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The Relationship Between Academic Stress Levels and Sleep Quality Among Health Sciences Students: A Systematic Literature Review

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Abstract

Academic stress and poor sleep quality are increasingly common among health sciences students due to intensive academic workloads, clinical training, and continuous performance evaluations. These conditions adversely affect psychological well-being, learning capacity, and academic performance. This study synthesized recent evidence on the relationship between academic stress and sleep quality through a Systematic Literature Review (SLR) in accordance with the PRISMA 2020 guidelines. Literature searches were conducted in Scopus, PubMed, ScienceDirect, and Google Scholar for studies published between 2020 and 2026. Of 322 identified records, 22 studies met the inclusion criteria and were included in the qualitative synthesis. The findings consistently showed that higher academic stress was associated with poorer sleep quality, including shorter sleep duration, longer sleep latency, frequent nocturnal awakenings, and greater daytime dysfunction. Major stressors included academic workload, examinations, clinical practice, and poor time management, while irregular sleep schedules, excessive screen time, and caffeine consumption further worsened sleep quality. These findings highlight the need for integrated stress management, sleep hygiene education, and mental health support programs to improve students' well-being and academic success.

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Introduction

Sleep is a fundamental physiological process that plays a vital role in cognitive performance, emotional regulation, immune function, and overall health. Adequate sleep is particularly important for university students because it supports learning capacity, memory consolidation, decision-

making, and academic achievement (Alwhaibi & Al Aloola, 2023). Furthermore, healthy sleep contributes to students' psychological well-being and their ability to cope with academic challenges (Souza et al., 2021). However, insufficient sleep and sleep disturbances have become a major public health concern among university students worldwide. Recent studies reported that 55–76% of health sciences students experience poor sleep quality, while approximately 40–70% report moderate to high academic stress (Alwhaibi & Al Aloola, 2023; Huang et al., 2024).

Sleep is a fundamental physiological process that plays a vital role in cognitive performance, emotional regulation, immune function, and overall health. Adequate sleep is particularly important for university students because it supports learning capacity, memory consolidation, decision-making, and academic achievement (Alwhaibi & Al Aloola, 2023). Furthermore, healthy sleep contributes to students' psychological well-being and their ability to cope with academic challenges (Souza et al., 2021). However, insufficient sleep and sleep disturbances have become a major public health concern among university students worldwide. Recent evidence indicates that more than half of university students experience poor sleep quality, with health sciences students consistently reporting a higher prevalence due to demanding academic workloads, clinical training, and continuous assessments that frequently disrupt normal sleep patterns (Medikonda, 2023).

The relationship between academic stress and sleep quality has been supported by both theoretical and empirical evidence. Academic stress activates the hypothalamic–pituitary–adrenal (HPA) axis, increasing cortisol secretion and physiological arousal, thereby disrupting normal sleep regulation (Cheng et al., 2025). In turn, poor sleep impairs emotional regulation and coping ability, creating a reciprocal cycle that further increases perceived academic stress. Consistent findings show that students with higher academic stress tend to experience poorer sleep quality, including longer sleep latency, shorter sleep duration, frequent nocturnal awakenings, and greater daytime dysfunction (Arzani-Birgani et al., 2021). Similarly, Aydin & Aydin (2024) found that sleep quality is closely associated with students' quality of life and academic self-efficacy. However, variations in study populations, educational settings, measurement instruments, and contextual factors have produced differences in the reported strength of this relationship, highlighting the need for a comprehensive synthesis of the available evidence.

Although research on this topic has increased, most studies have focused on individual disciplines, such as medicine or nursing, limiting the generalizability of findings across health sciences programs (Li et al., 2025). Moreover, differences in educational systems, academic workloads, and sociocultural contexts may shape students' perceptions of stress and sleep behaviors, contributing to inconsistent findings (Zhao & Zhang, 2024). Existing studies have also largely reported associations within specific populations rather than integrating evidence across multiple health sciences disciplines. As a result, there remains limited systematic evidence that synthesizes recent findings, compares recurring patterns, identifies key stressors and sleep-related outcomes, and highlights research trends and knowledge gaps. This gap restricts the development of evidence-based strategies to improve students' well-being.

Therefore, this study conducted a Systematic Literature Review (SLR) following the PRISMA 2020 guidelines to synthesize evidence on the relationship between academic stress and sleep quality among health sciences students. By integrating studies published between 2020 and 2026, this review provides a comprehensive overview of the association, identifies consistent patterns, research trends, and remaining knowledge gaps, and offers evidence-based recommendations for stress management, sleep hygiene, and mental health support in higher education. Accordingly, this review aims to examine the relationship between academic stress and sleep quality, identify the major contributing factors, synthesize findings across studies, and provide recommendations for future research and institutional policy.

