024) conducted a very interesting study in Italy, enrolling students from the second to sixth year of the School of Medicine at the University of Turin. A total of 2,403 students were invited to participate in an electronic survey conducted from December 2020 to February 2021. The survey, based on Psychosocial Report in Italian Medical Students (PRIMES), included sociodemographic information, impact of the pandemic, and measures for anxiety, depression, and perceived stress. Descriptive analysis, tests, and regression models adjusted for age, gender, and year of study examined the associations. The results showed that pandemics were a risk factor for increased depression and anxiety symptoms. This was noticeable especially after COVID-19. The COVID-19 pandemic has had a negative impact on the mental health of medical students (Carletto et al., 2024).

IMPACT OF SLEEP QUALITY

A cross-sectional study was conducted among medical students at a German university to collect data on their mental health. The survey was anonymous and administered

during obligatory sessions or taken home and returned in sealed containers. The questionnaire included measures for depressive symptoms (BDI-II) and sleeping patterns (Pittsburgh Sleep Quality Index, PSQI). Statistical analysis involved descriptive statistics and binary logistic regression using the BDI-II score as the dependent variable. It acknowledged that students with poor sleep quality, consumption of sleeping pills, prolonged sleep latency, and sleep duration of less than seven hours were at risk of experiencing depressive symptoms. 65% of European medical students are reported to be affected by poor sleep quality (Dudo et al., 2022).

SEEKING PROFESSIONAL HELP

Unfortunately, not many students who are in need seek professional help. A systematic review and meta-analysis of 195 studies involving 129,123 medical students in 47 countries found that 27.2% of students screened positive for depression and 11.1% reported suicidal ideation during medical school. However, only 15.7% of students who screened positive for depression sought treatment. These findings are concerning, as depression and suicidality have been linked to increased short-term risk of suicide and higher long-term risk of future depressive episodes and morbidity. The prevalence of depressive symptoms among medical students was higher than that reported in the general population. Factors responsible for depression in medical students may also be operative in other undergraduate and professional schools. The high occurrence of suicidal ideation underscores the need for effective preventive efforts and increased access to care that accommodate the needs of medical students and the demands of their training (Rotenstein et al., 2016).

According to Suwalska et al. (2017), despite gaining knowledge about psychiatric distress and how to treat it, medical students often do not regard depression as an illness that requires treatment. Many of them feared that disclosing the illness might influence their carriers and that seeking psychiatric care may lead to stigma. The authors concluded that it was important to ensure that medical students would have access to healthcare and psychological support to prevent depression, stress, and professional burnout (Suwalska et al., 2017).

USE OF PSYCHOTROPIC DRUGS

A Brazilian study found that medical students often reached for psychotropic drugs. In this study, it was exposed that a significant portion of the participants (41.4%) had used psychotropic drugs at some point in their lives, and 30.4% were currently using them. The most common reasons for that were psychological distress, anxiety, depression, insomnia, and panic attacks. The prevalence of psychiatric disorders and psychotropic drug use increased as students progressed through medical school, although there might have

been a reduction in the third and fourth years. Risk factors for mental health issues also included lack of regular physical activity (Fasanella et al., 2022).

DISCUSSION

Our review highlights the significant prevalence of depression and anxiety symptoms among medical students, confirming the findings of previous studies (Dyrbye et al., 2006). However, it is essential to delve deeper into the implications of these findings and provide practical recommendations for addressing these issues.

Firstly, geographical variation in mental health symptoms suggests that cultural stigmas and differing mental health support systems play a crucial role (Chand and Arif, 2024). Therefore, medical schools should tailor their mental health interventions to the specific cultural context of their student body. For instance, in regions where mental health stigma is prevalent, schools could implement anonymous counselling services and mental health awareness campaigns to reduce stigma and encourage help-seeking behaviour.

