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A review on dental environment stress among dental students and factors affecting them

Abstract

Dental students must study in a very challenging setting since the field demands regular patient connection, in-person practice, and both theoretical and clinical expertise. Stress among dental students is a well-documented issue that significantly affects their academic performance, mental health, and overall well-being. They encounter a variety of stressors during their school years, including demanding schedules, high workloads, and the need to balance studying fundamentals with developing technical clinical abilities. Other pressures, such managing patients, taking responsibility for patient care, and having trouble learning manual skills, surface during the clinical period. This review explores the prevalence, sources, and consequences of stress among dental students globally. It also evaluates coping mechanisms and institutional interventions aimed at mitigating stress. A systematic literature search was conducted across PubMed, MEDLINE, PsycINFO, and Cochrane Library for studies published. The findings highlight academic, clinical, and interpersonal stressors, gender differences, and regional variations in stress levels. The review underscores the need for institutional reforms, faculty training, and structured mental health support programs.

Keywords: dental students, mental health, stress

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Introduction

Dental education is widely acknowledged as one of the most demanding academic fields, often leading to high levels of stress among students.[1,2] The rigorous curriculum requires students to develop both theoretical knowledge and practical clinical skills while managing patient care under close supervision.[3,4] As a result, stress has become a major concern within dental schools, impacting students' mental and physical well-being.[5,6]

Academic pressure remains one of the primary contributors to stress among dental students.[7,8] Heavy coursework, frequent examinations, and performance expectations can overwhelm students, leading to anxiety and burnout.[9] The transition from preclinical to clinical training presents additional challenges, as students must apply their theoretical knowledge to real patient care while adhering to strict clinical requirements and competency assessments.[10,11]

Furthermore, interpersonal relationships with peers and faculty play a crucial role in stress levels among dental students.[12,13] Peer competition, faculty expectations, and communication challenges can contribute to stress and anxiety.[14,15] Studies indicate that female dental students generally report higher stress levels than their male counterparts, possibly due to gender-specific societal pressures and emotional sensitivity.[16,17]

The consequences of chronic stress among dental students are significant. Studies suggest that prolonged stress can lead to burnout, depression, and decreased academic performance.[4] Additionally, stress has been associated with physical symptoms such as headaches, musculoskeletal pain, and gastrointestinal issues.[5,6] If not managed effectively, stress may also impact professional competence, leading to long-term career dissatisfaction and reduced patient care quality.[10,11]

Recognizing the detrimental effects of stress on dental students, many institutions have introduced stress management programs and institutional reforms aimed at alleviating stress.[1,4] These include mindfulness training, faculty mentorship programs, and peer support networks.[18] However, the effectiveness of these interventions remains an area of active research, with mixed findings regarding their long-term benefits.[19]

This systematic review aims to comprehensively analyze the sources, effects, and coping mechanisms of stress among dental students, based on existing literature. It also explores institutional interventions that may help reduce stress and promote student well-being.

Materials and methods

This review included studies published in peer-reviewed journals from 2010 to 2024. This review included research articles, systematic reviews, and meta-analyses focusing on stress among undergraduate dental students. Studies employing validated stress assessment tools, such as the Dental Environment Stress (DES) questionnaire, Perceived Stress Scale (PSS), General Health Questionnaire (GHQ), and Depression, Anxiety, and Stress Scale (DASS-21). Studies conducted in various geographical regions to ensure diverse representation.

The review excluded studies focusing on practicing professionals, Non-empirical articles (e.g., editorials, commentaries, and opinion pieces) and studies evaluating stress in non-dental health professions.

Search strategy

A systematic literature search was conducted in PubMed, MEDLINE, PsycINFO, and Cochrane Library. The following keywords and Boolean operators were used "Dental students" AND "Stress", "Dental education" AND "mental health" and "Stress assessment" AND "dental training".

Study selection

The study selection included Title and abstract screening by two independent reviewers. This was followed by Full-text review of eligible studies and then Quality assessment using the Newcastle-Ottawa Scale (NOS). Studies scoring 7 or more on NOS were considered high quality, while those scoring 5–6 were rated moderate quality. Studies with scores below 5 were excluded.

Results

The systematic review included studies from diverse geographic regions. The prevalence of stress among dental students ranged from 60% to 90%, with variations based on gender, academic year, and institutional curriculum.

Prevalence of stress

Higher prevalence in final-year students compared to first-year students, likely due to clinical workload and licensing examination pressure. Some studies have shown that female students might have higher stress levels than male students which could be attributed to females being more emotionally sensitive. Students in private institutions exhibited more financial stress than those in public institutions due to higher tuition fees and living expenses.

Primary stressors identified

The Primary Stressors Identified were Academic Stressors: Heavy coursework, frequent exams, lack of study time, and pressure to perform, Clinical Stressors: Managing real patients, meeting competency requirements, and supervisor pressure and Interpersonal Stressors: Peer competition, faculty relationships, and financial burdens.

Psychological and physiological impact

Increased anxiety and depression rates were noted among students with persistent high stress levels, leading to emotional exhaustion and burnout. Physical manifestations of stress included headaches, insomnia, gastrointestinal issues, and musculoskeletal pain, especially in students handling complex clinical cases. Burnout syndrome prevalence was highest in final-year students, significantly impacting their motivation and career aspirations.