Materials and Methods

This study employed a Systematic Literature Review (SLR) to synthesize existing evidence regarding the relationship between academic stress and sleep quality among health sciences students. The review followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA 2020) guidelines to ensure a transparent, systematic, and reproducible literature selection process. The review aimed to identify, evaluate, and summarize empirical studies investigating the association between academic stress and sleep quality in higher education settings.

Search Strategy

A comprehensive literature search was conducted using four electronic databases: Scopus, PubMed, ScienceDirect, and Google Scholar. The search included studies published between 2020 and 2026 to capture recent evidence on the topic. The following search terms and Boolean operators were applied: ("academic stress" OR "student stress") AND ("sleep quality" OR "sleep disturbance") AND ("health sciences students" OR "medical students" OR "nursing students" OR "healthcare students"). Only articles published in English, available in full text, and reporting original empirical research were considered.

Eligibility Criteria

Studies were included if they (1) investigated university students enrolled in health-related academic programs, (2) examined academic stress as the primary independent variable, (3) assessed sleep quality as the primary outcome, (4) used quantitative or observational research designs, (5) were published in peer-reviewed journals, and (6) were written in English. Studies were excluded if they were review articles, conference proceedings, editorials, commentaries, theses, duplicate publications, or did not specifically evaluate the relationship between academic stress and sleep quality.

Study Selection

The study selection process consisted of four stages following the PRISMA framework. Initially, 322 records were identified through database searching. After removing duplicate records and publications that did not meet the publication period or language requirements, 187 articles remained for title and abstract screening. During the screening stage, articles that were irrelevant to the research objectives or did not involve health sciences students were excluded, leaving 64 articles for full-text eligibility assessment. Following a detailed evaluation against the predetermined inclusion and exclusion criteria, 22 studies were deemed eligible and included in the final qualitative synthesis.

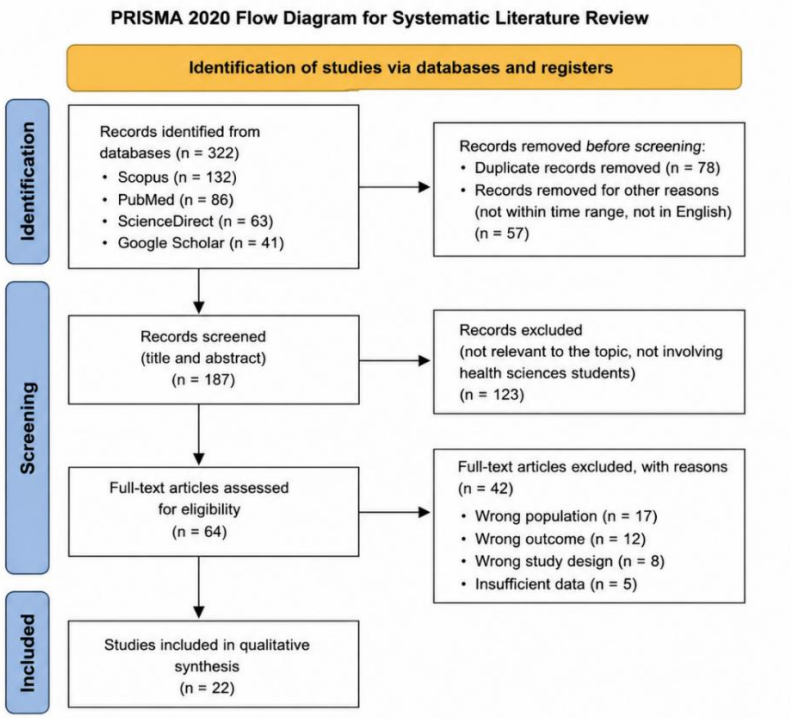

Figure 1. PRISMA 2020 flow diagram illustrating the study selection process.

Data Extraction and Data Synthesis

Data were extracted using a standardized form to ensure consistency across the included studies. The extracted information comprised the first author's name, publication year, country, study design, participant characteristics, sample size, academic stress and sleep quality measurement instruments, statistical analysis, and principal findings. The evidence was then synthesized narratively by comparing study characteristics, identifying recurring patterns, and summarizing the relationship between academic stress and sleep quality among health sciences students. This synthesis also considered variations in study contexts and measurement instruments to identify research trends, highlight knowledge gaps, and provide evidence-based implications for future research and higher education practice.