Gender disparities, with female students exhibiting higher rates of depressive symptoms (Institute of Health Metrics and Evaluation, 2023), highlight the need for gender-specific support strategies. Implementing targeted interventions that address the unique challenges faced by female students could help mitigate these disparities. For example, peer support groups and mentorship programmes for female medical students could provide a supportive environment to discuss and manage stressors related to both academic pressures and societal expectations.

Curricular pressures and academic demands were prevalent stressors, which is consistent with findings from other research (Woody et al., 2017). Similarly, healthcare workers face significant stressors in their professional environment. Studies have indicated that the mental health challenges faced by medical professionals, including doctors and nurses, have intensified during the COVID-19 pandemic due to increased workload and exposure to trauma (Greenberg et al., 2020).

Innovative curricular changes, such as the incorporation of wellness programmes and stress management workshops, could be explored further for their effectiveness in alleviating mental health issues. Additionally, schools could offer flexible scheduling and reduce excessive academic workload to help students maintain a better work-life balance. The process of managing mental health among students involves multiple stages, each critical for ensuring well-being (Fig. 2).

Studies have indicated a higher prevalence of mental health issues, including stress, anxiety, and depression, among medical students compared to the general population. These symptoms could negatively impact their academic and social performance, as well as their future patients (Del-Ben et al., 2013; Quek et al., 2019; de Vasconcelos et al., 2015). Unfortunately, the results collected are inconsistent and the

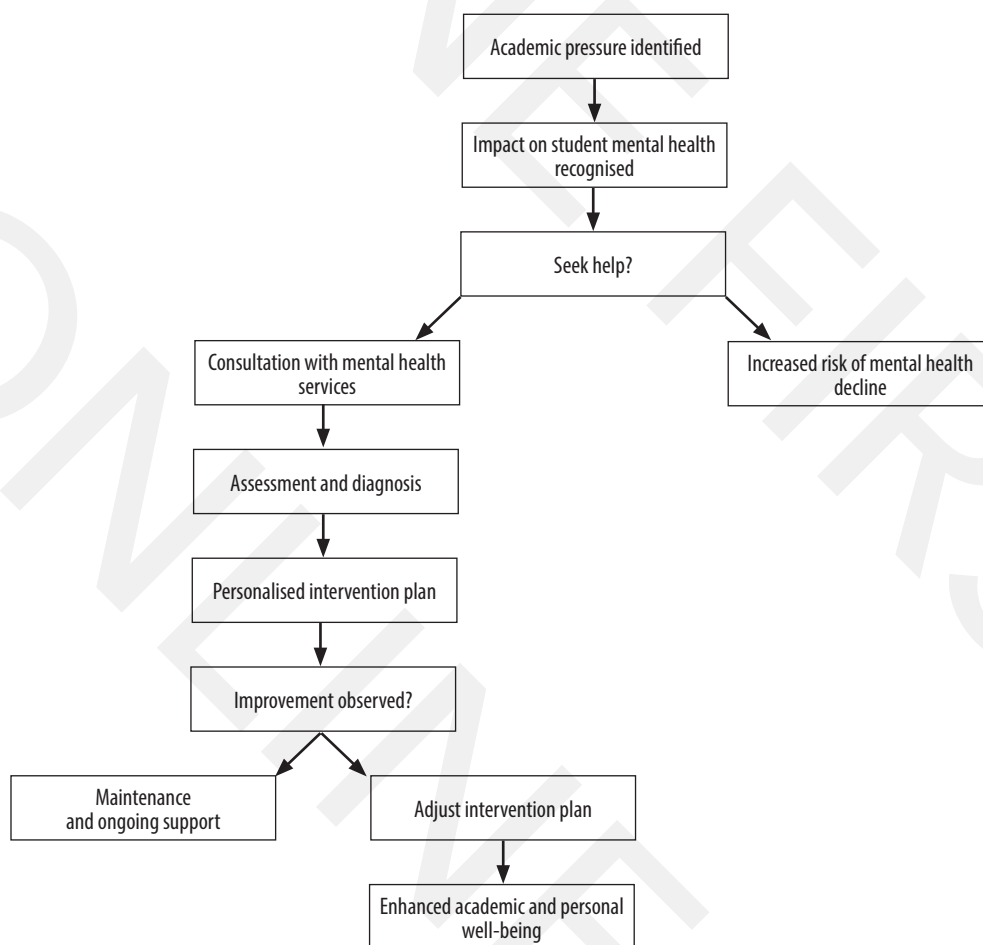


Fig. 2. Process of managing mental health and constant need for support

percentages obtained vary due to differences in research methodologies and variables used. The differences between countries are also unclear. Despite the number of conducted studies, direct comparisons are not available.

