

Prevalence of mental health problems among medical students in Brazil: an updated systematic review and meta-analysis of 126 studies

Vitor Melo¹, Rafael Balac¹, Marinho Marques², and Ailton Melo³

¹Medical student, School of Medicine, Universidade Salvador, Salvador, Brazil

²MD, PhD, Professor, Department of Life Sciences, Universidade do Estado da Bahia, Salvador, Brazil

³MD, PhD, Professor, Department of Neurosciences, Universidade Federal da Bahia, Salvador, Brazil

Abstract

Background: Medical students in Brazil experience high rates of mental health problems (MHPs). However, the current prevalence rates in this population remain unknown. Therefore, the authors aimed to estimate the prevalence of MHPs among medical students in Brazil. **Methods:** In this systematic review and meta-analysis, PubMed, Embase, Scopus, LILACS, and PsycINFO were searched for cross-sectional studies published in peer-reviewed journals that reported the prevalence of MHPs in a medical student sample in Brazil and utilized validated instruments translated to Portuguese. A DerSimonian-Laird random-effects model was used to calculate the pooled prevalence of each different MHP, for males and females, and for studies conducted before and after the pandemic outbreak. Registered in PROSPERO, number: CRD42024499416. **Results:** Ultimately, 126

studies were included, aggregating data from 47,513 medical trainees. The pooled prevalence was 36.3% (95% CI 31.2–41.6) for depressive symptoms, 41.2% (33.8–48.8) for anxiety symptoms, 38.7% (32.3–45.3) for common mental disorders, 65.6% (58.5–72.4) for poor sleep quality, among other MHPs. Female students showed higher prevalence rates than males, except for alcohol abuse. For depression, pre-Covid-onset studies yielded a pooled prevalence of 34.8% (29.1–40.7) compared to 43.4% (31.0–56.3) in post-Covid-onset studies ($p=0.22$). **Conclusions:** These findings underscore the need for greater emphasis on mental health care and support during medical training in Brazil.

Keywords: Epidemiology, Universities, Mental Disorders, South America, Public Health, Sleep Quality, Burnout, Substance-Related Disorders

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Email: Vitor Melo (vitormfmelo@gmail.com)

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Background:

Mental health problems (MHPs) are among the most prevalent health-related issues worldwide and are leading causes of disease burden. Among those most susceptible to the wide array of MHPs are university students, with medical students experiencing especially high rates.^{1,2,3} Some studies suggest that the highly competitive academic environment, demanding workload, and peer pressure are contributing factors for a diminished quality of life and poor mental health in this population.⁴

Within the Brazilian context, a review from 2016 reported elevated prevalence rates of different MHPs, such as excessive daytime sleepiness (46.1%), general anxiety (32.9%), depression (30.6%), common mental disorders (31.5%), low

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sleep quality (51.5%), and stress (49.9%), among medical trainees in the country.⁵ Since then, a significant number of new primary studies have been published, reflecting the growing interest in this subject.

Additionally, the onset of the COVID-19 pandemic in 2020 significantly influenced the mental health landscape—globally and in Brazil. Numerous factors contributing to poor mental health outcomes were exacerbated, which influenced the frequency of various MHPs. A study conducted in 2020, assessing the prevalence of depressive and anxiety disorders in 204 countries and territories estimated that during the pandemic, the prevalence of major depressive disorder and anxiety disorders increased globally by 25% and 28%, respectively, particularly among younger individuals.⁶ In Brazil, while

numerous primary studies have been published, they are fragmented and present varying results from different populations. Consequently, the current epidemiological state of MHPs among Brazilian medical students remains unknown.

While extensive primary data on mental health issues exist among medical trainees in Brazil, the COVID-19 pandemic has introduced a new epidemiological landscape. Therefore, this study aimed to conduct a systematic review of the available literature to estimate the prevalence of MHPs among medical students in Brazil via meta-analysis, and to assess the pooled prevalence of studies conducted before and after the onset of the COVID-19 pandemic in the country.

Methods:

This systematic review was registered in the PROSPERO International Prospective Register of Systematic Reviews (registration number CRD42024499416) and is reported in line with the Preferred Reporting Items for Systematic Reviews and Meta-Analysis checklist (PRISMA).

Search strategy and selection criteria:

In this systematic review and meta-analysis, we searched PubMed, EMBASE, Scopus, LILACS and PsycINFO from database inception until Feb 20, 2024, to identify all relevant cross-sectional studies that reported the prevalence of MHPs (e.g., depressive or anxiety symptoms, burnout syndrome, suicidal ideation, etc.) among medical students in Brazil. There were no restrictions on language or date of publication. The search strategy for all databases used the following terms: "medical students", "undergraduate students", "mental health", "depressive disorder", "depression", "mood disorders", "bipolar, schizophrenia, stress, anxiety, burnout," "panic disorder", "panic attack", "affective disorders", "behavioral symptoms", "suicide, suicidal", "sleep disorders", "sleep deprivation", "sleep quality", "sleep wake disorders", "personality disorders", "substance-related disorders", "Brazil, Brazilian, Brasil". In addition to these bibliographic database searches, the references of all relevant research articles were scrutinized to identify additional data sources. A complete list of search terms for MEDLINE is provided in an Appendix available upon request to Author.

Eligibility criteria:

To be included in this review, primary studies had to be cross-sectional studies reporting the prevalence

of one or more MHPs in a sample of medical student in Brazil, published in a peer-reviewed journal, and utilizing validated instruments translated into Brazilian Portuguese. For international multicenter studies, separate data on the Brazilian sample should be reported. We excluded studies that focused on university students without subgroup analysis of medical students; studies using questionnaires in which the primary focus was not the assessment of an MHP (e.g., quality of life questionnaires, lifestyle questionnaires); studies with samples comprising only one sex; studies published in formats that do not undergo peer review (e.g., letter to the editor); cross-sectional studies with data collection at different time periods on the same sample (e.g., at the beginning and end of the year); and studies with overlapping data from another included study (in such cases, the most comprehensive report with the largest sample size was included). If the full text was not available, the corresponding author was contacted via e-mail. If a study had overlapping data with one of the included studies but presented data on additional MHPs, only the latter was included.

Selection process:

Two reviewers independently screened the titles and abstracts identified in the literature search. The full texts of potentially eligible articles were obtained to determine whether the studies met the eligibility criteria. Disagreements were resolved through discussions between the two authors until consensus was reached. A third reviewer was available for arbitration, if needed.

Data items:

Two investigators independently extracted relevant information from individual studies using a preconceived and standardized data extraction form, including the first author, publication year, period of data collection (year and month range), Brazilian state and region (North, Northeast [NE], Central-West [CW], Southeast [SE] and South) where recruitment was performed, sample size, mean or median sample age, proportion of female participants, MHP assessed, instrument and cutoff score used, prevalence in the total sample, and prevalence in males and females, when available. The data collection periods of the included studies were dichotomized into pre-pandemic and post-pandemic onset. Studies were considered to have been conducted after the onset of the COVID-19 pandemic if data collection began after March 2020, when the initial physical distancing and isolation measures started in Brazil, or if it was explicitly

stated in the methods section that data collection was performed entirely during the COVID-19 pandemic. Studies that began data collection before this date but completed it afterwards were labeled as “overlapping”. Any discrepancies were resolved through discussion and consensus among the authors. When relevant data were not available, we contacted the corresponding authors of the studies to request the information.

Risk of bias assessment:

We assessed the methodological quality of the included studies using The Joanna Briggs Institute Critical Appraisal Checklist for studies reporting prevalence data. This checklist contains nine questions, and answers could be “yes,” “no,” “unclear,” or “not applicable.” The cutoff points were determined according to previous systematic reviews and were as follows: risk of bias (RoB) was defined as “high” when the study reached up to 49% score “yes”; “moderate” when the study reached 50% to 69% score “yes”; and “low” when the study reached more than 70% score “yes”.^{7,8} Two reviewers independently assessed study quality, with disagreements resolved by consensus or arbitration by a third author. Additionally, each study was given a global score ranging from 0 to 9 based on the number of questions answered “yes”, with higher scores indicating higher quality studies.

Studies classified as having a moderate to low RoB according to these criteria were synthesized separately using the methods described below.

Synthesis methods:

A meta-analysis was performed to assess the pooled prevalence of the different MHPs. We pooled the prevalence estimates from studies for each mental health issue using the DerSimonian-Laird random-effects model, and the prevalence estimates were transformed via the Freeman-Tukey double arcsine transformation. Between-study heterogeneity was assessed using the I^2 statistic. The results are presented in forest plots with 95% confidence intervals (95% CI). Analyses were performed using the meta package in R (version 4.0.5).

We performed a subgroup analysis to explore the role of the dichotomized data collection period (pre-pandemic onset vs. post-pandemic onset) on MHPs prevalence whenever at least eight studies were available for each period. Meta regression was used for continuous variables: “year of data collection” and “RoB score”. Statistical significance was set at p -value < 0.05. We also conducted a sensitivity

analysis that included studies reporting prevalence estimates for the same MHP using the most frequently employed screening instrument and its most common cutoff (e.g., depressive symptoms assessed by the Beck Depression Inventory with a cutoff score of ≥ 10). Additionally, owing to Brazil’s large territorial size, analyses were also grouped by geographic macroregion.

We did not assess publication bias in this study because it only included prevalence studies. As discussed by Borenstein,⁹ the procedures to address publication bias are based on the premise that statistically significant studies are more likely to be published than those that are not; this premise does not apply to studies reporting the prevalence of a condition (e.g., depressive symptoms) in a sample. This approach aligns with other guidelines for conducting proportional meta-analyses.¹⁰

Results:

Study selection:

We initially identified 2,572 records through the database search. After the removal of duplicates, 2,078 records were screened by title and abstract, of which 217 full-text articles were reviewed, and 126 were included in analysis (Figure 1). The list of studies excluded at the full-text screening stage, along with reasons for exclusion, can be found in an Appendix available upon request to Author.