Results and Discussions

Characteristics of the Included Studies

Following the PRISMA selection process, 22 studies met the eligibility criteria and were included in the qualitative synthesis. To provide an overview of the included evidence, the selected studies were mapped according to publication year, country, study design, participant characteristics, academic stress measurement instruments, and sleep quality assessment tools, as illustrated in Figure 2. The mapped studies originated from various countries and reflected diverse educational environments and cultural contexts. Most studies employed cross-sectional research designs and investigated undergraduate students enrolled in medicine, nursing, dentistry, pharmacy, and other health sciences disciplines.

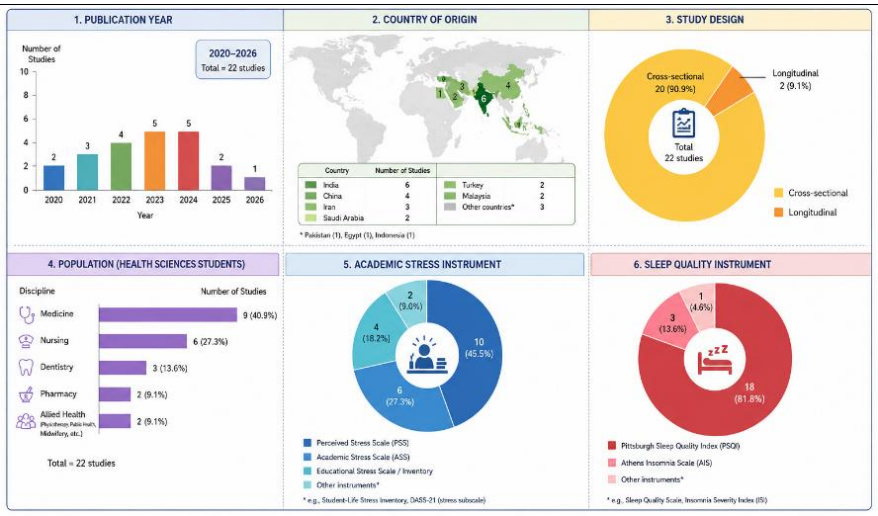

Figure 2. Evidence mapping of the included studies according to publication year, country, study design, population, academic stress instrument, and sleep quality instrument.

The reviewed studies predominantly measured academic stress using standardized questionnaires such as the Perceived Stress Scale (PSS), Academic Stress Scale (ASS), or Educational Stress Scale, whereas sleep quality was most frequently assessed using the Pittsburgh Sleep Quality Index (PSQI). Sample sizes varied considerably, ranging from fewer than 100 participants to more than 1,000 students. Overall, the evidence mapping demonstrates that despite methodological differences, the included studies consistently examined the relationship between academic stress and sleep quality among health sciences students, providing a comprehensive basis for the subsequent qualitative synthesis.

Academic Stress Among Health Sciences Students

Across the reviewed studies, academic stress was consistently reported as a common psychological challenge experienced by health sciences students. High academic workloads, frequent examinations, clinical practice requirements, and time management difficulties were identified as the primary sources of stress. Students enrolled in medicine, nursing, and dentistry generally reported higher stress levels than students in non-health disciplines due to the intensive nature of their educational programs. Recent evidence also indicates that perceived academic stress remains highly prevalent among university students and is closely associated with psychological distress and impaired sleep quality (Benítez-Agudelo et al., 2025; Huang et al., 2024; Zhao & Zhang, 2024).

Several studies further indicated that female students tended to report higher perceived academic stress than male students, although this difference was not consistently observed across all studies. Additional factors associated with increased stress included limited social support, financial concerns, academic competition, and fear of academic failure (Jowkar et al., 2022). Studies have also shown that adaptation problems and interpersonal relationships may exacerbate academic stress, thereby increasing the likelihood of poor sleep quality among university students (Zhao & Zhang, 2024).

Despite variations in stress levels across institutions and countries, the overall evidence demonstrated that moderate to high academic stress is prevalent among health sciences students (Alhamed, 2023). The findings emphasize the need for universities to implement effective stress-management strategies and provide adequate psychological support to mitigate the negative consequences of prolonged academic pressure.

Sleep Quality Among Health Sciences Students

The reviewed literature revealed that poor sleep quality was highly prevalent among health sciences students. Most studies reported that more than half of the participants experienced sleep disturbances, including delayed sleep onset, insufficient sleep duration, nighttime awakenings, and excessive daytime sleepiness. Irregular sleep schedules caused by academic obligations and prolonged study hours were frequently identified as contributing factors (Toubasi et al., 2022). Recent longitudinal and observational studies likewise confirmed that sleep disturbances remain widespread among university students and are strongly associated with elevated stress levels (Brown & Papp, 2024; Lukowski et al., 2024).