Interestingly, personality traits such as neuroticism were linked to higher susceptibility to mental health challenges (Szemik et al., 2010). In addition to medical students, healthcare workers with certain personality traits, such as high neuroticism, may also be more susceptible to anxiety and depression. This suggests that targeted mental health interventions are necessary for both students and practising medical professionals (Mousa et al., 2016).

This opens avenues for early identification and targeted support for students displaying such traits. Medical schools could integrate psychological assessments during admissions to identify students who may be at higher risk of developing mental health issues and offer them additional support from the beginning of their studies.

Regardless of the results, one thing is certain – medical students are often at higher risk of developing mental disorders at least for several reasons. Prominent among them are high academic demands, high stress levels, lack of free time, emotional strain, and social isolation. Therefore, it is

crucial for medical schools to establish a comprehensive mental health support system that includes regular mental health check-ups, easy access to counselling services, and the promotion of a supportive community among students and faculty.

Moving forward, more comprehensive and longitudinal studies are necessary to gain deeper insights into the evolving mental health needs of medical students. Furthermore, the mental health of healthcare workers requires similar attention. The high prevalence of psychological distress among medical staff during the COVID-19 pandemic underscores the urgent need for systemic mental health support in healthcare settings (Fernandez et al., 2021).

Additionally, the effectiveness of mental health interventions and support systems should be a focal point of future research to foster a supportive educational environment for medical students. Implementing robust mental health support systems for healthcare workers is equally crucial. Strategies such as regular mental health check-ups, anonymous counselling services, and stress management programmes should be prioritised (Dyson and Norrie, 2019).

Collaboration with mental health professionals to design and implement these interventions could ensure that they