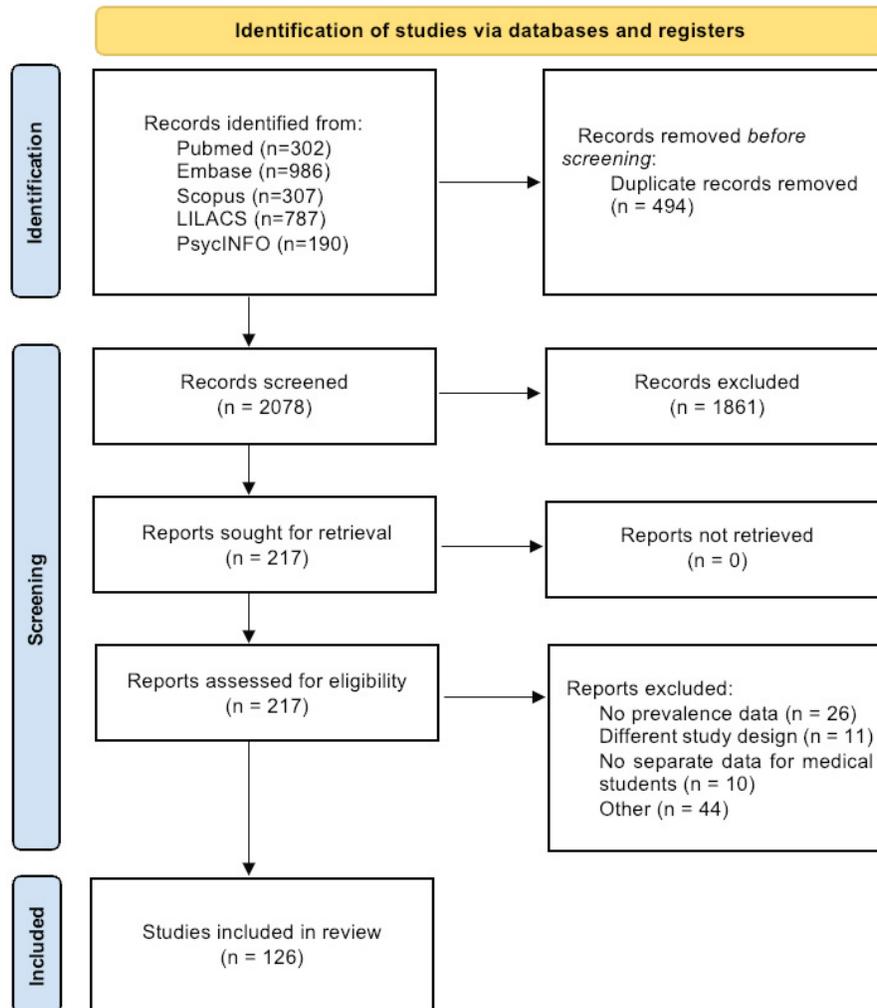
Study characteristics:

A total of 47,513 medical students in Brazil were included in the review, with sample sizes ranging from 35 to 4,840. The mean or median age of students varied from 20 to 27.7 years (range 17 – 41), and the proportion of female participants varied from 39.1% to 80.6% across the included studies. A total of 102 studies provided information from data collected before March 2020 (labeled as pre-Covid-onset),^{11–112} 20 after the referred date (post-Covid-onset),^{113–132} and four were undetermined.^{133–136} Regarding the five Brazilian territorial macro regions, 35 studies were conducted in the NE region, two from the North region, 49 from the SE region, five from the CW region, and 24 from the South region; eight were multicenter studies, and three did not report. Information on each study is available in an Appendix available upon request to Author.

RoB in studies:

For the RoB assessment, 37 (29.4%) studies were classified as having a low risk of bias, 66 (52.4%) as having a moderate risk and 23 (18.2%) as having a

Figure 1



high risk. The item with the most unsatisfactory response among the studies was question five: “Was the data analysis conducted with sufficient coverage of the identified sample?”, as only 42 (33.3%) studies received a “yes” score. The most common RoB score was five, which was assigned to 35 studies. The lowest score was two, which was received by six studies, whereas the highest score was nine, which was assigned to two studies.

Results of synthesis:

In the 50 studies (n=24,072 participants) in which the prevalence of depressive symptoms was reported, the pooled estimate from the random-effects meta-analysis was 36.3% (95% CI 31.2–41.6, I²=99%) (Figure 2). Meta-analytic pooling from the 20 studies that provided values for males and females yielded a pooled prevalence of 27.9% (95% CI 20.6-35.8, I²=96%) for males and 36.8%

(95% CI 28.0-46.9, I²=98%) for females. The prevalence of anxiety symptoms was reported in 29 studies (n=12414 subjects), yielding a pooled prevalence of 41.2% (95% CI 33.8-48.8, I²=99%) (Figure 3). Eight studies provided prevalence data for males (27.4% [95% CI 19.7-35.7, I²=88%]) and females (39.8% [95% CI 30.6-49.3, I²=94%]). The pooled prevalence estimates of other MHPs are displayed in Table 1.

For subgroup analysis based on the time of data collection, 41 pre-Covid-onset studies (n=20,084 subjects) assessed the prevalence of depressive symptoms, resulting in a pooled prevalence of 34.8% (95% CI 29.1-40.7, I²=98%), whereas the nine post-Covid-onset studies (n=3,988 subjects) reported a pooled prevalence of 43.4% (95% CI 31.0-56.3, I²=99%; test for subgroup differences p=0.22). Regarding anxiety symptoms, subgroup

Figure 2: Pooled prevalence of depressive symptoms among medical students in Brazil

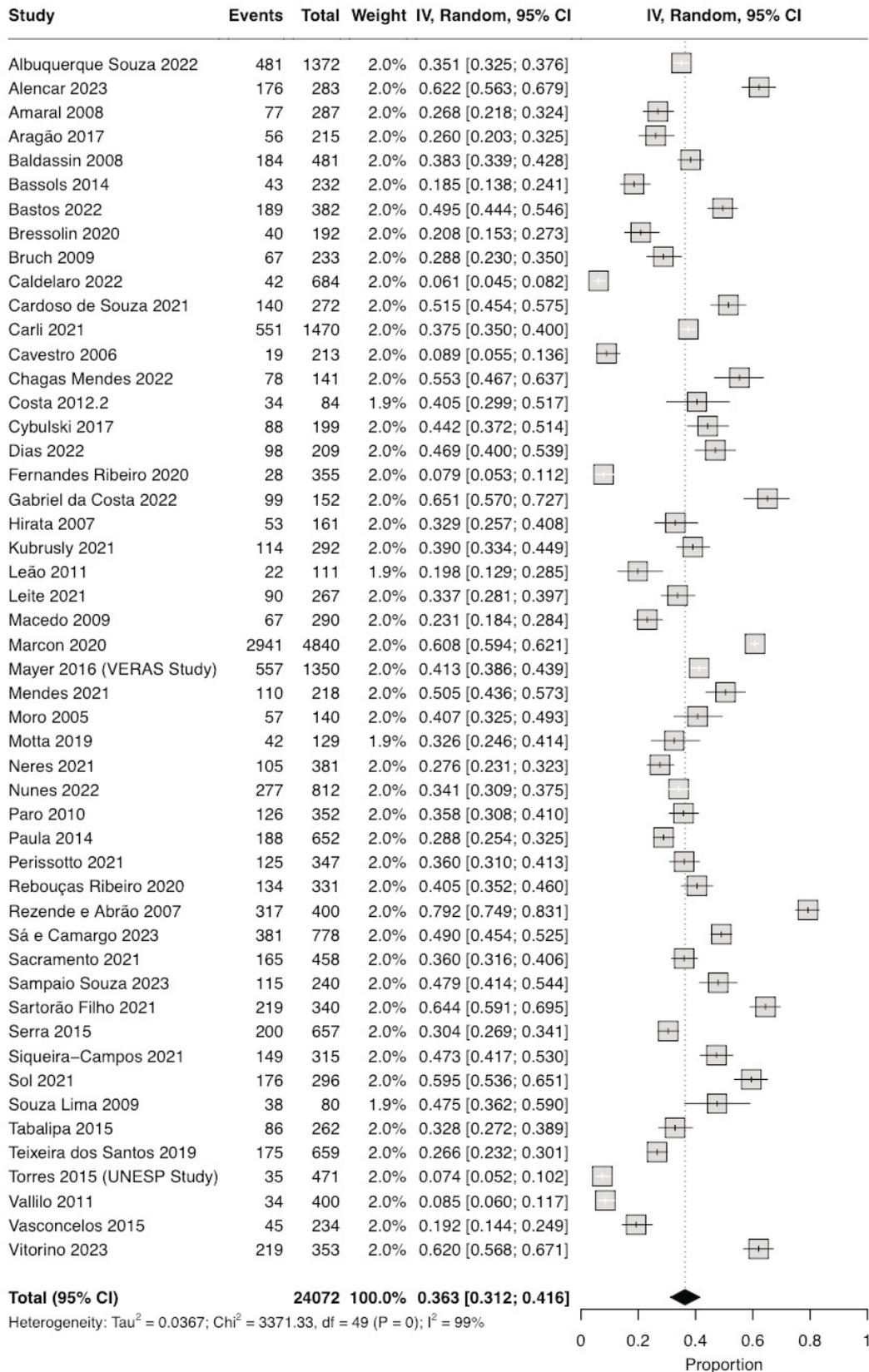
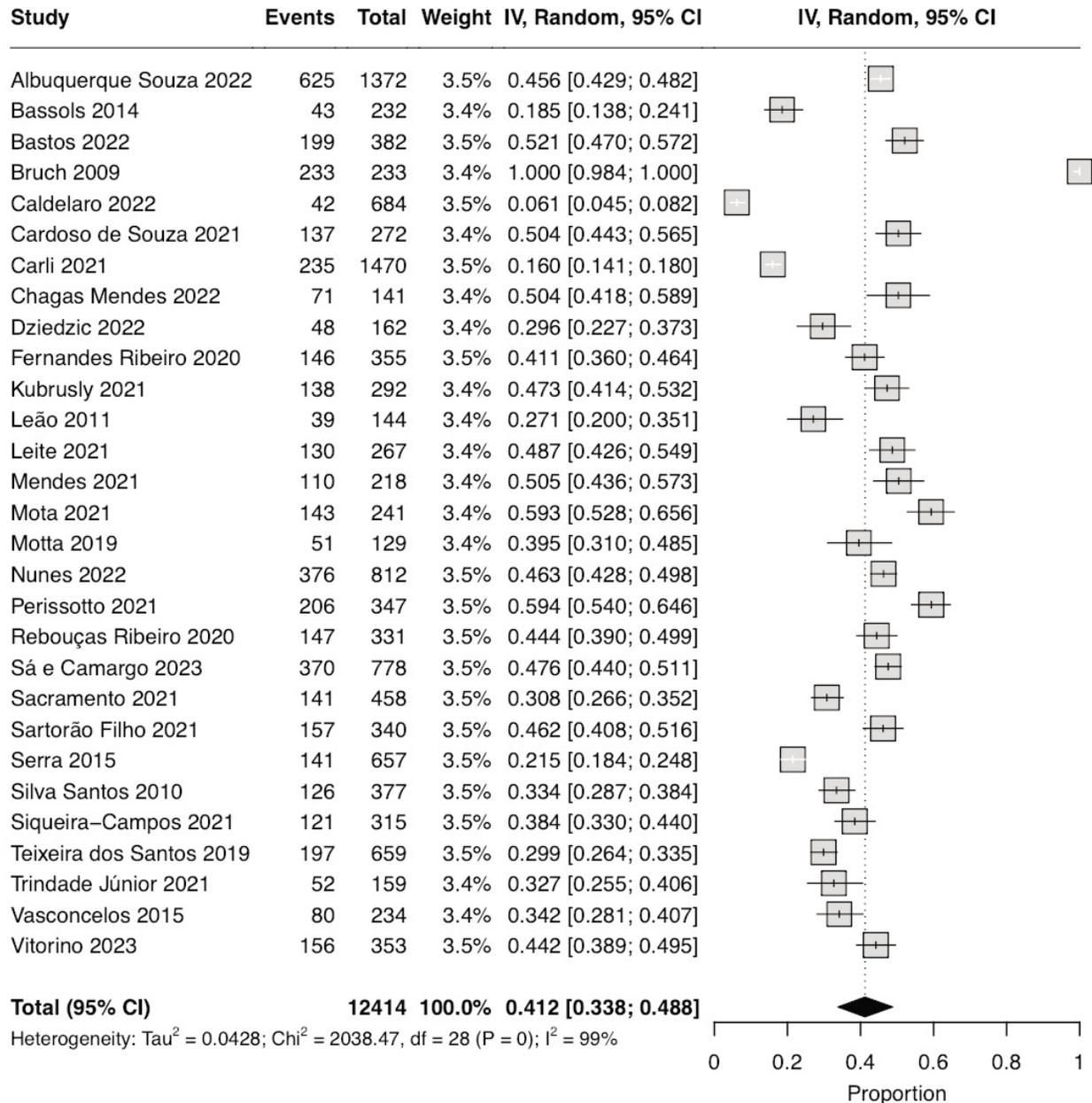


