

BURNOUT ENTRE ESTUDANTES DE MEDICINA: FATORES DE RISCO, CONSEQUÊNCIAS E

ESTRATÉGIAS DE PREVENÇÃO: UMA REVISÃO DA LITERATURA

BURNOUT AMONG MEDICAL STUDENTS: RISK FACTORS, CONSEQUENCES, AND

PREVENTION STRATEGIES: A LITERATURE REVIEW

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ABSTRACT

Objective: to review the literature on burnout among medical students, focusing on associated risk factors, academic and personal consequences, and prevention strategies. Method: narrative/integrative literature review based on PubMed, SciELO, LILACS and BVS, with emphasis on systematic reviews, meta-analyses and original studies published in English and Portuguese. Results: burnout is common during medical education, although estimates vary substantially according to country, instrument and diagnostic criteria. A 2022 meta-analysis of 42 studies involving 26,824 undergraduate medical students estimated an overall prevalence of 37.23%. Academic overload, sleep problems, financial difficulties, low social support, negative life events and dissatisfaction with medical training are repeatedly described as relevant factors. Burnout is associated with poorer mental health, impaired academic functioning, reduced empathy and greater risk of suicidal ideation. Conclusion: prevention requires more than individual coping strategies. Medical schools should combine early identification and accessible support with changes in the learning environment, workload, curriculum and institutional culture.

Keywords: Burnout; Medical students; Medical education; Mental health; Prevention.

1 INTRODUCTION

Medical education is characterized by sustained academic demands, frequent examinations, long study periods, exposure to illness and death, competitive environments and progressive responsibility for patient care. These conditions can affect students' psychological well-being and may contribute to the development of burnout. The phenomenon has received increasing attention because distress during medical school may interfere with learning, professional development and the transition to clinical practice.^{1,2}

Burnout is commonly described through three dimensions: emotional exhaustion, depersonalization or cynicism, and a reduced sense of personal accomplishment. The World Health Organization includes burnout in ICD-11 as an occupational phenomenon rather than a medical condition, defining it in relation to chronic workplace stress. When the concept is applied to medical students, however, the literature uses several instruments and adaptations, which contributes to considerable variation in prevalence estimates.³

Systematic reviews demonstrate that burnout is not restricted to a particular educational system. Erschens et al. identified substantial heterogeneity in studies of medical students, while Frajerma et al. estimated a prevalence of 44.2% among students before residency. More recently, Almutairi et al. pooled 42 studies with 26,824 students and estimated an overall prevalence of 37.23%, with emotional exhaustion, depersonalization and reduced personal accomplishment also occurring at substantial rates.^{1,4,5}

The variation among studies should be interpreted carefully. Differences in the definition of burnout, measurement tools, cut-off points, academic stage, country and sampling methods can produce very different estimates. Therefore, a single prevalence value should not be interpreted as universal. Even so, the consistency of findings across reviews supports the conclusion that burnout represents an important problem in medical education.^{1,4,5}

The present review aims to synthesize evidence regarding burnout among medical students, emphasizing risk factors, consequences and prevention strategies described in the literature. The intention is to organize current evidence in a clinically and educationally useful manner while recognizing the methodological limitations of the available studies.

2 METHOD

This study is a narrative/integrative literature review based on scientific publications concerning burnout in medical students. Searches were performed using PubMed, SciELO, LILACS and BVS as the principal databases, with complementary consultation of reference lists from relevant systematic reviews and meta-analyses. The main descriptors included “burnout”, “medical students”, “medical education”, “stress”, “well-being”, “risk factors” and “prevention”, combined according to the search strategy of each database.

Priority was given to systematic reviews, meta-analyses and original studies addressing prevalence, associated factors, consequences or interventions for burnout among undergraduate medical students. Publications in English and Portuguese were considered, with particular attention to studies providing validated measures and clearly described samples. Studies focused exclusively on physicians or residents were not used to establish medical-student prevalence, although they were considered when they contributed to the broader discussion of prevention in medical education.

Because this was a literature review and did not involve direct research with human participants, no submission to a Research Ethics Committee was required.

3 RESULTS AND DISCUSSION

3.1 EPIDEMIOLOGY AND RISK FACTORS

The available evidence indicates that burnout is frequent among medical students, but its reported prevalence varies widely. Erschens et al. reported that estimates ranged from 7.0% to 75.2% across the literature, largely reflecting differences in instruments and diagnostic thresholds.⁴ Frajerman et al., in a meta-analysis of 24 studies including 17,431 medical students, estimated current burnout at 44.2%.⁵ Almutairi et al. subsequently identified 42 studies and 26,824 students and estimated a pooled prevalence of 37.23%, with high statistical heterogeneity.¹

The most frequently described risk factors are related to the academic environment and the student's psychosocial context. Heavy examination schedules, high academic expectations, competition, repeated assessments and difficulties balancing study with personal life may increase chronic stress. Reviews also identify sleep problems, financial difficulties, negative life events, low social support, dissatisfaction with medical training and poor motivation as important predictors or correlates of burnout.^{2,6}

Academic stage may also influence vulnerability. Some studies report increasing burnout as students progress through medical school, particularly when they enter clinical rotations and encounter greater responsibility, uncertainty and exposure to suffering. However, findings are not completely consistent, and the direction and magnitude of this association differ between settings.^{1,4,7}

Individual characteristics should not be separated from the educational context. A systematic review of medical students in China found that poorer psychological functioning, lower social support and aspects of the living environment were associated with burnout. The authors emphasized that social and contextual determinants remain understudied compared with individual characteristics.⁷ This is relevant because interventions aimed only at teaching students to cope may leave the underlying sources of chronic stress unchanged.