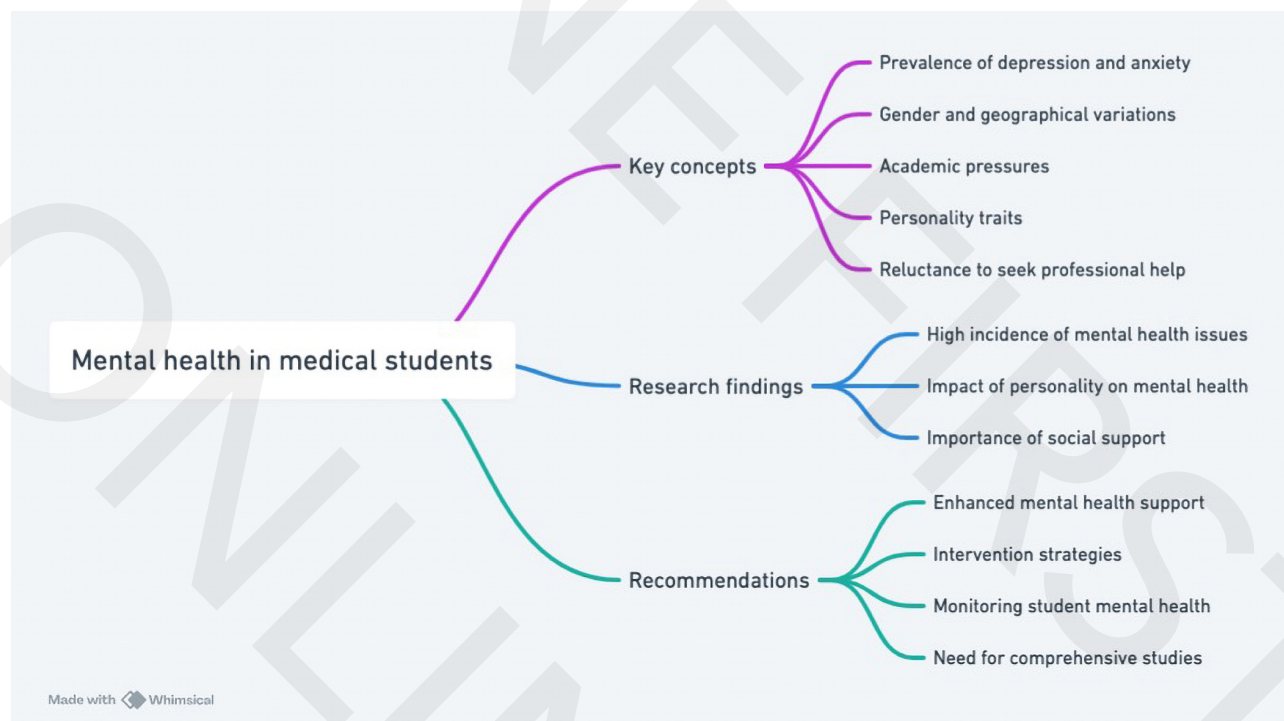


Fig. 3. Key concepts, findings, and recommendations

are evidence-based and tailored to the specific needs of medical students.

The research conducted gives us insight into the mental health situation of medical students, but it does not exhaust the subject, and more reliable research needs to be done. Expanding the scope of mental health research to include both medical students and healthcare professionals will enable the development of more comprehensive support systems that address the needs of the entire medical community.

CONCLUSIONS

Through its comprehensive, multifactorial, and nuanced approach, this review contributes uniquely to the existing literature by providing a more global, diverse, and in-depth understanding of the mental health challenges faced by medical students, along with practical recommendations for support and intervention. These findings underscore the importance of implementing comprehensive strategies to address mental health challenges among medical students (Fig. 3).

The transition from secondary school to college education can be challenging for students, leading to increased stress levels and mental health issues. Medical students in particular may experience higher rates of mental and emotional problems compared to students in non-medical fields. As mentioned above, promoting, and prioritising strategies for self-care and stress management, and providing access to mental health resources are essential for supporting the

well-being of medical students (Szemik et al., 2020). There is a need for preventive and supportive interventions that take into account gender differences and address suicide risk. Common issues reported include mood disorders, social anxiety, difficulties with concentration and motivation, eating disorders, and addictions. Consequently, medical schools should make a greater effort to monitor the mental health of students and promote healthy habits. Academic policymakers should design appropriate interventions, including curricular changes, to improve students' well-being. Therefore, social interactions should be encouraged and support services provided (Dhanoa et al., 2022). Further research is needed to evaluate programmes to improve student mental health in clinical years. The growing demand for psychological support among students highlights the importance of prioritising and monitoring their well-being throughout their academic journey.

Similar attention should be given to the mental health of healthcare workers, especially given the high prevalence of psychological distress among medical staff during the COVID-19 pandemic (Fernandez et al., 2021).

It is equally crucial to implement robust mental health support systems for healthcare workers, prioritising strategies such as regular mental health check-ups, anonymous counselling services, and stress management programmes (Dyson and Norrie, 2019).

Expanding the scope of mental health research to include both medical students and healthcare professionals will help develop more comprehensive support systems for the entire medical community.

Conflict of interest

The authors do not report any financial or personal connections with other persons or organisations which might negatively affect the contents of this publication and/or claim authorship rights to this publication.

Author contribution

Original concept of study: MM. Collection, recording and/or compilation of data: MM. Analysis and interpretation of data: MM. Writing of manuscript: MM. Critical review of manuscript: PM, MW, AS. Final approval of manuscript: PM, AS.