Figure 3: Pooled prevalence of anxiety symptoms among medical students in Brazil



analysis showed that the 19 pre-Covid studies (n=8,306 subjects) yielded a pooled prevalence of 40.2% (95% CI 31.0-49.8, I²=99%), compared to 43.1% (95% CI 30.3-56.4, I²=99%; p=0.73) of the 10 post-Covid studies (n=4108 subjects). Owing to the insufficient number of post-Covid-onset studies, it was not possible to perform this subgroup analysis for other MHPs.

To further assess the impact of other moderators on the prevalence rates of MHPs, meta-analyses stratified by geographic region and RoB (moderate to low RoB studies) were conducted, and the results are displayed in Table 2, respectively. Notably, it

was not possible to synthesize results for the North region for any MHP, because of an insufficient number of studies, as only two articles were identified during the literature search, each assessing a different mental health issue.

In the meta-regression analysis, we found a significant positive association between the year of data collection and the prevalence of depressive symptoms (β -coefficient=0.01, p=0.0474) and common mental disorders (β -coefficient=0.01, p=0.0002). The year of data collection for other MHPs did not significantly account for heterogeneity in prevalence estimates. The RoB

Table 1: Pooled prevalence of mental health problems among medical students in Brazil

	n of studies	Pooled prevalence (95% CI, I ²)	Male		Female	
			n of studies	Pooled prevalence (95% CI, I ²)	n of studies	Pooled prevalence (95% CI, I ²)
Common mental disorders (CMD)	22	38.7% (32.3-45.3, 97%)	12	33.5% (26.5-40.8, 91%)	12	39.1% (30.0-48.5, 96%)
Poor sleep quality	15	65.6% (58.5-72.4, 95%)	3	54.9% (22.5-85.3, 94%)	3	73.0% (37.5-96.9, 98%)
Alcohol abuse	14	31.2% (22.6-40.5, 99%)	5	39.5% (22.9-57.5, 98%)	5	27.5% (12.6-45.7, 99%)
EDS	11	54.6% (43.4-65.6, 98%)	3	35.4% (26.4-44.8, 61%)	3	57.3% (40.2-73.6, 94%)
Stress symptoms	10	42.2% (26.6-58.6, 99%)	3	38.6% (22.8-55.6, 91%)	3	51.9% (43.0-60.7, 68%)
Burnout syndrome	9	21.9% (13.6-31.5, 97%)	7	14.4% (9.9-19.6, 81%)	7	14.6% (10.6-19.1, 81%)
Suicidal ideation/risk	5	11.4% (5.6-19.0, 94%)	2	7.2% (0.4-20.0, 86%)	2	9.6% (2.5-20.7, 92%)
BSD	3	24.5% (13.5-37.6, 94%)	2	9.2% (4.9-14.6, 1%)	2	26.7% (18.1-36.2, 56%)
OCD symptoms	2	3.8% (2.3-5.5, 0%)	NA	..	NA	..
Internet addiction	2	34.1% (0.0-93.2, 100%)	NA	..	NA	..
Trait anxiety	2	34.8% (31.8-38.0, 13%)	NA	..	NA	..
State anxiety	2	35.0% (25.0-45.7, 85%)	NA	..	NA	..

NA: not available; CI: confidence interval; EDS: excessive daytime sleepiness; BSD: body shape dissatisfaction; OCD: obsessive compulsive disorder.

score also showed no association with the prevalence estimates of any MHP.

For the sensitivity analysis, we found that the pooled prevalence of each MHP was generally consistent when comparing studies that used the most frequently employed screening instrument and its most common cutoff value against the overall pooled prevalence in an Appendix available upon request to Author. As an exception, two questionnaires related to anxiety symptoms were

tied as the most commonly used across studies (i.e., the Beck Anxiety Inventory [BAI] ≥ 11 and the General Anxiety Disorder-7 ≥ 10); studies using the BAI reported a pooled prevalence of 29.5% (95% CI 14.3-47.4) compared with the overall prevalence of 41.2% (95% CI 33.8-48.8).

Discussion:

To the best of our knowledge, this is the first systematic review and meta-analysis of the prevalence of multiple MHPs among medical

Table 2: Pooled prevalence of mental health problems among medical students in Brazil, by region.

	South Prevalence (95% CI, I ² , n)	Southeast Prevalence (95% CI, I ² , n)	Center-West Prevalence (95% CI, I ² , n)	Northeast Prevalence (95% CI, I ² , n)	North Prevalence (95% CI, I ² , n)
Depression	37.0% (26.9–47.7, 95%, 8)	34.0% (26.1–42.3, 98.6%, 23)	36.8% (18.3–57.5, 96%, 2)	37.2% (33.8–40.7, 81%, 12)	NA
Anxiety	56.6% (17.0–90.0, 99%, 4)	39.2% (31.0–47.8, 97%, 14)	NA	45.3% (39.3–51.4, 91%, 6)	NA
Common mental disorders	28.4% (17.9–40.3, 96%, 5)	46.3% (35.6–57.2, 96%, 7)	NA	38.2% (32.1–44.5, 88%, 7)	NA
Poor sleep quality	68.9% (53.8–82.2, 92%, 2)	65.8% (49.8–80.2, 97%, 7)	NA	67.9% (58.3–76.7, 83%, 4)	NA
Excessive daytime sleepiness	NA	47.9% (34.6–61.3, 93%, 5)	56.5% (54.1–58.8, 0%, 2)	79.9% (20.7–97.1, 99%, 2)	NA
Alcohol abuse	31.6% (19.6–45.1, 97%, 6)	27.5% (20.4–35.3, 96%, 6)	NA	NA	NA
Stress symptoms	24.1% (2.4–58.3, 98%, 2)	59.4% (55.5–63.3, 44%, 4)	NA	46.5% (33.6–59.6, 94%, 3)	NA
Burnout syndrome	NA	52.2% (37.3–66.9, 87%, 2)	NA	16.1% (10.2–23.0, 92%, 5)	NA

CI: confidence interval; n: number of studies; NA: not available.

students in Brazil following the COVID-19 pandemic. We synthesized data from 126 studies involving 47,513 participants, providing the pooled prevalence of multiple MHPs, such as depressive symptoms (36.3%), anxiety symptoms (41.2%), burnout syndrome (21.9%), alcohol abuse (31.2%), poor sleep quality (65.6%) and others.

When studies conducted before and after the start of the COVID-19 pandemic were pooled, depression and anxiety symptoms were not significantly different in their estimated pooled prevalence among medical trainees. It is worth noting that this analysis does not assess the causal impact of the pandemic on the observed differences in prevalence. Nonetheless, there is evidence of a global rise in mental health cases during that global

health emergency, particularly from longitudinal studies, which are outside the inclusion criteria for this review. One large review estimated 53.2 million new cases of major depressive disorder and 76.2 million new cases of anxiety disorders worldwide due to COVID-19, with the most notable increase among younger individuals.⁶

In contrast, a repeated cross-sectional study evaluating mental distress in a sample of medical students in Brazil before and during the pandemic reported stable results over a three-year period.¹³⁷ This stability may be attributed to the already high levels of CMD among students prior to the pandemic, possibly resulting in a "ceiling effect", which is consistent with the already high prevalence rates of MHPs found in our review, even though crude pre/post comparisons of cross-sectional data do not assess causality. Nevertheless, a longitudinal survey of medical students in India revealed an increase in anxiety and stress levels during the pandemic, which aligns with the results from young adults in a random sample survey of the UK population in the same period.^{138,139} The differences found among studies from different countries that directly assessed the causal impact of the pandemic are likely due to variations in sample characteristics, the types of MHPs assessed, study design, and how each country managed the pandemic.

Further analyses were performed to assess the impact of other moderators. Meta-analyses of studies with lower RoB yielded prevalence rates similar to those found from synthesizing all studies, suggesting that the overall estimates are robust and not substantially influenced by study quality. We also grouped samples by Brazil's geographic macroregions. While the prevalence of some MHPs, such as depression and poor sleep quality, were consistent across regions, others like CMD and stress showed some variation. These differences may be related to other factors such as instruments used, types of institutions involved and the number of available studies in each region. This highlights the need for nationwide inquiries into medical and other undergraduate students' mental health, using unified instruments to better understand regional differences and particularities. Notably, although the North region covers almost half of the country's territory, we identified only two available studies during the literature search, each addressing a different outcome. As a result, meta-analysis was not possible for the region. This issue has also been identified in previous Brazilian reviews, due to the shortage of studies from this area.^{5,8} Thus, future

research should ensure the inclusion of samples from the North to better account for the country's full demographic diversity.