Several studies also reported that increased use of electronic devices before bedtime, caffeine consumption, and psychological distress further contributed to deteriorating sleep quality. Clinical placement schedules and overnight academic activities were additional factors affecting sleep among medical and nursing students (Allende-Rayme et al., 2022; Alotaibi et al., 2020). These behaviors often disrupted circadian rhythms and reduced sleep efficiency. Furthermore, wearable-device studies have demonstrated that sleep characteristics can predict students' stress levels, highlighting the close interaction between sleep patterns and psychological well-being (Bloomfield et al., 2024).

Overall, the findings indicate that poor sleep quality remains a major concern among health sciences students, as it may negatively affect cognitive performance, emotional regulation, clinical decision-making, and academic achievement. Therefore, promoting healthy sleep habits should be a key component of student health programs. Recent evidence shows that sleep hygiene education can improve both sleep quality and perceived stress among undergraduate students (Ghoul et al., 2025). Furthermore, psychological factors, particularly perceived stress and sleep anxiety, have been found to sequentially mediate the relationship between quality of life and sleep quality, emphasizing the importance of integrating mental health promotion with sleep health interventions in higher education (Zang et al., 2025).

Relationship Between Academic Stress and Sleep Quality

The qualitative synthesis consistently demonstrated a significant association between academic stress and sleep quality across the included studies. Students experiencing higher levels of academic stress generally reported poorer sleep quality, including shorter sleep duration, increased sleep latency, lower sleep efficiency, and more frequent nighttime awakenings (Busa et al., 2023). These findings were consistent regardless of differences in country, educational institution, or health discipline. Recent studies further support this relationship by demonstrating that perceived stress directly predicts poor sleep quality, while anxiety, depression, and adaptation difficulties partially mediate this association (Huang et al., 2024; Zhao & Zhang, 2024).

Several studies explained this relationship through physiological and psychological mechanisms. Elevated stress levels increase activation of the hypothalamic-pituitary-adrenal (HPA) axis, leading to greater cortisol secretion and physiological arousal that interfere with normal sleep regulation (Bayoumy et al., 2023; Razaq et al., 2024). In addition, excessive worry regarding examinations, academic performance, and clinical responsibilities contributes to difficulties initiating and maintaining sleep. Longitudinal evidence likewise indicates that prolonged academic stress negatively affects psychological well-being, health behaviors, and academic performance over time (Benítez-Agudelo et al., 2025).

Although the strength of the association varied across studies, the overall evidence supports the conclusion that academic stress is an important predictor of poor sleep quality among health sciences students. These findings highlight the importance of integrated interventions that simultaneously address stress management and healthy sleep behaviors to improve students' psychological well-being and academic performance.

Discussion

The findings of this systematic literature review demonstrate a consistent relationship between academic stress and sleep quality among health sciences students. Across the 22 included studies, higher academic stress was consistently associated with poorer sleep quality, regardless of country, educational system, or health sciences discipline, indicating that academic stress is a common factor affecting students' sleep. These findings highlight the importance of psychological well-being as a key component of academic success. Recent evidence further suggests that academic stress not only reduces sleep quality but also interacts with anxiety, depression, and adaptation difficulties, leading to greater psychological distress among university students (Huang et al., 2024; Zhao & Zhang, 2024). In addition, unhealthy lifestyle behaviors, such as inadequate sleep, irregular daily routines, and poor stress management, have been shown to reinforce the negative effects of academic stress, indicating that this relationship should be understood within a broader biopsychosocial context (Salazar-Granizo et al., 2024).

The demanding nature of health sciences curricula can largely explain the high prevalence of academic stress identified in the reviewed studies. Students are expected to master extensive theoretical knowledge while simultaneously developing clinical competencies through laboratory work, practical training, and professional assessments. These multiple responsibilities often create considerable time pressure and increase concerns regarding academic performance. When students perceive that these demands exceed their available coping resources, psychological stress develops, which may subsequently influence both mental and physical health. Therefore, effective stress management strategies are essential for maintaining students' overall well-being throughout their academic journey. Recent longitudinal evidence also indicates that increasing academic pressure during examination periods elevates test anxiety and maladaptive learning behaviors, both of which contribute indirectly to worsening sleep quality. Therefore, institutional interventions should address not only academic workload but also students' motivational and emotional regulation strategies (de Casteele et al., 2025).