References

- Ahmed I, Banu H, Al-Fageer R et al.: Cognitive emotions: depression and anxiety in medical students and staff. *J Crit Care* 2009; 24: e1–e7.
- Andrews B, Wilding JM: The relation of depression and anxiety to life-stress and achievement in students. *Br J Psychol* 2004; 95: 509–521.
- Belhadj Chabbah N, Chatti S, Athimni Z et al.: Levels of anxiety, depression and stress among health care workers during the COVID-19 pandemic: study conducted at the University Hospital Farhat Hached of Sousse-Tunisia. *Eur Psychiatry* 2023; 64 (S1): S815.
- Bilikiewicz T, Gallus J: *Psychiatria polska na tle dziejowym*. Państwowy Zakład Wydawnictw Lekarskich, Warszawa 1962.
- Blacker CJ, Lewis CP, Swintak CC et al.: Medical student suicide rates: a systematic review of the historical and international literature. *Acad Med* 2019; 94: 274–280.
- Campos RC, Holden RR, Costa F et al.: The moderating effect of gender on the relationship between coping and suicide risk in a Portuguese community sample of adults. *J Ment Health* 2017; 26: 66–73.
- Carletto S, Lo Moro G, Zuccaroli Lavista V et al.: The impact of COVID-19 on mental health in medical students: a cross-sectional survey study in Italy. *Psychol Rep* 2024; 127: 620–648.
- Chand SP, Arif H: Depression. In: *StatPearls* [Internet]. StatPearls Publishing, Treasure Island, FL 2024 Jan–.
- Dahlin M, Joneborg N, Runeson B: Stress and depression among medical students: a cross-sectional study. *Med Educ* 2005; 39: 594–604.
- Del-Ben CM, Machado VF, Madisson MM et al.: Relationship between academic performance and affective changes during the first year at medical school. *Med Teach* 2013; 35: 404–410.
- Dhanoa S, Oluwasina F, Shalaby R et al.: Prevalence and correlates of likely major depressive disorder among medical students in Alberta, Canada. *Int J Environ Res Public Health* 2022; 19: 11496.
- Dudo K, Ehring E, Fuchs S et al.: The association of sleep patterns and depressive symptoms in medical students: a cross-sectional study. *BMC Res Notes* 2022; 15: 109.
- Dyrbye LN, Thomas MR, Shanafelt TD: Systematic review of depression, anxiety, and other indicators of psychological distress among U.S. and Canadian medical students. *Acad Med* 2006; 81: 354–373.
- Dyson S, Norrie P: Mental illness among NHS health care workers: a survey. *British Journal of Mental Health Nursing* 2019; 8: 129–135.
- Evans-Lacko S, Aguilar-Gaxiola S, Al-Hamzawi A et al.: Socio-economic variations in the mental health treatment gap for people with anxiety, mood, and substance use disorders: results from the WHO World Mental Health (WMH) surveys. *Psychol Med* 2018; 48: 1560–1571.
- Fasanella NA, Custódio CG, Cabo JSD et al.: Use of prescribed psychotropic drugs among medical students and associated factors: a cross-sectional study. *Sao Paulo Med J* 2022; 140: 697–704.
- Fernandez R, Sikhosana N, Green H et al.: Anxiety and depression among healthcare workers during the COVID-19 pandemic: a systematic umbrella review of the global evidence. *BMJ Open* 2021; 11: e054528.
- Goebert D, Thompson D, Takeshita J et al.: Depressive symptoms in medical students and residents: a multischool study. *Acad Med* 2009; 84: 236–241.
- Greenberg N, Docherty M, Gnanapragasam S et al.: Managing mental health challenges faced by healthcare workers during covid-19 pandemic. *BMJ* 2020; 368: m1211.
- Honney K, Buszewicz M, Coppola W et al.: Comparison of levels of depression in medical and non-medical students. *Clin Teach* 2010; 7: 180–184.