The present analysis builds on extensive evidence showing that medical trainees often exhibit high levels of MHPs. A similar review synthesizing studies from various countries reported a prevalence of 27.2% for depression and 11.1% for suicidal ideation during medical school, similar to our results of 36.3% and 11.4% for these MHPs, respectively.¹⁴⁰ These rates are notably higher than those typically reported in the general population.¹⁴¹ For instance, a large and representative mental health survey in the metropolitan region of São Paulo found that among young adults from the general public, 9.7% of participants suffered from major depressive disorder, 19.2% from any anxiety disorder and 3.5% with alcohol abuse; lower rates than those found in our review.¹⁴²

Burnout syndrome is another well-documented concern among medical students, as confirmed by the high prevalence found in the present review. A national survey of the United States population found that burnout is more prevalent among physicians, residents, and medical students than among their peers in the general population, peaking during medical school and gradually declining with each career stage.² Similarly, a Brazilian study observed that medical students exhibited poorer psychological well-being and social relationships than their age-matched controls did.³ Factors such as increased competition, lack of time for personal activities, and insecurity about their professional future have been shown to negatively impact medical students' mental health and quality of life, placing a substantial burden on their well-being.⁴

Furthermore, we found that the prevalence of depressive symptoms and CMD showed a positive increase according to the year of data collection. The other MHPs did not show any significant difference. The reasons for this increase remain unclear. This could be due to general societal changes, as evidence shows a rise in mental health issues and their burden over the past decades, which naturally affects medical students.¹⁴³ Alternatively, differences in data collection methods or diagnostic criteria over the years could also be contributing factors for the increase. Nonetheless, it is worth noting that a similar systematic review, which focused only on studies conducted after the pandemic outbreak, reported rising prevalence rates

of depression and anxiety symptoms among medical students globally.¹⁴⁴ Therefore, despite growing evidence-based interventions for treating MHPs, these appear to continue to increase in both the general population and specific groups, such as medical trainees, and external factors, such as the pandemic, likely exacerbated these issues.¹⁴³

The rates of sleep-related disturbances were the highest among the MHPs in this review, with 65.6% of students experiencing poor sleep quality and 54.6% suffering from excessive daytime sleepiness. These findings indicate that the majority of medical students in Brazil do not enjoy adequate sleep hygiene, which itself is a contributing factor to other poor mental health outcomes. One systematic review demonstrated that poor sleep and insomnia symptoms are both associated with increased stress among undergraduate students.¹⁴⁵ Furthermore, a review of randomized controlled trials revealed that improving sleep led to a significant positive effect on mental health, including reductions in depression, anxiety, stress and psychotic symptoms.¹⁴⁶ The high prevalence of sleep disturbances reported in the present review emphasizes the opportunity to address sleep hygiene in medical education as an effective way to support students' overall health.

In general, we observed that female students had higher prevalence rates of MHPs than males, except in the case of alcohol abuse. This trend was also observed in a previous review of Brazilian medical students, as female gender was significantly associated with higher rates of depression, anxiety, and stress, indicating a consistent pattern.⁵ Similar findings have also been reported in epidemiological studies of the general population and have persisted during the pandemic.^{144,147} Underlying biological, psychological, and social factors are likely contributors to this disparity, and possible explanations have been discussed previously.¹⁴⁸ Furthermore, the higher prevalence of alcohol abuse among male students found in our review is consistent with similar reports of higher rates of substance use disorders, alcohol abuse and dependence in this group.¹⁴⁸ This could be due to different social behaviors in this population, such as the use of alcohol to cope with academic stress, and greater social acceptance of drinking among males. The university setting can also play a role in problematic substance use, as students often face peer pressure to initiate or escalate consumption, and typically gain legal access to alcohol and other substances (e.g., tobacco) during this period.

However, this issue is not limited to male students, as our review also underscored a notably high frequency of alcohol abuse among female students (27.5%). Given the consistency of these findings with the available evidence, future research should explore gender differences in greater depth to develop targeted interventions for specific demographics.

Sensitivity analysis generally found consistent results when comparing the overall prevalence of MHPs with studies that used the most frequently employed screening instrument. Still, it is important to recognize that the data synthesized in this study were mostly derived from self-report instruments, which can differ in their sensitivity and specificity, depending on their intended use. For instance, studies that used the BAI compared to those that used GAD-7 found considerably lower rates of anxiety. This variability should be acknowledged when interpreting these findings, although the overall prevalences from other MHPs remained stable. Despite their limitations, self-reporting instruments are essential for clinical research on mental health as they have the advantage of being easy to administer and, importantly, allow anonymity, which is crucial for accurately identifying MHPs.¹⁴⁰

However, our review has some limitations. First, the high heterogeneity ($I^2 > 90\%$) found in most analyses indicates considerable variability between studies. Nonetheless, this is observed in the majority of proportional meta-analyses and could be attributed to differences in the year of publication, sample characteristics, and assessment tools.¹⁰ Second, the scope of this review included only cross-sectional studies, which limited our ability to infer causality and observe changes in MHPs over time. Third, some MHPs had few available studies, resulting in less robust estimates and limited generalizability for specific conditions. Fourth, the limited number of post-pandemic-onset studies constrained our ability to perform further subgroup analyses for all MHPs in this study. Fifth, we found no studies reporting the prevalence of psychotic disorders or symptoms, even though these conditions often emerge during college. This lack of data could be attributed to the fact that individuals with these conditions often leave university environments. Consequently, when a sample of university students is recruited, those with psychosis are typically underrepresented because they do not attend classes regularly. This issue likely extends to the most severe cases of the other MHPs

assessed in this review. Future research should address this gap by considering alternative recruitment strategies that include individuals who have left universities due to severe mental health conditions.

In summary, our study synthesized the available evidence estimating the prevalence of various MHPs faced by medical students in Brazil. These findings have important implications for health policy and clinical practice and may prompt future research in different areas. Policymakers and healthcare providers can use this information to prioritize health resources, as the high rates reported for various MHPs underscore the urgent need to implement targeted mental health interventions and

support systems in medical schools. Some studies have advocated that fostering students' resilience through institutional policies, such as student-centered educational approaches (e.g., active learning), incentives for extracurricular activities, and accessible counseling services, along with individual strategies like adopting problem-focused coping skills, may help improve students' mental health.^{149,150} Additionally, specific strategies may be required to address the distinct mental health needs of different demographic groups. We emphasize that without addressing these issues, we risk perpetuating mental health struggles that affect not only medical students, but also the quality of care they provide as future physicians.

References

1. Pedrelli P, Nyer M, Yeung A, Zulauf C, Wilens T. College students: Mental health problems and treatment considerations. Vol. 39, *Academic Psychiatry*. Springer Science and Business Media, LLC; 2015. p. 503–11. <https://doi.org/10.1007/s40596-014-0205-9>
2. Dyrbye LN, West CP, Satele D, Boone S, Tan L, Sloan J, et al. Burnout among u.s. medical students, residents, and early career physicians relative to the general u.s. population. *Academic Medicine*. 2014;89(3):443–51. DOI: 10.1097/ACM.0000000000000134
3. Pagnin D, De Queiroz V. Comparison of quality of life between medical students and young general populations. *Education for Health*. 2015;28(3):209–12. DOI: 10.4103/1357-6283.178599
4. Tempiski P, Bellodi PL, Paro HBMS, Enns SC, Martins MA, Schraiber LB. What do medical students think about their quality of life? A qualitative study. *BMC Medical Education*. 2012 Nov;12:106. <https://doi.org/10.1186/1472-6920-12-106>
5. Pacheco JPG, Giacomini HT, Tam WW, Ribeiro TB, Arab C, Bezerra IM, et al. Mental health problems among medical students in Brazil: a systematic review and meta-analysis. *Revista Brasileira de Psiquiatria*. 2017 Oct 1;39(4):369–78. <https://doi.org/10.1590/1516-4446-2017-2223>
6. Santomauro DF, Mantilla Herrera AM, Shadid J, Zheng P, Ashbaugh C, Pigott DM, et al. Global prevalence and burden of depressive and anxiety disorders in 204 countries and territories in 2020 due to the COVID-19 pandemic. *Lancet*. 2021;398(10312):1700–12. [https://doi.org/10.1016/S0140-6736\(21\)02143-7](https://doi.org/10.1016/S0140-6736(21)02143-7)
7. Polmann H, Domingos FL, Melo G, Stuginski-Barbosa J, Guerra EN da S, Porporatti AL, et al. Association between sleep bruxism and anxiety symptoms in adults: A systematic review. *Journal of Oral Rehabilitation*. 2019;46(5):482–91. <https://doi.org/10.1111/joor.12785>
8. Melo V, Monteiro L, Orge C, Sales M, Melo J, Rodrigues B, et al. Prevalence of temporomandibular disorders in the Brazilian population: A systematic review and meta-analysis. *Cranio - Journal of Craniomandibular & Sleep Practice* [Internet]. 2023;00(00):1–8. <https://doi.org/10.1080/08869634.2023.2276627>
9. Borenstein M. Common mistakes in meta-analysis and how to avoid them. (No Title). 2019;