3.2 CONSEQUENCES FOR MENTAL HEALTH AND ACADEMIC FUNCTIONING

Burnout is associated with a broader pattern of psychological distress. Reviews of medical students describe links with depression, anxiety, sleep difficulties and maladaptive substance use, although the cross-sectional nature of many studies limits conclusions about causality.⁸ In Brazilian medical students, a systematic review and meta-analysis found substantial prevalence of several mental health problems, including stress, depression, anxiety, poor sleep quality and burnout, illustrating the wider burden of psychological symptoms in this population.⁹

The relationship with academic functioning is also clinically relevant. Burnout can be accompanied by reduced motivation, concentration difficulties and a diminished sense of academic efficacy. Recent systematic evidence indicates that psychosocial distress, including burnout, tends to be associated with poorer academic outcomes, although the available evidence does not establish a simple causal pathway.¹⁰

3.3 CONSEQUENCES FOR PROFESSIONAL DEVELOPMENT AND PATIENT CARE

Medical school is also a period in which professional identity and attitudes toward patients are being formed. Burnout may therefore have consequences that extend beyond grades and personal well-being. Research has associated burnout with reduced empathy, which is particularly important because empathy is a central component of communication and patient-centered care.¹¹

A 2024 systematic review and meta-analysis involving 21 studies and 27,129 medical students found a statistically significant negative association between empathy and burnout. Cognitive empathy was negatively associated with emotional exhaustion and depersonalization and positively associated with personal accomplishment. These findings do not prove that burnout causes loss of empathy, or that greater empathy prevents burnout, but they support the importance of maintaining an educational environment in which both student well-being and humanistic skills can develop.¹¹

Another concern is the association between burnout and suicidal ideation. In a meta-analysis of risk factors for suicidal ideation and suicide attempts among medical students, burnout was associated with substantially higher odds of suicidal ideation. This association reinforces the need to treat severe burnout as an important warning sign rather than as a normal or unavoidable part of medical training.¹²

These consequences should not be interpreted as evidence that every student with burnout will develop a psychiatric disorder or professional impairment. Instead, the literature supports a multifactorial model in which burnout coexists with other forms of distress and may signal an educational environment in which demands exceed available resources. For this reason, prevention should combine individual support with institutional changes.

3.4 PREVENTION AND INTERVENTION STRATEGIES

Interventions for burnout among medical students can be grouped into individual, educational and organizational approaches. Individual strategies include counseling, psychological support, physical activity, sleep promotion, stress-management techniques and mindfulness. Educational strategies include curriculum reform, mentoring, peer support and improved academic planning. Organizational strategies address workload, scheduling, assessment practices, access to mental health services and the broader culture of the medical school.^{6,13}

The evidence for mindfulness-based interventions has become more consistent, although it remains limited by differences in study design. Hathaishaard et al. reviewed randomized controlled studies and found that mindfulness interventions reduced subjective stress in medical students both immediately after the intervention and at six-month follow-up.¹³

More recently, Wang et al. synthesized nine studies involving 810 medical students. Their meta-analysis found small to moderate improvements in overall burnout in randomized trials, as well as improvements in emotional exhaustion and academic efficacy. Nevertheless, the authors highlighted concerns regarding risk of bias and the limited quality of the evidence, indicating that mindfulness should be considered one component of a broader prevention strategy rather than a stand-alone solution.¹⁴

Institutional interventions are equally important because burnout is influenced by the structure of medical training. A systematic review of interventions to prevent or reduce burnout among medical students and residents found that the evidence base was relatively small and that few studies were specifically designed to prevent burnout. Among studies reporting significant benefits, interventions included complementary approaches, meditation and changes in duty hours, suggesting that modifications to the learning environment can be relevant.¹⁵

The most appropriate prevention model is therefore likely to be multilevel. Medical schools should provide confidential and easily accessible mental health services, normalize help-seeking, monitor students at risk and establish clear pathways for referral. At the same time, schools should examine academic workload, assessment density, scheduling, clinical supervision and the quality of interpersonal relationships within the institution. A culture that treats exhaustion as a sign of commitment may undermine the effectiveness of individual wellness programs.

Prevention should also begin before severe symptoms emerge. Orientation programs, mentoring, peer-support groups and regular opportunities for students to discuss difficulties may improve early recognition. Screening tools can help identify students who need further assessment, but screening should not replace clinical evaluation or be used as a substitute for improving the educational environment.^{6,15}

Finally, future research should prioritize longitudinal and multicenter designs, standardized definitions and validated measurement instruments. The heterogeneity of prevalence estimates makes comparisons difficult, and many existing studies are cross-sectional. Better evidence is needed to determine which organizational interventions produce durable reductions in burnout and whether improvements in student well-being translate into better educational and clinical outcomes.^{1,4,14,15}

4 FINAL CONSIDERATIONS

Burnout is a frequent and clinically relevant phenomenon among medical students. Although prevalence estimates differ substantially across studies, systematic reviews consistently indicate that a considerable proportion of students experience emotional exhaustion, cynicism or reduced academic accomplishment during medical training. Academic overload, sleep difficulties, financial and personal stressors, low social support and dissatisfaction with the learning environment are repeatedly identified as important associated factors.

The consequences extend beyond temporary tiredness. Burnout is associated with poorer mental health, difficulties in academic functioning, reduced empathy and a higher risk of suicidal ideation. These findings support the need to recognize burnout early and to avoid presenting it as an inevitable component of becoming a physician.

Preventive strategies should combine accessible psychological support with changes in the educational environment. Mindfulness and other individual interventions can be useful, but current evidence does not justify relying on them alone. Institutional measures involving workload, scheduling, mentoring, academic support and a culture that encourages help-seeking are essential. A sustained, multilevel approach is more consistent with the multifactorial nature of burnout and may contribute to healthier medical education and safer future clinical practice.

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