The review also demonstrated that poor sleep quality is highly prevalent among health sciences students. In addition to academic pressure, several behavioral and lifestyle factors contributed to sleep disturbances, including irregular sleep schedules, prolonged screen time before bedtime, caffeine consumption, and limited rest due to academic commitments. These factors may collectively disrupt normal sleep architecture, leading to delayed sleep onset, reduced sleep efficiency, and excessive daytime sleepiness. Since adequate sleep is fundamental for cognitive functioning, memory consolidation, and emotional regulation, persistent sleep disturbances may substantially compromise students' learning capacity and academic performance. These findings are consistent with longitudinal studies reporting that poor sleep and chronic stress jointly contribute to declines in students' psychological well-being and academic functioning (Benítez-Agudelo et al., 2025; Brown & Papp, 2024; Lukowski et al., 2024).

The association between academic stress and sleep quality can be explained through physiological and psychological mechanisms. Academic stress activates the hypothalamic–pituitary–adrenal (HPA) axis, increasing cortisol secretion and physiological arousal, thereby disrupting normal sleep. At the same time, concerns about examinations, assignments, and academic performance heighten cognitive arousal, making it more difficult to initiate and maintain sleep. Conversely, inadequate sleep weakens emotional regulation and resilience, increasing vulnerability to academic stress. This reciprocal relationship is further supported by evidence showing that adaptation problems and interpersonal relationships partially mediate the effect of academic stress on sleep quality, suggesting that stronger social adjustment and campus support may help reduce sleep disturbances (Zhao & Zhang, 2024).

These findings have important implications for higher education institutions, particularly health sciences programs. Alongside academic achievement, universities should promote students'

psychological well-being and healthy sleep behaviors through stress-management programs, counseling, time-management training, sleep-hygiene education, and early identification of psychological distress. Evidence from randomized controlled trials shows that brief sleep hygiene interventions can improve sleep quality while reducing perceived stress (Ghoul et al., 2025). In addition, institution-wide policies integrating stress management, healthy lifestyle promotion, and sleep education into academic support services are recommended, as multidimensional approaches are more effective than single-component interventions in addressing the behavioral, psychological, and academic determinants of sleep quality (de Casteele et al., 2025; Salazar-Granizo et al., 2024).

Despite providing a comprehensive synthesis of recent evidence, this review has several limitations. First, most of the included studies employed cross-sectional designs, limiting the ability to establish causal relationships between academic stress and sleep quality. Second, considerable heterogeneity existed in measurement instruments, sample characteristics, and educational contexts, which may have affected the consistency of the reported findings. Third, only English-language studies published between 2020 and 2026 were included, potentially excluding relevant evidence from other languages or earlier publications. Future research should incorporate longitudinal and multicenter study designs, employ standardized assessment instruments, and examine additional factors, including coping strategies, resilience, social support, and lifestyle behaviors, to understand better the complex relationship between academic stress and sleep quality among health sciences students.

Conclusion

This systematic literature review demonstrates that academic stress is consistently associated with sleep quality among health sciences students. Based on the synthesis of 22 eligible studies, students experiencing higher levels of academic stress were more likely to report poorer sleep quality, including reduced sleep duration, prolonged sleep latency, frequent nighttime awakenings, and increased daytime dysfunction. The findings indicate that the demanding academic environment in health sciences education contributes substantially to psychological stress, which subsequently affects students' sleep patterns and overall well-being. These results highlight the importance of addressing both academic stress and sleep quality as interconnected factors that influence learning outcomes and student health.

The findings have important practical implications for higher education institutions and policymakers. Universities should integrate mental health promotion and sleep health initiatives into student support services by providing stress management programs, sleep hygiene education, psychological counseling, and time management training. Academic administrators may also consider reviewing curriculum design, assessment schedules, and clinical workload to reduce unnecessary academic pressure while maintaining educational standards. Implementing these strategies may improve students' psychological well-being, academic performance, and readiness for future professional practice in healthcare settings.

Future research should adopt longitudinal or prospective designs to clarify the causal relationship between academic stress and sleep quality. Studies should also include more diverse populations across health sciences disciplines and countries while using standardized measurement instruments to improve comparability. In addition, future research is encouraged to examine the roles of coping strategies, resilience, social support, physical activity, and digital technology use as potential mediators or moderators. Although this review provides a comprehensive synthesis of recent evidence, its findings are limited by the predominance of cross-sectional studies, methodological heterogeneity, and the inclusion of only English-language publications from 2020 to 2026. Addressing these limitations will strengthen the evidence base and support the development of more effective interventions to improve the well-being of health sciences students.

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