Academic and Personal Factors Associated with Stress in Health Sciences Students and Coping Strategies

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Abstract

Various daily factors influence people's well-being and performance, like interpersonal relations, work and school environment and their loads. This can affect mental health and cause stress. When stress is constant and lengthy, it can lead to Burnout, which is a syndrome including fatigue, disinterest and low productivity. To counter this, strategies such as resilience, empathy and mindfulness have been studied to significantly reduce stress. This paper seeks to identify the academic and personal factors related to stress in students in the health field, and the coping strategies to mitigate their effects.

Keywords: Stress; Health Student; Coping skills; Mindfulness; Burnout Syndrome.

Introduction

The field of health sciences presents various challenges during academic training, including an intense academic workload, demanding clinical practice, and decision-making with significant emotional impact. Although these experiences are enriching, they are often accompanied by considerable

stress, which negatively affects physical, mental, and academic well-being. Key contributing factors include intensive schedules, separation from family support networks, limited time for self-care, and financial difficulties, all of which may compromise academic performance during training and future capacity to practice effectively and in a balanced manner.

The literature on stress in this population identifies multiple sources, ranging from high performance expectations to difficulties in balancing personal and academic life. Recent studies have shown that sociodemographic factors, such as belonging to minority or low-income groups, exacerbate this situation due to structural inequalities in access to resources and financial support. Additionally, academic factors, such as assessment-related activities and the classroom environment, also impact students' well-being (1). Furthermore, research has revealed that academic stress may manifest through physical and emotional symptoms that affect performance in evaluations and raise concerns about their validity as measures of knowledge (2).

As a result, strategies to reduce stress and prevent its chronicity have been explored, as prolonged stress may lead to burnout syndrome. One of the most widely studied interventions is mindfulness, which has been shown to reduce emotional stress and produce beneficial effects on mood. However, a narrative review conducted in 2021 highlighted certain limitations in existing studies, such as reliance on volunteer samples and the lack of longitudinal follow-up (3). This study not only aims to raise awareness about the need for intervention but also to guide the development of programs that achieve a balance between academic demands and mental health.