Coping strategies among students

Effective coping mechanisms included time management, exercise, meditation, and seeking peer or faculty support. Maladaptive coping strategies such as substance use (caffeine, smoking, alcohol) and avoidance behaviors were noted in some studies, exacerbating stress levels. Institutional Support Initiatives such as peer mentoring, psychological counseling services, and mindfulness-based interventions showed promising results in reducing student stress levels.

Discussion

Stress among dental students is a multifactorial issue influenced by academic, clinical, and interpersonal stressors.[20,21] Academic workload remains a primary concern, with heavy coursework and frequent exams contributing to heightened stress levels.[22,23] Students often experience performance anxiety, particularly in competitive academic environments where grades significantly impact future career opportunities.[24]

Dental students' academic performance and the standard of patient care are both impacted by stress and emotional weariness. Furthermore, emotional tiredness and stress can lead to other psychological diseases including depression, which can raise the risk of suicide and cause school dropout.[25-27] Other research on university students' experiences with these kinds of problems has mostly concentrated on confirming the validity of current tools for assessing burnout, emotional weariness, and perceived stress.[28]

Clinical stressors arise when students transition from preclinical coursework to direct patient care.[29] Many students report anxiety over patient interactions, fear of making clinical errors, and pressure from faculty evaluations.[30,31] The demand for technical proficiency, coupled with limited clinical exposure, adds to their stress burden.[32]

Interpersonal relationships also play a critical role in student stress levels. Studies indicate that faculty-student interactions can either support or exacerbate stress, depending on the quality of mentorship and feedback.[33]

Gender differences have been observed in stress perception, with female students reporting higher stress levels than their male counterparts.[34] Female students' propensity and desire to more freely communicate their views and feelings might be the reason for the higher reported stress levels among them. Their reported greater stress levels may be a result of their desire to express oneself, especially when it comes to unpleasant ideas and sentiments.[23,35]

As a component of the National Task Force on Mental Health and Well-Being of Medical Students, NMC of India carried out a Pan-India research of medical college students. According to 50.9% of respondents, the family environment is very supportive, 34.6% supportive, and 4.5% unsupportive. Though most students feel supported at home, some students (15.5%) reported feeling academic pressure from their family frequently or regularly, and 30.2% occasionally. Just 1.5% of students think their academic workload is light or very light, but the majority (56.6%) think it is appropriate yet substantial. Twenty-seven percent think it is excessively heavy. 51.6% of undergraduate students agree or strongly agree that their performance is negatively impacted by their fear of failing, making it a significant issue.[36]

Chronic stress leads to both psychological and physiological consequences. High levels of stress are associated with anxiety, depression, and emotional exhaustion.[37] Physical symptoms, such as headaches, insomnia, and gastrointestinal distress, are commonly reported among stressed dental students. Without appropriate intervention, prolonged stress can impact academic performance, clinical efficiency, and overall well-being.[38]

Fourth-year students have noticeably higher rates of depression. These rates might be a reflection of both academic burden and the uncertainty around future employment and career opportunities.[39] The material now in publication, however, offers a binary viewpoint about the scholastic years that are most closely linked to elevated levels of these illnesses. While some study provides conflicting results, other studies propose a single stage of academic life.[40-42]

Institutional interventions have been introduced to help students manage stress. These include mindfulness training, faculty mentorship, structured stress management workshops, and peer support programs.[10] Studies have shown that structured stress management programs can significantly reduce anxiety levels and improve student well-being. However, further research is required to assess the long-term effectiveness of these interventions.

Qualitative methods aimed at dentistry students are particularly significant as they often enable the gathering of in-depth information and firsthand accounts of people's experiences.[43] Long-term research circumstances can be improved with the use of these insights. Twelve final-year dentistry students were asked about their experiences with a mentorship program that had been put in place at the institution in one qualitative research conducted in Denmark (44). Numerous studies have also examined the perceived effects of particular interventions from the viewpoint of the students themselves (e.g., yoga sessions,[45] a risk-oriented prevention educational concept,[46] the inclusion of self-care techniques in the curriculum,[47] mind-body wellness training,[78]

or a stress-reduction technique based on cognitive reappraisal.[49] For medical studies, there are additional thorough studies that include stressors and student-recommended solutions.[50,51]

In addition to revealing stressful domains (performance pressure, workload, and clinical training), a recent mixed methods study offered more thorough insights into dental and endodontic-related stress in undergraduate students. It also revealed suggestions for student improvement (e.g., introducing a patient management team, including more laboratory sessions in the curriculum to practice more, more support with administrative work, or first-year and second-year students helping students in higher semesters to provide more assistance for them and teach students from first semesters practical knowledge early on).[7]

Conclusion

Stress among dental students is a global concern, affecting mental health and professional development. Addressing stress requires curricular reforms, faculty training, and student wellness programs. Future research should focus on longitudinal studies and intervention trials to identify effective stress management strategies.

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Conflicts of interest

The authors declare that there are no conflicts of interest.

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