10. Barker TH, Migliavaca CB, Stein C, Colpani V, Falavigna M, Aromataris E, et al. Conducting proportional meta-analysis in different types of systematic reviews: a guide for synthesisers of evidence. *BMC Medical Research Methodology*. 2021;21(1):1–9. <https://doi.org/10.1186/s12874-021-01381-z>
11. Aguiar SM, Vieira APGF, Vieira KMF, Aguiar SM, Nóbrega JO. Prevalência de sintomas de estresse nos estudantes de medicina. *Jornal Brasileiro de Psiquiatria*. 2009;58(1):34–8. <https://doi.org/10.1590/S0047-20852009000100005>
12. Alberton VC, Dal-Bó MJ, Piovezan AP, Silva RM da. Abnormal eating behaviors among medical students at a university in southern Santa Catarina, Brazil. *Revista Brasileira de Educação Médica*. 2013;37(01):15–20. <https://doi.org/10.1590/S0100-55022013000100003>
13. Amaral GF do, Gomide LM de P, Batista M de P, Pícolo P de P, Teles TBG, Oliveira PM de, et al. Sintomas depressivos em acadêmicos de medicina da Universidade Federal de Goiás: Um estudo de prevalência. *Revista de Psiquiatria do Rio Grande do Sul*. 2008;30(2):124–30. <https://doi.org/10.1590/S0101-81082008000300008>
14. Amorim A, Kikko E, Abrantes M, Andrade V. Álcool e alcoolismo : estudo de prevalência entre discentes do curso de Medicina da UNIFENAS em Belo Horizonte – Minas Gerais. *Revista Médica Minas Gerais*. 2008;18(1):16–23.
15. Amorim T, Amorim M. Evaluation of alcohol addiction among Brazilian Northeast medical students through the alcohol use disorders identification test and the relation with body mass. *Revista Brasileira Clínica Médica São Paulo* [Internet]. 2012;10(5):398–401.
16. Aragão JA, Freire MR de M, Nolasco Farias LG, Diniz SS, Sant’anna Aragão FM, Sant’anna Aragão IC, et al. Prevalence of depressive symptoms among medical students taught using problem-based learning versus traditional methods. *International Journal of Psychiatry in Clinical Practice* [Internet]. 2018;22(2):123–8. <https://doi.org/10.1080/13651501.2017.1383438>
17. Rocha LA, Lopes ACFMM, Martelli DRB, Lima VB, Martelli-Júnior H. Consumo de álcool entre estudantes de faculdades de Medicina de Minas Gerais, Brasil. *Revista Brasileira Educação Médica*. 2011;35(3):369–75. <https://doi.org/10.1590/S0100-55022011000300010>
18. Baldisserotto CM, Filho ES, Nedel F, Sakae TM. Problemas psiquiátricos menores e indicadores do uso problemático de álcool entre os estudantes de medicina da Universidade do Sul de Santa Catarina - UNISUL. *Arquivos Catarinenses de Medicina*. 2005;34(4):73–9.
19. Barbosa ML, Ferreira BLR, Vargas TN, Ney da Silva GM, Nardi AE, Machado S, et al. Burnout Prevalence and Associated Factors Among Brazilian Medical Students. *Clinical Practice and Epidemiology in Mental Health*. 2018;14(1):188–95. <https://doi.org/10.2174/1745017901814010188>
20. Bassols AM, Okabayashi LS, Silva AB da, Carneiro BB, Feijó F, Guimarães GC, et al. First- and last-year medical students: is there a difference in the prevalence and intensity of anxiety and depressive symptoms? *Revista Brasileira de Psiquiatria*. 2014 Sep;36(3):233–40. <https://doi.org/10.1590/1516-4446-2013-1183>
21. Bassols AMS, Carneiro BB, Guimarães GC, Okabayashi LMS, Carvalho FG, da Silva AB, et al. Stress and coping in a sample of medical students in Brazil. *Archives of Clinical Psychiatry*. 2015;42(1):1–5. <https://doi.org/10.1590/0101-608300000000038>
22. Bastos TM, Bumaguin DB, Astolfi VR, Xavier AZ, Hoffmann MS, Ornell F, et al. Mental health help-seeking among Brazilian medical students: Who suffers unassisted? *International Journal of Social Psychiatry*. 2022 Sep;68(6):1203–12. <https://doi.org/10.1177/00207640221082930>
23. Dos Santos Boni RA, Paiva CE, De Oliveira MA, Lucchetti G, Fregnani JHTG, Paiva BSR. Burnout

among medical students during the first years of undergraduate school: Prevalence and associated factors. *PLoS One*. 2018;13(3):1–15. <https://doi.org/10.1371/journal.pone.0191746>

24. Bresolin JZ, Dalmolin G de L, Vasconcellos SJL, Barlem ELD, Andolhe R, Magnago TSB de S. Depressive symptoms among healthcare undergraduate students. *Revista Latina Americana de Enfermagem*. 2020;28:e3239. <https://doi.org/10.1590/1518-8345.3210.3239>

25. Bruch TP, Carneiro EA, Jornada LK. Presença de sintomas psiquiátricos em estudantes de medicina de Universidade do sul do Brasil. *ACM Arquivos Catarinenses de Medicina* [Internet]. 2009;38(4).

26. Cunha MAB, Neves AA de F, Moreira ME, Hehn FJ, Lopes TP, Ribeiro CCF, et al. Transtornos psiquiátricos menores e procura por cuidados em estudantes de Medicina. *Revista Brasileira de Educação Médica*. 2009;33(3):321–8. <https://doi.org/10.1590/S0100-55022009000300002>

27. Campos Silva S, Ferreira Romão M. Avaliação Da Qualidade Do Sono Dos Acadêmicos De Medicina Do Método De Aprendizagem Baseada Em Problemas. *Revista Brasileira de Neurologia e Psiquiatria* [Internet]. 2017;21(3):185–96.

28. Carli TC, Ribeiro AP, Oliveira GL. Perceived quality of life among Brazilian medical students: initial findings from a follow-up study. *Psychology, Health & Medicine* [Internet]. 2022;27(7):1544–52. Available from: <https://doi.org/10.1080/13548506.2021.1898650>

29. Almeida G de C, Souza HR de, Almeida PC de, Almeida B de C, Almeida GH. The prevalence of burnout syndrome in medical students. *Revista de Psiquiatria Clínica*. 2016;43(1):6–10. <https://doi.org/10.1590/0101-60830000000072>

30. Cavestro JDM, Rocha FL. Prevalência de depressão entre estudantes universitários. *Jornal Brasileiro de Psiquiatria*. 2006;55(4):264–7. <https://doi.org/10.1590/S0047-20852006000400001>

31. Chaves EP, Ximenes TMB, Rocha PB de C, Kubrusly M, Peixoto RAC, Peixoto Junior AA. Use of hypnotics, sleep quality and Burnout syndrome in medical students. SMAD, *Revista Eletrônica Saúde Mental Alcool e Drogas* (Edição em Port. 2021;17(4):74–82. <https://doi.org/10.11606/issn.1806-6976.smad.2021.176488>

32. Corrêa C de C, Oliveira FK de, Pizzamiglio DS, Ortolan EVP, Weber SAT. Sleep quality in medical students: a comparison across the various phases of the medical course. *Jornal Brasileiro de Pneumologia*. 2017;43(4):285–9. <https://doi.org/10.1590/S1806-37562016000000178>

33. Costa EFDO, De Andrade TM, Neto AMS, De Melo EV, Rosa ACA, Alencar MA, et al. Common mental disorders among medical students at Universidade Federal de Sergipe: A cross-sectional study. *Revista Brasileira de Psiquiatria*. 2010;32(1):11–9. <https://doi.org/10.1590/S1516-44462010000100005>

34. Costa EF de O, Santos SA, Santos ATR de A, Melo EV de, Andrade TM de. Burnout Syndrome and associated factors among medical students: a cross-sectional study. *Clinics (Sao Paulo)*. 2012;67(6):573–80. [https://doi.org/10.6061/clinics/2012\(06\)05](https://doi.org/10.6061/clinics/2012(06)05)

35. Cost EF de O, Santana YS, Santos ATR de A, Martins LAN, de Melo EV, de Andrade TM. Depressive symptoms among medical intern students in a brazilian public university. *Revista da Associação Médica Brasileira*. 2012;58(1):53–9. <https://doi.org/10.1590/S0104-42302012000100015>

36. De Oliva Costa EF, Rocha MMV, De Abreu Santos ATR, De Melo EV, Martins LAN, Andrade TM. Common mental disorders and associated factors among final-year healthcare students. *Revista da Associação Médica Brasileira*. 2014;60(6):525–30. <https://doi.org/10.1590/1806-9282.60.06.009>

37. Silva RC, Pereira AA, Moura EP. Quality of Life and Minor Mental Disorders of the Medical Students at the University Center of Caratinga (UNEC) - Minas Gerais. *Revista Brasileira de Educação Médica*.

2020;44(2):e064–e064. <https://doi.org/10.1590/1981-5271v44.2-20190179>

38. Cunha CM, Fortes DA, Scapim JPR, Santos KOB, Fernandes R de CP. Common mental disorders in medical students: prevalence and associated factors. *Revista Brasileira de Educação Médica*. 2023;47(4). <https://doi.org/10.1590/1981-5271v47.4-2022-0307.ING>
39. Cybulski CA, Mansani FP. Análise da Depressão, dos Fatores de Risco para Sintomas Depressivos e do Uso de Antidepressivos entre Acadêmicos do Curso de Medicina da Universidade Estadual de Ponta Grossa. *Revista Brasileira de Educação Médica*. 2017;41(1):92–101. <https://doi.org/10.1590/1981-52712015v41n1RB20160034>
40. Pietro M Di, Xavier D. Internal validity , dimensionality and performance of the Body Shape Questionnaire in a group of Brazilian college students. *Revista Brasileira de Psiquiatria*. 2008;31(1):21–4. <https://doi.org/10.1590/S1516-44462008005000017>
41. Dias AR, Fernandes SM, Fialho-Silva I, Cerqueira-Silva T, Miranda-Scippa Â, Almeida AG. Burnout syndrome and resilience in medical students from a Brazilian public college in Salvador, Brazil. *Trends in Psychiatry and Psychotherapy*. 2022 Jun;44:e20200187. <https://doi.org/10.47626/2237-6089-2020-0187>
42. Dutra da Silva RC, Garcez A, Pattussi MP, Olinto MTA. Prevalence and factors associated with excessive and severe daytime sleepiness among healthcare university students in the Brazilian Midwest. *Journal of Sleep Research*. 2022;31(3):1–10. <https://doi.org/10.1111/jsr.13524>
43. Facundes VLD, Ludermir AB. Common mental disorders among health care students. *Revista Brasileira de Psiquiatria*. 2005;27(3):194–200. <https://doi.org/10.1590/S1516-44462005000300007>
44. Ribeiro CF, Lemos CMC, Alt NN, Marins RLT, Corbiceiro WCH, Nascimento MI do. Prevalence of and Factors Associated with Depression and Anxiety in Brazilian Medical Students. *Revista Brasileira de Educação Médica* [Internet]. 2020;44(1):e021–e021. <https://doi.org/10.1590/1981-5271v44.1-20190102.ING>
45. Fiorotti KP, Rossoni RR, Borges LH, Miranda AE. Transtornos mentais comuns entre os estudantes do curso de medicina: Prevalência e fatores associados. *Jornal Brasileiro de Psiquiatria*. 2010;59(1):17–23. <https://doi.org/10.1590/S0047-20852010000100003>
46. Fontana MCP, Generoso IP, Sizilio A, Bivanco-Lima D. Burnout syndrome, extracurricular activities and social support among Brazilian internship medical students: a cross-sectional analysis. *BMC Medical Education*. 2020 Mar;20(1):81. <https://doi.org/10.1186/s12909-020-01998-6>
47. Furtado EDS, Falcone EMDO, Clark C. Avaliação do estresse e das habilidades sociais na experiência acadêmica de estudantes de medicina de uma universidade do Rio de Janeiro. *Interação em Psicologia*. 2003;7(2):43–51. <https://doi.org/10.5380/psi.v7i2.3222>
48. da Costa TG, Simon L, Mocellin LP, Wottrich SH, Pase CS. Prevalence and factors associated with depression and anxiety among medical students in an inland university in Brazil. *Medicina*. 2022;55(4). <https://doi.org/10.11606/issn.2176-7262.rmrp.2022.196142>
49. von Gaevernitz Lima D, Kluthcovsky ACGC, Fernandes LGR, Okarenski G. Quality of sleep and use of computers and cellphones among university students. *Revista da Associação Médica Brasileira*. 2019;65(12):1454–8. <https://doi.org/10.1590/1806-9282.65.12.1454>
50. Grether EO, Becker MC, Menezes HM, Nunes CR de O. Prevalência de Transtornos Mentais Comuns entre Estudantes de Medicina da Universidade Regional de Blumenau (SC). *Revista Brasileira de Educação Médica*. 2019;43(1 suppl 1):276–85. <https://doi.org/10.1590/1981-5271v43suplemento1-20180260>