- Institute of Health Metrics and Evaluation: Global Health Data Exchange (GHDx). Available from: <http://ghdx.healthdata.org/> [cited: 20 May 2023].
- Kompleksowe badanie stanu zdrowia psychicznego społeczeństwa i jego uwarunkowań (EZOP II). Cel badania. Available from: <https://ezop.edu.pl/cel-badania/> [cited: 20 May 2023].
- Marek K, Białoń P, Wichowicz H et al.: Przesiewowa ocena rozpoznania objawów depresyjnych i lękowych wśród studentów Akademii Medycznej w Gdańsku. *Psychiatria* 2005; 2: 217–224.
- Masten AS: Resilience from a developmental systems perspective. *World Psychiatry* 2019; 18: 101–102.
- Mirza AA, Baig M, Beyari GM et al.: Depression and anxiety among medical students: a brief overview. *Adv Med Educ Pract* 2021; 12: 393–398.
- Mousa OY, Dhamoon MS, Lander S et al.: The MD blues: under-recognized depression and anxiety in medical trainees. *PLoS One* 2016; 11: e0156554.
- Ostaszewski K, Bobrowski K, Borucka A et al.: Monitorowanie zachowań ryzykownych, zachowań nałogowych, problemów zdrowia psychicznego 15-letniej młodzieży. *Badania mokotowskie 2004–2016. Badania ukraińskie, obwód lwowski 2016*. Instytut Psychiatrii i Neurologii w Warszawie, Warszawa 2017.
- Płotka A, Gajewska M: Analiza przyczyn zgłaszalności studentów do Poradni Zdrowia Psychicznego w Łodzi. *Pieleg Pol* 2002; 2: 283–287.
- Puthran R, Zhang MW, Tam WW et al.: Prevalence of depression amongst medical students: a meta-analysis. *Med Educ* 2016; 50: 456–468.
- Quek TT, Tam WW, Tran BX et al.: The global prevalence of anxiety among medical students: a meta-analysis. *Int J Environ Res Public Health* 2019; 16: 2735.
- Rosenthal JM, Okie S: White coat, mood indigo – depression in medical school. *N Engl J Med* 2005; 353: 1085–1088.
- Rotenstein LS, Ramos MA, Torre M et al.: Prevalence of depression, depressive symptoms, and suicidal ideation among medical students: a systematic review and meta-analysis. *JAMA* 2016; 316: 2214–2236.
- Sampogna G, Lovisi GM, Zinno F et al.: Mental health disturbances and related problems in Italian university medical students from 2000 to 2020: an integrative review of qualitative and quantitative studies. *Medicina (Kaunas)* 2020; 57: 11.
- Slavin SJ, Schindler D, Chibnall JT: Medical student mental health 3.0: improving student wellness through curricular changes. *Acad Med* 2014; 89: 573–577.
- Suwalska J, Suwalska A, Szczygieł M et al.: Medical students and stigma of depression. Part 2. Self-stigma. *Psychiatr Pol* 2017; 51: 503–513.
- Szemik S, Gajda M, Kowalska M: [The review of prospective studies on mental health and the quality of life of physicians and medical students]. *Med Pr* 2020; 71: 483–491.
- Tjia J, Givens JL, Shea JA: Factors associated with undertreatment of medical student depression. *J Am Coll Health* 2005; 53: 219–224.
- de Vasconcelos TC, Dias BRT, Andrade LR et al.: Prevalência de sintomas de ansiedade e depressão em estudantes de medicina. *Revista Brasileira de Educação Médica* 2015; 39: 135–142.
- Walton M, Murray E, Christian MD: Mental health care for medical staff and affiliated healthcare workers during the COVID-19 pandemic. *Eur Heart J Acute Cardiovasc Care* 2020; 9: 241–247.
- Woody CA, Ferrari AJ, Siskind DJ et al.: A systematic review and meta-regression of the prevalence and incidence of perinatal depression. *J Affect Disord* 2017; 219: 86–92.
- World Health Organization: Depression and Other Common Mental Disorders: Global Health Estimates. World Health Organization, Geneva 2017. Available from: <https://apps.who.int/iris/bitstream/handle/10665/254610/WHO-MSD-MER-2017.2-eng.pdf> [cited: 20 May 2023].