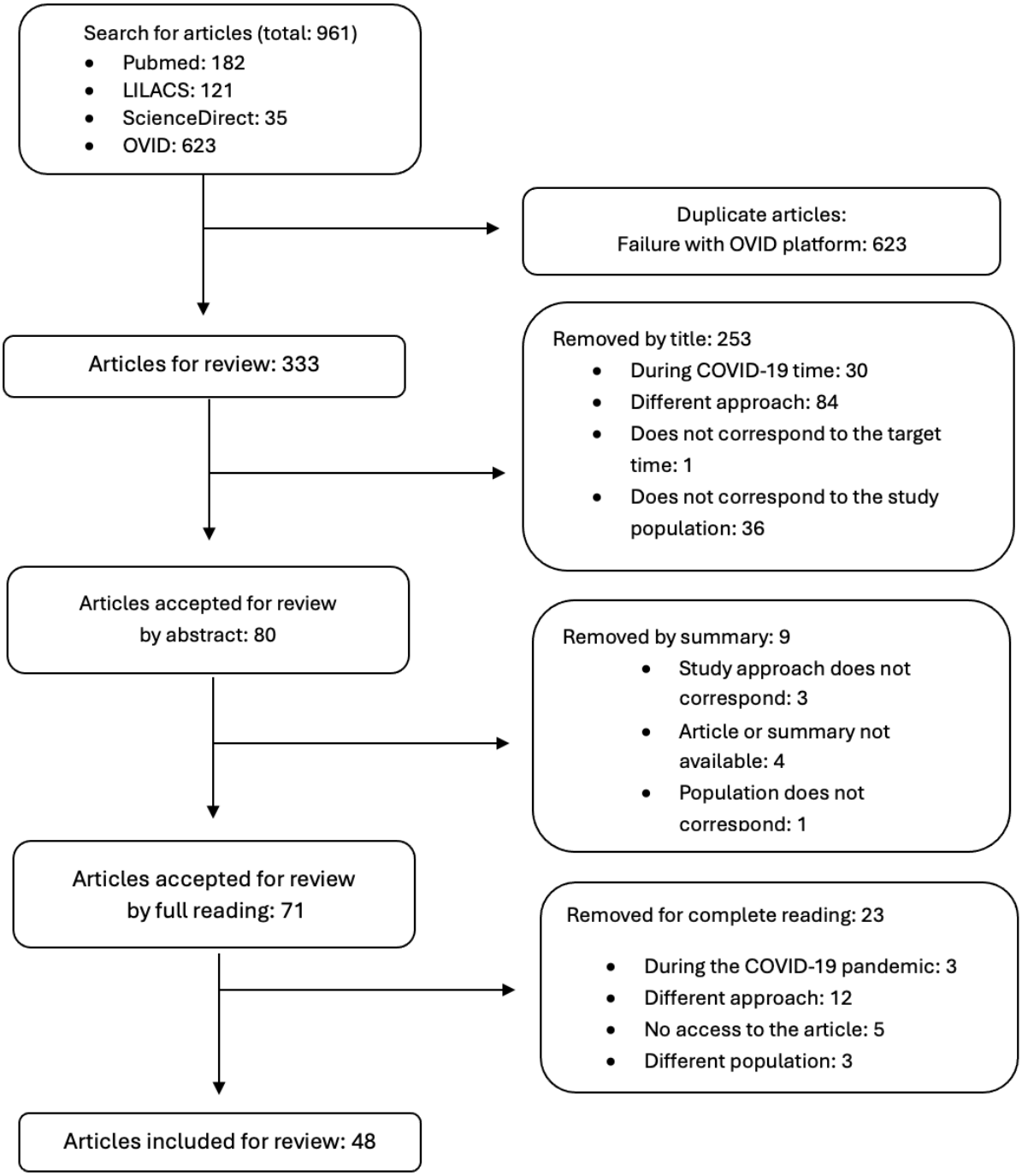
Methodology

Search Strategy

A search was conducted in the PubMed, LILACS, and ScienceDirect databases using MeSH and DeCS terms up to August 2024. Filters were applied for full-text articles ("free full text," "full text"), as well as for clinical studies, reviews, and meta-analyses published in the last five years, in English, Portuguese, and Spanish.

Initially, 961 articles were identified (PubMed: 182; LILACS: 121; ScienceDirect: 35; Ovid: 623); however, articles retrieved from Ovid were excluded due to technical issues with the platform. After removing five duplicates, 333 articles were included for screening, which was conducted in three phases: first by title, then by abstract, resulting in 71 selected articles. Finally, a total of 48 articles were included based on full-text review and relevance to the study (Figure 1).

Figure 1. Methodology for the selection of studies included in the review



Source: own elaboration.

Articles published from 2019 onwards that addressed personal and academic factors associated with stress and emotional fatigue were included. Additionally, studies related to mental health, published in national and international journals, were considered, in accordance with the focus of this review.

Results

Factors Associated with Stress and Emotional Exhaustion

Stress and academic burnout are common among medical students, particularly during clinical years, due to emotional and academic demands, along with the presence of stressors defined as "personal or environmental events that cause stress." These include ethical dilemmas, competitive environments, decisions related to mortality, and situations that challenge professional values. This, together with prolonged study periods and unhealthy lifestyles, such as skipping meals or reducing sleep hours, contributes to their development (6, 27, 34).

The relationship between sleep and academic performance is significant, as it has been demonstrated that students who sleep fewer than seven hours per night experience notable declines in concentration and memory, which may negatively affect their exam scores (17).

This is consistent with a study that evaluated the effects of stress on medical students and its impact on academic performance, focusing on a mindfulness-based intervention (MBI). High academic demands, workload, sleep deprivation, and exposure to patient suffering were identified as factors contributing to anxiety, depression, and burnout, thereby negatively impacting psychological well-being and academic performance (31).

However, academic demands are not the only factors affecting students. Financial aspects, including tuition costs and living expenses, also contribute to the persistence of stress and emotional exhaustion. This aligns with evidence indicating that debt imposes a negative burden on mental health, academic performance, and even students' specialty choices (22, 33).

Additionally, financial stress has been reported to disproportionately affect students from racial and ethnic minority groups and those with low income. Conflicts in balancing academic and personal life, along with difficulties in interpersonal relationships and administrative setbacks, have also been described (5).

Mistreatment in medical training has also been reported as frequent, with an incidence of 59.6%, including acts of humiliation, psychological or physical punishment, and even sexual harassment. These situations may lead to regret regarding career choice, emotional distress, and even impair information retention (34).

Regarding personal relationships, distance from the family nucleus among international students has been associated with higher levels of stress. This

was evidenced in a study conducted in Italy involving 2,455 students, in which the Perceived Stress Scale (PSS-10) was used, showing an association between both variables in 60% of the studied population (4).

Stressors affect moral courage, defined as the ability to act according to ethical values in challenging situations. Furthermore, stress and reduced professional efficacy have been shown to negatively influence the willingness to act with moral courage (27). Similarly, academic performance is affected, as evidenced in a study of first-year anatomy students, in which 50% of participants reported anxiety prior to examinations, leading to difficulty concentrating and negatively impacting evaluation outcomes (2). This correlates with evidence indicating that stress is inversely related to academic performance and that its chronicity impairs concentration and learning capacity (17).