51. Hidalgo MP, Caumo W. Sleep disturbances associated with minor psychiatric disorders in medical students. *Neurological Sciences* [Internet]. 2002;23(1):35–9. <https://doi.org/10.1007/s100720200021>
52. Hirata FC, Lima MCO, de Bruin VMS, Nóbrega PR, Wenceslau GP, de Bruin PFC. Depression in medical school: the influence of morningness-eveningness. *Chronobiology International*. 2007;24(5):939–46. <https://doi.org/10.1080/07420520701657730>
53. Kintschev MR, Shimada SS, Silva MO da, Barros YV de, Hoffmann-Santos HD. Chronotype change in university students in the health area with excessive daytime sleepiness. *Revista Brasileira de Educação Médica*. 2021;45(1):1–9. <https://doi.org/10.1590/1981-5271v45.1-20200271.ING>
54. Kubrusly M, Silva PG de B, Vasconcelos GV de, Leite EDLG, Santos P de A, Rocha HAL. Nomophobia among medical students and its association with depression, anxiety, stress and academic performance. *Revista Brasileira de Educação Médica*. 2021;45(3):3–10. <https://doi.org/10.1590/1981-5271v45.3-20200493.ING>
55. de Oliveira e Sousa Leão PB, Martins LANER, Menezes PR, Bellodi PL. Bem-Estar e busca de ajuda: Um estudo exploratório entre alunos de Medicina ao final curso. *Revista da Associação Médica Brasileira*. 2011;57(4):379–86. <https://doi.org/10.1590/S0104-42302011000400009>
56. Leite LC, Dornelas LV, Secchin L de SB. Influence of religiosity on medical students' mental health. *Revista Brasileira de Educação Médica*. 2021;45(2). <https://doi.org/10.1590/1981-5271v45.2-20200446.ING>
57. Lima MCP, de Souza Domingues M, de Abreu Ramos Cerqueira AT. Prevalência e fatores de risco para transtornos mentais comuns entre estudantes de medicina. *Revista de Saude Publica*. 2006;40(6):1035–41. <https://doi.org/10.1590/S0034-89102006000700011>
58. Maria Paz Loayza H, Ponte TS, Carvalho CG, Pedrotti MR, Nunes P V., Souza CM, et al. Association between mental health screening by self-report questionnaire and insomnia in medical students. *Arquivos de Neuropsiquiatria*. 2001;59(2 A):180–5. <https://doi.org/10.1590/S0004-282X2001000200005>
59. Loredó e Silva MP, de Souza Matos BD, da Silva Ezequiel O, Lucchetti ALG, Lucchetti G. The Use of Smartphones in Different Phases of Medical School and its Relationship to Internet Addiction and Learning Approaches. *Journal of Medical Systems*. 2018;42(6):8–12. <https://doi.org/10.1007/s10916-018-0958-x>
60. Macedo PNAG, Nardotto LL, Dieckmann LHJ, Ferreira YD, Macedo BAG, Santos MAP dos, et al. Factors associated with depressive symptoms in a sample of Brazilian medical students. *Revista Brasileira de Educação Médica*. 2009;33(04):595–604. <https://doi.org/10.1590/S0100-55022009000400010>
61. Marcon G, Massaro Carneiro Monteiro G, Ballester P, Cassidy RM, Zimmerman A, Brunoni AR, et al. Who attempts suicide among medical students? *Acta Psychiatrica Scandinavica*. 2020 Mar;141(3):254–64. <https://doi.org/10.1111/acps.13137>
62. Marcon G, de Ávila Pereira F, Zimmerman A, da Silva BC, von Diemen L, Passos IC, et al. Patterns of high-risk drinking among medical students: A web-based survey with machine learning. *Computers in Biology and Medicine*. 2021 Sep;136:104747. <https://doi.org/10.1016/j.compbiomed.2021.104747>
63. Marin CE, Feldens VP, Sakae TM. Dependência de Internet, qualidade do sono e sonolência em estudantes de Medicina de Universidade do Sul do Brasil. *Revista da AMRIGS*. 2016;60(3):191–7.
64. Souza FG de M e, Menezes M da GC. Estresse nos Estudantes de Medicina da Universidade Federal do Ceará. Vol. 29, *Revista Brasileira de Educação Médica*. 2005. p. 91–6. <https://doi.org/10.1590/1981-5271v29.2-014>

65. Mattos P, Nazar BP, Tannock R. By the book: ADHD prevalence in medical students varies with analogous methods of addressing DSM items. *Revista Brasileira de Psiquiatria*. 2018;40(4):382–7. <https://doi.org/10.1590/1516-4446-2017-2429>
66. Brenneisen Mayer F, Souza Santos I, Silveira PSP, Itaquí Lopes MH, De Souza ARND, Campos EP, et al. Factors associated to depression and anxiety in medical students: a multicenter study. *BMC Medical Education* [Internet]. 2016;16(1):1–9. <http://dx.doi.org/10.1186/s12909-016-0791-1>
67. Medeiros ALD, Mendes DBF, Lima PF, Araujo JF. The relationships between sleep-wake cycle and academic performance in medical students. *Biological Rhythm Research*. 2001;32(2):263–70. <https://doi.org/10.1076/brhm.32.2.263.1359>
68. Moraes CAT, Edelmuth DGL, Novo NF, Hübner CVK. Qualidade de sono em estudantes de medicina do método de aprendizado baseado em problemas. *Medicina*. 2013;46(4):289–97. <https://doi.org/10.11606/issn.2176-7262.v46i4p389-397>
69. Morais BX, Dalmolin G de L, Pedro CMP, Bresolin JZ, Andolhe R, Magnago TSB de S. Perceived stress and musculoskeletal pain among undergraduate health students. *Texto Contexto*. 2021;30:e20200076. <https://doi.org/10.1590/1980-265X-TCE-2020-0076>
70. Moro A, Valle JB do, Lima LP de. Sintomas Depressivos nos Estudantes de Medicina da Universidade da Região de Joinville (SC). Vol. 29, *Revista Brasileira de Educação Médica*. 2005. p. 97–102. <https://doi.org/10.1590/1981-5271v29.2-015>
71. Motta IC de M, Soares R de CM, Belmonte T de SA. Uma Investigação sobre Disfunções Familiares em Estudantes de Medicina TT - An investigation into Familiar Dysfunctions among Medical Students. *Revista Brasileira de Educação Médica* [Internet]. <https://doi.org/10.1590/1981-5271v43suplemento1-20180276>
72. Almeida ADM, Godinho TM, Bitencourt AG V, Teles MS, Silva AS, Fonseca DC, et al. Common mental disorders among medical students. *Jornal Brasileiro de Psiquiatria* [Internet]. 2007;56(4):245–51. <https://doi.org/10.1590/S0047-20852007000400002>
73. Neres BSP, Aquino MLA, Pedroso VSP. Prevalence and factors associated to depression and suicidal behavior among medical students. *Jornal Brasileiro de Psiquiatria*. 2021;70(4):311–20. <https://doi.org/10.1590/0047-2085000000351>
74. Nicoli MG, Junior RDRL. Binge Eating Disorder and body image perception among university students. *Eating Behaviours* [Internet]. 2011;12(4):284–8. <http://dx.doi.org/10.1016/j.eatbeh.2011.07.004>
75. Nunes JKVRS, Figueiredo VM e S de, Santos JVS, Mendes NML da S, Figueiredo Neto JA de. Ansiedade e depressão em estudantes de medicina: estudo transversal. *Revista de Medicina*. 2022;101(6):1–8. <https://doi.org/10.11606/issn.1679-9836.v101i6e-195874>
76. Oliveira ACP de M, Machado APGM, Aranha RNM. Identification of factors associated with resilience in medical students through a cross-sectional census. *BMJ Open*. 2017 Nov;7(11):e017189. <https://doi.org/10.1136/bmjopen-2017-017189>
77. Pagnin D, de Queiroz V, Carvalho YTMS, Dutra ASS, Amaral MB, Queiroz TT. The relation between burnout and sleep disorders in medical students. *Academic psychiatry*. 2014 Aug;38(4):438–44. <https://doi.org/10.1007/s40596-014-0093-z>
78. Paro HBMS, Morales NMO, Silva CHM, Rezende CHA, Pinto RMC, Morales RR, et al. Health-related quality of life of medical students. *Medical Education*. 2010;44(3):227–35. <https://doi.org/10.1111/j.1365-2923.2009.03587.x>