Likewise, the impact of academic stress on performance and quality of life was analyzed in medical and dental students in Pakistan, where 51.1% of participants presented high levels of academic stress, with a higher prevalence in males ($p < 0.05$). Although 73.4% perceived a positive educational environment, academic stress showed a negative correlation with both performance and quality of life; additionally, students with higher stress tended to achieve lower grades (32).

On the other hand, a meta-analysis on psychological stress reported an incidence of 61.97% (95% confidence interval) among nursing students (9). This results in significant mental exhaustion due to high academic workload, consistent with previous studies showing how academic pressure and competition exacerbate stress, reduce satisfaction, and generate thoughts of dropping out (20, 21). However, research also shows that resilience and determination have a positive impact, as they enable students to better cope with challenges and improve academic outcomes (17).

Furthermore, students frequently use both problem-focused and emotion-focused coping strategies to manage stress; problem-focused strategies are more effective, whereas emotion-focused strategies tend to exacerbate stress (19). Therefore, not all factors are negative, as supportive family relationships have also been shown to promote positive thinking, leading to a more balanced life, better performance, and lower stress levels (6).

It is important to understand that the impact of a stressor varies depending on its characteristics and the individual experiencing it, as each person perceives it differently, influenced by cultural background, personal traits,

and coping capacity (6). Academic stress is not uniform; it varies according to gender, type of training, and evaluation methods. In turn, a study conducted among 464 students in Indonesia using the Perceived Stress Scale (PSS-10) found that stress scores were higher in women than in men ($p = 0.047$). Additionally, differences in stress levels were observed according to the year of study, with first-, second-, and third-year students being more affected compared to sixth-year students (28). This evidence highlights the need for a balanced approach in academic policy to promote performance without compromising emotional well-being (18).

Multiple factors, such as anxiety, depression, distress, and sleep quality, to which medical students are frequently exposed, significantly impact their mental health and performance. A high prevalence of moderate (40%) and severe anxiety (24.1%) has been reported, highlighting the increasing burden of mental distress and the need to implement effective measures to improve both the timeliness and quality of interventions addressing these issues in students (39).

Similarly, a study conducted in 2021 at a university in Bucharest (Romania), using the Perceived Stress Scale, analyzed 118 students (25 men and 93 women). The results showed that high stress levels significantly affect academic performance ($p < 0.018$), and that low resilience also plays an important role ($p < 0.039$). Additionally, students in clinical stages experienced higher stress levels than those in preclinical stages ($p < 0.028$), suggesting that emotional and academic burden increases as training progresses. It was also observed that sixth-year students ($n = 41$) reported low satisfaction with their academic performance, which impacts motivation and affects confidence when seeking job opportunities (29).

In another study conducted among 530 medical students, a high level of emotional exhaustion was observed, particularly higher among women ($p < 0.01$). Furthermore, a positive and statistically significant correlation was identified between emotional exhaustion and perceived stress ($r = 0.576$; $n = 527$; $p < 0.001$), indicating that students experiencing higher levels of stress also exhibit greater academic burnout (30).

Burnout Syndrome

Burnout syndrome is characterized by emotional exhaustion, cynicism, and a reduced sense of professional accomplishment (36). It is particularly prevalent among students in health-related fields, such as medicine and nursing. A study conducted in Saudi Arabia found that 27.1% of 218 uni-

versity students presented burnout syndrome, while 79.4% exhibited emotional exhaustion (7).

Various factors contribute to the development of burnout, including family, personal, economic, and contextual aspects, such as academic pressure and high study workload. Interpersonal factors (e.g., sex and age) and environmental factors, such as sense of belonging and social support, also play a role (36). Evidence shows that lack of social support and low sense of belonging increase the risk of burnout among university students (8).

Academic performance also plays a key role. In Saudi Arabia, students with a GPA between 3.51 and 4.00 had a lower risk of burnout compared to those with a GPA ≤ 2.0 ($p = 0.039$) (7). Additionally, empathy has been associated with burnout; first-year students have been found to present higher levels of burnout compared to fourth-year students ($p < 0.01$) (35).

To mitigate the impact of burnout, multidisciplinary strategies have been developed focusing on improving learning environments and strengthening mental health support. Training programs in empathy and stress management have been shown to be effective in reducing burnout among medical students (8).

Effect of Mitigation Strategies

The impact of workload and emotional exhaustion on future healthcare professionals is a growing concern, as it affects both mental well-being and academic performance. Various studies have explored the use of coping strategies and other interventions to reduce these effects, yielding mixed results regarding their effectiveness. These strategies enable individuals to cope with adverse events and manage stress, which is essential for healthcare personnel given the demands of their profession.

Resilience, associated with factors such as extracurricular activities, physical exercise, and positive interpersonal relationships, is linked to better academic and professional adaptation, whereas its absence is associated with higher stress levels and personal difficulties (16). The following studies describe different approaches in this context.