79. Lambert Passos SR, Alvarenga Americano do Brasil PE, Borges dos Santos MA, Costa de Aquino MT. Prevalence of psychoactive drug use among medical students in Rio de Janeiro. *Social Psychiatry and Psychiatric Epidemiology*. 2006;41(12):989–96. <https://doi.org/10.1007/s00127-006-0114-7>
80. de Paula JDA, Borges AMFS, Bezerra LRA, Parente H V, de Paula RCA, Wajnsztein R, et al. Prevalence and factors associated with depression in medical students. *Journal of Human Growth and Development* [Internet]. 2014;24(3):274–81. <https://doi.org/10.7322/jhgd.88911>
81. Pelicioli M, Barelli C, Gonçalves CBC, Hahn SR, Scherer JI. Perfil do consumo de álcool e prática do beber pesado episódico entre universitários brasileiros da área da saúde. *Jornal Brasileiro de Psiquiatria* [Internet]. 2017;66(3):150–6. <https://doi.org/10.1590/0047-2085000000164>
82. Perotta B, Arantes-Costa FM, Enns SC, Figueiro-Filho EA, Paro H, Santos IS, et al. Sleepiness, sleep deprivation, quality of life, mental symptoms and perception of academic environment in medical students. *BMC Medical Education*. 2021 Feb;21(1):111. <https://doi.org/10.1186/s12909-021-02544-8>
83. Prata TSC, Calcides DAP, Vasconcelos EL, Carvalho AA, de Melo EV, de Oliva-Costa EF. Prevalence of burnout syndrome and associated factors in medical students under different educational models. *Revista da Associação Médica Brasileira*. 2021;67(5):667–74. <https://doi.org/10.1590/1806-9282.20200937>
84. Vieira Queiroz de Almeida F, Tarlane Soares Silva B, das Graças Oliveira Paiva B, Beatriz Montina C, Almeida Araújo Basso D, Medeiros de Azevedo N, et al. Influence of sleep quality on medical students' academic performance. Influência da qualidade do sono no desempenho acadêmico de estudantes de medicina. *Revista Sociedade Brasileira de Clínica Médica*. 2021;19(3):165–74.
85. Abrão CB, Coelho EP, Passos LB da S. Prevalência de sintomas depressivos entre estudantes de medicina da Universidade Federal de Uberlândia. *Revista Brasileira de Educação Médica*. 2008;32:315–23. <https://doi.org/10.1590/S0100-55022008000300006>
86. Ribas E de O, Wassano DI, dos Santos BB, Pereira FS, Perotta B, Mousfi AKJ. Prevalência de transtornos mentais comuns em estudantes de medicina da Faculdade Evangélica do Paraná em 2011. *Revista Médica do Paraná*. 2017;62–6.
87. Rocha ES, Sassi AP. Transtornos mentais menores entre estudantes de medicina. *Revista Brasileira de Educação Médica*. 2013;37(2):210–6. <https://doi.org/10.1590/s0100-55022013000200008>
88. Sousa AR, Dos Reis DM, de Vasconcelos TM, Abdon APV, Machado SP, Bezerra IN. Association between common mental disorders and dietary intake among university students doing health-related courses. *Ciencia e Saude Coletiva*. 2021;26(9):4145–52. <https://doi.org/10.1590/1413-81232021269.07172020>
89. de Sá e Camargo ML, Torres RV, Cotta KCG, Ezequiel O da S, Lucchetti G, Lucchetti ALG. Mental health throughout the medical career: A comparison of depression, anxiety, and stress levels among medical students, residents, and physicians. *The International Journal of Social Psychiatry*. 2023;69(5):1260–7. <https://doi.org/10.1177/00207640231157258>
90. Sacramento BO, Anjos TL dos, Barbosa AGL, Tavares CF, Dias JP. Symptoms of anxiety and depression among medical students: study of prevalence and associated factors. *Revista Brasileira de Educação Médica*. 2021;45(1):1–7. <https://doi.org/10.1590/1981-5271v45.1-20200394.ING>
91. Souza AS, Fontoura GMG, Bedin BL, Nunes LI da S, Lima EVC de, Gama JAG. Prevalência e fatores associados a sintomas depressivos em estudantes de Medicina no município de Imperatriz, Maranhão. *Saúde (Santa Maria)*. 2024;49(2):e67245. <https://doi.org/10.5902/2236583467245>
92. Schwarzbald ML, Haas GM, Barni RS, Biava P, Momo AC, Dias TM, et al. At-risk drinking and current

- cannabis use among medical students: A multivariable analysis of the role of personality traits. *Brazilian Journal of Psychiatry* [Internet]. 2020;42(2):136–44. <https://doi.org/10.1590/1516-4446-2018-0318>
93. Segundo LVG, Cavalcanti Neto BF, Paz DDA, De Almeida Holanda MM. Aspectos relacionados à qualidade do sono em estudantes de medicina. *Revista Brasileira de Neurologia e Psiquiatria*. 2017;21(3):213–23.
94. Serra RD, e Dinato SLM, Caseiro MM. Prevalence of depressive and anxiety symptoms in medical students in the city of Santos. *Jornal Brasileiro de Psiquiatria* [Internet]. 2015;64(3):213–20. <https://doi.org/10.1590/0047-2085000000081>
95. Santos LAS, Sandin GR, Sakae TM. Associação de cefaleia e ansiedade em estudantes de Medicina de uma universidade do sul de Santa Catarina. *Revista da AMRIGS*. 2010;54(3):288–93.
96. Silveira R da R, Lejderman B, Ferreira PEMS, da Rocha GMP. Padrões do uso não médico de metilfenidato em estudantes do 5º e do 6º ano de uma faculdade de medicina do Brasil. *Trends Psychiatry Psychotherapy*. 2014;36(2):101–6. <https://doi.org/10.1590/2237-6089-2013-0065>
97. Siqueira-Campos VM, De Deus MSC, Carneiro LA, Naghettini AV, Pereira MAD, De Deus JM, et al. Dysfunctional Parenting Styles Are Associated with Mental Disorders and Low Self-Efficacy Beliefs in Brazilian Undergraduate Medical Students. *Biomed Research International*. 2021;2021:6372922. <https://doi.org/10.1155/2021/6372922>
98. Sol ÉGL, Junior AC, Abelha L, Lovisi GM, Brasil MAA. Assessment of suicidal behavior in medical students. *Jornal Brasileiro de Psiquiatria*. 2022;71(2):83–91. <https://doi.org/10.1590/0047-2085000000343>
99. Lima L de S, Ferry V, Fonseca RNM, Silva Junior GF, Jidão FR de S. Sintomas depressivos nos estudantes de medicina da universidade estadual do Maranhão. *Revista Neurociencias*. 2013;21(1):8–12.
100. De Souza Neta AM, Fink Santos Neves JPD, Barreto ÍD de C, Freitas Trindade LMD. Medical and Law Graduates and their sleep disorders: Daytime oversleep and Risk Factors. *Journal of Health and Biological Sciences*. 2018;6(4):364–70. <https://doi.org/10.12662/2317-3076jhbs.v6i4.2062.p364-370.2018>
101. Tabalipa F de O, Souza MF de, Pfützenreuter G, Lima VC, Traebert E, Traebert J. Prevalence of Anxiety and Depression among Medical Students. *Revista Brasileira de Educação Médica*. 2015;39(3):388–94.
102. dos Santos DT, Nazário FP, Freitas RA, Henriques VM, de Paiva IS. Alcohol abuse and dependence among Brazilian medical students: Association to sociodemographic variables, anxiety and depression. *Journal of Substance Use* [Internet]. 2019;24(3):285–92 <https://doi.org/10.1080/14659891.2018.1562574>
103. Tempski P, Santos IS, Mayer FB, Enns SC, Perotta B, Paro HBMS, et al. Relationship among Medical Student Resilience, Educational Environment and Quality of Life. *PLoS One*. 2015;10(6):e0131535. <https://doi.org/10.1371/journal.pone.0131535>
104. Torres AR, Cruz BL, Vicentini HC, Lima MCP, Ramos-Cerqueira ATA. Obsessive-Compulsive Symptoms in Medical Students: Prevalence, Severity, and Correlates. *Academic Psychiatry*. 2016;40(1):46–54. <https://doi.org/10.1007/s40596-015-0357-2>
105. Torres AR, Campos LM, Lima MCP, Ramos-Cerqueira ATA. Suicidal Ideation Among Medical Students. *Journal of Nervous and Mental Disease*. 2018;206(3):160–8. <https://doi.org/10.1097/NMD.0000000000000734>
106. Trindade Júnior SC, Sousa LFF de, Carreira LB. Generalized anxiety disorder and prevalence of suicide risk among medical students. *Revista Brasileira de Educação Médica*. 2021;45(2):1–7. <https://doi.org/10.1590/1981-5271v45.2-20200043.ING>

107. Vallilo NG, Júnior RD, Gobbo R, Novo NF, Hübner CVK. Prevalência de sintomas depressivos em estudantes de Medicina. *Revista Brasileira de Clínica Médica*. 2011;9(1):36–41. <https://www.sbcm.org.br/revistas/RBCM/RBCM-2011-01.pdf#page=33>
108. Vasconcelos TC de, Dias BRT, Andrade LR, Melo GF, Barbosa L, Souza E. Prevalência de Sintomas de Ansiedade e Depressão em Estudantes de Medicina [Internet]. *Revista Brasileira de Educação Médica* 2015;39(1):135–42. <https://doi.org/10.1590/1981-52712015v39n1e00042014>
109. Felipe Vencato da Silva, Eurípedes Gomes de Carvalho Neto, Lauditoni Pereira Chaves Junior, Dkaion Vilela de Jesus, Milton Vilar Ferreira Dantas AJ da F. Screening for Depersonalization / Derealization Disorder among Medical Students at a Brazilian Public University. *Revista Brasileira de Educação Médica*. 2016;40(3):337–43. <https://doi.org/10.1590/1981-52712015v40n3e01102015>
110. Vitorino LM, Lucchetti G, Saba IF, Nalon JMMCA, de Faria RS, Trzesniak C. The role of spirituality and religiosity on the suicidal ideation of medical students. *International Journal of Social Psychiatry*. 2023 Aug;69(5):1185–92. <https://doi.org/10.1177/00207640231153497>
111. Volcan SMA, Sousa PLR, Mari J de J, Horta BL. Relação entre bem-estar espiritual e transtornos psiquiátricos menores: estudo transversal. *Revista de Saude Publica*. 2003;37(4):440–5. <https://doi.org/10.1590/S0034-89102003000400008>
112. Baldassin S, Alves TC de TF, de Andrade AG, Nogueira Martins LA. The characteristics of depressive symptoms in medical students during medical education and training: a cross-sectional study. *BMC Medical Education*. 2008 Dec;8:60. <https://doi.org/10.1186/1472-6920-8-60>
113. Souza GF de A, Souza GF de A, Alves AC de S, Cordeiro ALN, Carvalho M de SO, Costa GOLP da, et al. Fatores associados à ansiedade/depressão nos estudantes de Medicina durante distanciamento social devido à Covid-19. *Revista Brasileira de Educação Médica*. 2022;46(3):1–14. <https://doi.org/10.1590/1981-5271v46.3-20220042>
114. Alencar MS, Kubrusly M, Aquino BOA de, Viana IN, Morais PI, Rocha HAL. Depression among Brazilian medical students exposed to remote learning and the role of scopophobia. *Medical Teacher*. 2023 Jul;1–8. <https://doi.org/10.1080/0142159X.2023.2236779>
115. Arar FC, Chaves T de F, Turci MA, Moura EP. Quality of life and mental health of medical students in the Covid-19 pandemic. *Revista Brasileira de Educação Médica* [Internet]. 2023;47(1):e040. <https://doi.org/10.1590/1981-5271v47.1-20220200.ING>
116. da Silva Beltrame KW, Trindade-Suedam IK, Trindade SHK, Marzano-Rodrigues MN. Web survey during COVID-19 pandemic in São Paulo state: how are medical students sleeping and living? *Sleep Science*. 2022;15(4):374–82. <https://doi.org/10.5935/1984-0063.20220066>
117. Calderaro DC, Teodoro MLM, Basualto S, Borges AR, Lopes JVZ, Araújo NC, et al. Participating as a research team during the COVID-19 pandemic benefits mental health of undergraduate medical students in Brazil. *Psychology, Health & Medicine*. 2023 Jul;28(6):1441–9. <https://doi.org/10.1080/13548506.2022.2141280>
118. Caroline Cavalcante Cardoso A, Larissa Almeida de Oliveira Barbosa iD, Luiz Fernando Quintanilha iD, Kátia de Miranda Avena iD. Prevalência de transtornos mentais comuns entre estudantes de Medicina durante a pandemia de Covid-19. *Revista Brasileira de Educação Médica* [Internet]. 2022;46(1):1–9. <https://doi.org/10.1590/1981-5271v46.1-20210242>
119. Mendes TB, de Souza KC, França CN, Rossi FE, Santos RPG, Duailibi K, et al. Physical activity and symptoms of anxiety and depression among medical students during a pandemic. *Revista Brasileira de*