At a university in Brazil, a study investigated whether an intervention using flower essences could reduce emotional tension in nursing students, a group particularly vulnerable due to the high demands of their training. Participants consumed four drops of the preparation four times daily for 60 days. Although no significant differences were observed between groups in terms of stress reduction, both reported a meaningful decrease, suggesting

that participation in the study itself, regardless of the treatment, may have positively influenced students' perception of stress (37).

A similar study combining aromatherapy and music therapy reported effective results in improving performance and reducing anxiety and stress levels (37). Other studies have included animal-assisted interventions, which have been reported as more engaging and beneficial programs (38).

Additionally, coping techniques used by medical students to manage stress and mental health issues during training have been examined. This review analyzed a wide range of studies and identified that strategies such as seeking support, active coping, acceptance, and recreational activities are fundamental for improving mental health and academic performance. Despite its thorough approach, some limitations were noted, including the exclusion of articles in other languages and the underrepresentation of certain regions, highlighting the need for more diverse research to achieve a holistic understanding of medical students' needs (15).

Overall, these studies emphasize the importance of further research in this area, as well as the implementation of coping strategies and supportive therapies within educational programs for health sciences students. Although flower essences were not shown to be more effective than placebo, the reduction of stress in both groups suggests that participation alone may have a positive effect. These findings, along with previously described active coping strategies, underscore the importance of combined approaches. Future research should focus on developing comprehensive support programs tailored to students' needs in different settings.

Mindfulness

Mindfulness aims to achieve a state of present-moment awareness in an intentional and non-judgmental manner, through techniques such as meditation, yoga, and introspection, to enhance self-awareness, self-compassion, mood, and problem-solving abilities (3). A meta-analysis concluded that this strategy helps mitigate chronic stress and improve mental health (24), a finding supported by multiple studies.

For example, in a study conducted at a university in the United Kingdom, eight weekly sessions based on the book Mindfulness: A Practical Guide to Finding Peace in a Frantic World were implemented, resulting in a significant reduction in psychological distress ($p < 0.001$ post-intervention and $p = 0.003$ at one-year follow-up) (10). Similarly, mindfulness has been found to be inversely associated with stress levels, while also promoting empa-

thy and emotional well-being (23, 26). It has also been suggested that this technique acts as a protective factor against stress in high-pressure environments (26).

Its impact on academic performance has been analyzed in various studies. A clinical trial involving 143 students, assessed at three time points (before clinical practice, after the intervention, and six months later), showed a significant reduction in stress ($p < 0.0001$), although the beneficial effect on academic performance was transient ($p = 0.0014$) (11). A systematic review and meta-analysis of 10 clinical trials demonstrated improvements in attention-related stress ($p < 0.05$), although without clinical relevance due to small changes in scales such as the Depression Anxiety and Stress Scale-21 (DASS-21) and the Perceived Stress Scale (PSS-10) (12). However, no significant evidence has been found that mindfulness reduces depression, anxiety, or burnout (13).

In another study conducted with 362 medical students, a significant reduction in perceived stress was observed ($\beta = -2.57$; 95% CI [-4.02; -1.12]; $p = 0.004$), along with improvements in emotional regulation and resilience (31). In line with these findings, the usefulness of the Mindfulness-Based Stress Reduction (MBSR) program has been highlighted for reducing stress, anxiety, and depression in medical students (25).

However, these studies have limitations. It has been noted that discontinuation of practice after program completion, low participation due to voluntary sampling, and lack of long-term follow-up limit the generalizability of the results (3, 12, 13, 23). To validate the effectiveness and sustainability of mindfulness, randomized controlled trials and longitudinal studies are needed to confirm its impact on mental health and academic performance.

Conclusions

The findings of this review indicate that stress and emotional exhaustion are common among healthcare trainees, driven by heavy academic workload, pressure for academic performance, and demanding clinical practice. In addition, factors such as distance from family and financial difficulties exacerbate this situation, as reported in studies on burnout syndrome.

Consequently, the effects of stress on students' physical and psychological well-being compromise their overall health, which may negatively impact the quality of patient care. Furthermore, if mental health issues are not adequately addressed during the training stage, they may persist and likely worsen over time. This problem may also be reflected in the health-

care system, with increased absenteeism, reduced productivity, and even the potential for malpractice.

Therefore, it is essential for educational institutions to implement effective strategies to reduce stress and promote healthy habits, including psychological support programs and a proper balance between academic and personal life. These interventions would not only benefit students but also contribute to improving the quality of care they will provide in the future and to strengthening a more efficient and humane healthcare system.

Additionally, the development of longitudinal studies and randomized controlled trials is recommended to more accurately evaluate the effectiveness of these interventions. Overall, several personal factors contributing to the impact of academic stress on the well-being of healthcare students were identified, as well as strategies that have demonstrated positive effects.

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