Medicina do Esporte. 2021;27(6):582–7. https://doi.org/10.1590/1517-8692202127062021_0059

120. Mendes TC, Dias ACP. Psychological disorders and coping strategies among undergraduate medical students during the COVID-19 pandemic in Brazil. *Revista Brasileira de Educação Médica*. 2022;46(3):1–13. <https://doi.org/10.1590/1981-5271v46.3-20220061.ING>

121. Dziejdzic DM, Dell’Agnelo GS, Schindler Junior E, Lindstron OA, Andrade FA, Nisihara R. Anxiety and insecurity in medical interns: the impact of the pandemic COVID-19. *Medicina* [Internet]. 2022;55(2). <https://doi.org/10.11606/issn.2176-7262.rmrp.2022.191222>

122. Fernandes ACA, Padilha D de MM, de Moura ACMA, de Aquino CEF, de Araújo Lima IB, Mota-Rolim SA. COVID-19 pandemic decreased sleep quality of medical students. *Sleep Science*. 2022;15(4):436–40. <https://doi.org/10.5935/1984-0063.20220075>

123. Souza KC de, Mendes TB, Gomes THS, Silva AA da, Nali LH da S, Bachi ALL, et al. Medical students show lower physical activity levels and higher anxiety than physical education students: a cross-sectional study during the COVID-19 pandemic. *Frontiers Psychiatry*. 2021;12:804967. <https://doi.org/10.3389/fpsy.2021.804967>

124. Mota RC, Pinheiro RO, Avena KM, Fernando L, Mesquita Q De, Dunningham WA. COVID-19 e transtorno de ansiedade generalizada : impacto da pandemia nos estudantes de medicina. *Revista Brasileira de Neurologia e Psiquiatria* 25(2):4–18.

125. Perissotto T, Silva TCRPD, Miskulin FPC, Pereira MB, Neves BA, Almeida BC, et al. Mental health in medical students during Covid-19 quarantine: A comprehensive analysis across year-classes. *Clinics* [Internet]. 2021;76:e3007. <https://doi.org/10.6061/clinics/2021/e3007>

126. Portela JMG, Mello A de L, Freitas E de O, Silva RM da, Carmo DRP do, Siqueira DF de. Uso de substâncias psicoativas e saúde mental de estudantes universitários durante a pandemia da COVID-19. *Revista Mineira de Enfermagem*. 2022;26. <https://doi.org/10.35699/2316-9389.2022.37251>

127. Ramos SRF, Braga Filho RA, Carvalho MA de, Costa DD, Carvalho LA de, Almeida MTC. The Covid-19 pandemic: a traumatic event for health and biological science students? *Revista Brasileira de Educação Médica*. 2023;47(1):1–12. <https://doi.org/10.1590/1981-5271v47.1-20220172.ING>

128. Ribeiro MGR, de Siqueira RB, Dunningham WA. AVALIAÇÃO DA IDEIAÇÃO SUICIDA EM ESTUDANTES DE MEDICINA EM UMA INSTITUIÇÃO PRIVADA DO ENSINO SUPERIOR DA CIDADE DE SALVADOR–BA. *Revista Brasileira de Neurologia e Psiquiatria*. 2020;24(2).

129. Santos BC Dos, Almeida DDAC de, Guillarducci NV, Machado RRP. Body dissatisfaction among undergraduate medical students in the city of Juiz de Fora, Minas Gerais, Brazil. *Einstein (Sao Paulo)*. 2022;20:eAO6648. https://doi.org/10.31744/einstein_journal/2022AO6648

130. Sartorão Filho CI, Rodrigues WC de LV, Castro RB de, Marçal AA, Pavelqueires S, Takano L, et al. Moderate and severe symptoms of anxiety and depression are increased among female medical students during the COVID-19 pandemic. *Research Society and Development*. <https://doi.org/10.33448/rsd-v10i6.15406>

131. de Oliveira Kubrusly Sobral JB, Lima DLF, Lima Rocha HA, de Brito ES, Duarte LHG, Bento LBBB, et al. Active methodologies association with online learning fatigue among medical students. *BMC Medical Education* [Internet]. 2022;22(1):1–7. <https://doi.org/10.1186/s12909-022-03143-x>

132. Teixeira L de AC, Costa RA, de Mattos RMPR, Pimentel D. Brazilian medical students’ mental health during coronavirus disease 2019 pandemic. *Jornal Brasileiro de Psiquiatria*. 2021;70(1):21–9. <https://doi.org/10.1590/0047-2085000000315>

133. Abreu DDC, da Silva JPC, da Silva Paiva L, dos Santos Figueiredo FW, do Souto RP. Night eating syndrome among university students: are aspects of academic life associated with eating disorders? *Journal of Human Growth and Development*. 2023;33(2):173–83. <https://doi.org/10.36311/jhgd.v33.14933>
134. de Araújo DCSA, Rocha KSS, Cerqueira-Santos S, Menezes PWDS, Dos Santos SNP, Dos Santos WM, et al. Communication Apprehension Among Health Professions Students in Brazil. *American Journal of Pharmaceutical Education*. 2022;86(3):186–91. <https://doi.org/10.5688/ajpe8603>
135. Carro AC, Nunes RD. Suicidal ideation as a factor associated with burnout syndrome in medical students. *Jornal Brasileiro de Psiquiatria*. 2021;70(2):91–8. <https://doi.org/10.1590/0047-2085000000302>
136. da Silva Cardoso GM, da Silva MPFN, de Castro Corrêa C, Weber SAT. Insomnia and excessive daytime sleepiness in medical students: consequences of the use of technologies? *Sleep Science*. 2022;15(Special 1):116–9. <https://doi.org/10.5935/1984-0063.20220008>
137. Pereira MB, Casagrande AV, Almeida BC, Neves BA, da Silva TCRP, Miskulin FPC, et al. Mental Health of Medical Students Before and During COVID-19 Pandemic: a 3-Year Prospective Study. *Medical Science Educator* [Internet]. 2022;32(4):873–81. <https://doi.org/10.1007/s40670-022-01580-3>
138. Saraswathi I, Saikarthik J, Kumar KS, Srinivasan KM, Ardhanaari M, Gunapriya R. Impact of COVID-19 outbreak on the mental health status of undergraduate medical students in a COVID-19 treating medical college: a prospective longitudinal study. *PeerJ*. 2020;8:e10164. <https://doi.org/10.7717/peerj.10164>
139. Pierce M, Hope H, Ford T, Hatch S, Hotopf M, John A, et al. Mental health before and during the COVID-19 pandemic: a longitudinal probability sample survey of the UK population. *The Lancet Psychiatry*. 2020;7(10):883–92. [https://doi.org/10.1016/S2215-0366\(20\)30308-4](https://doi.org/10.1016/S2215-0366(20)30308-4)
140. Rotenstein LS, Ramos MA, Torre M, Bradley Segal J, Peluso MJ, Guille C, et al. Prevalence of depression, depressive symptoms, and suicidal ideation among medical students a systematic review and meta-analysis. Vol. 316, *JAMA - Journal of the American Medical Association*. American Medical Association; 2016. p. 2214–36. <https://doi.org/10.1001/jama.2016.17324>
141. Munhoz TN, Nunes BP, Wehrmeister FC, Santos IS, Matijasevich A. A nationwide population-based study of depression in Brazil. *Journal of Affective Disorders* [Internet]. 2016;192:226–33 <http://dx.doi.org/10.1016/j.jad.2015.12.038>
142. Andrade LH, Wang YP, Andreoni S, Silveira CM, Alexandrino-Silva C, Siu ER, et al. Mental disorders in megacities: Findings from the São Paulo megacity mental health survey, Brazil. *PLoS One*. 2012;7(2). <https://doi.org/10.1371/journal.pone.0031879>
143. Collaborators GBD 2019 MD. Global, regional, and national burden of 12 mental disorders in 204 countries and territories, 1990–2019: a systematic analysis for the Global Burden of Disease Study 2019. *The Lancet Psychiatry*. 2022;9(2):137–50. [https://doi.org/10.1016/S2215-0366\(21\)00395-3](https://doi.org/10.1016/S2215-0366(21)00395-3)
144. Peng P, Hao Y, Liu Y, Chen S, Wang Y, Yang Q, et al. The prevalence and risk factors of mental problems in medical students during COVID-19 pandemic: A systematic review and meta-analysis. *Journal of Affective Disorders*. 2023;321:167–81. <https://doi.org/10.1016/j.jad.2022.10.040>
145. Gardani M, Bradford DRR, Russell K, Allan S, Beattie L, Ellis JG, et al. A systematic review and meta-analysis of poor sleep, insomnia symptoms and stress in undergraduate students. *Sleep Medicine Reviews* [Internet]. 2022;61:101565. <https://doi.org/10.1016/j.smrv.2021.101565>
146. Scott AJ, Webb TL, Martyn-St James M, Rowse G, Weich S. Improving sleep quality leads to better mental health: A meta-analysis of randomised controlled trials. *Sleep Medicine Reviews* [Internet].

2021;60:101556. Available from: <https://doi.org/10.1016/j.smr.2021.101556>

147. Lim GY, Tam WW, Lu Y, Ho CS, Zhang MW, Ho RC. Prevalence of Depression in the Community from 30 Countries between 1994 and 2014 /692/699/476/1414 /692/499 article. *Scientific Reports* [Internet]. 2018;8(1):1–10. Available from: <http://dx.doi.org/10.1038/s41598-018-21243-x>

148. Seedat S, Scott KM, Angermeyer MC, Berglund P, Bromet EJ, Brugha TS, et al. Cross-national associations between gender and mental disorders in the World Health Organization World Mental Health Surveys. *Archives of General Psychiatry*. 2009;66(7):785–95. <https://doi.org/10.1001/archgenpsychiatry.2009.36>

149. Azim SR, Yusoff MSB, Roslan NS. Mapping the multidimensional factors of medical student resilience development: A scoping review. *BMC Medical Education*. 2025;25(1). <https://doi.org/10.1186/s12909-025-07290-9>

150. Chye SM, Kok YY, Chen YS, Er HM. Building resilience among undergraduate health professions students: identifying influencing factors. *BMC Medical Education*. 2024;24(1):1168. <https://doi.org/10.1186/s12909-024-06127-1>