Review Article

Global Research Landscape on the Mental Health of Dental Students: A Bibliometric Analysis (2000–2025)

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ABSTRACT

Dental students often face high academic workloads, clinical demands, and performance pressures, which can lead to significant psychological stress. Understanding research trends in this area can guide strategies to protect student well-being. This study examined the global research landscape on the mental health of dental students, focusing on the most cited studies published between 2000 and August 2025. The bibliometric analysis was conducted using the Dimensions database. The search included terms related to mental health, stress, anxiety, depression, and burnout in dental students. Out of 1403 articles obtained after applying a filter for publication type and time, the 500 most cited articles were screened manually, and 367 met the inclusion criteria. Data were analyzed using Biblioshiny to identify publication trends, geographical distribution, influential journals, most cited articles, and thematic evolution. Research output increased steadily over the years, peaking in 2021, followed by a decline. Saudi Arabia, India, and the United States produced the largest share of highly cited studies. The Journal of Dental Education was the most frequent publishing journal. Thematic evolution showed a shift from early focus on attitudes and academic environment to more recent emphasis on burnout, psychological stress, and measurable health impacts such as bruxism and reduced quality of life. COVID-19–related mental health issues were a major theme between 2019 and 2020. Most highly cited studies were cross-sectional surveys, with recent years showing more review articles. The findings highlight the need for more intervention-based, longitudinal, and multicenter studies to support evidence-based mental health strategies for dental students worldwide.

Keywords

Dental students; Mental health; Stress; Anxiety; Depression; Burnout; Psychological distress; Bibliometric analysis; Research trends; Academic stress; Perceived stress

INTRODUCTION

Dental education demands high levels of precision, patience, and endurance due to high academic workloads, examinations, and prolonged preclinical or clinical working hours [1]. Several studies have highlighted that dental students often report higher levels of psychological distress compared to students in other health-related disciplines due to highly demanding clinical training [2,3]. Studies have shown that females feel professional burnout more frequently [4,5], whereas in a large multi-site study of US dental students, female students reported significantly greater emotional exhaustion, and male students reported higher depersonalization [6].

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Bangladesh Journal of Medical Science Vol. 24 No. 04 October'25

DOI: https://doi.org/10.3329/bjms.v24i4.84671

Common stressors include fear of academic failure, pressure from clinical performance, difficulties with time management, and the need to meet patients' expectations. Long-term exposure to stressors may lead to adverse outcomes, including emotional exhaustion, decreased academic performance, a lack of accomplishment, low self-esteem, and depersonalization [7-11]. Moreover, these stressors can take a significant toll on their mental well-being, increasing the risk of stress, anxiety, depression, and burnout [12-15]. If left unaddressed, this mental stress may persist into professional practice, contributing to early career burnout and a decline in the quality of patient care [16]. Furthermore, a study demonstrated a statistically significant association between burnout and depression, and between depression and suicidal ideation. However, no association was found between burnout and suicidal ideation [17]. It is, therefore, essential to understand the psychological challenges faced by dental students and to encourage awareness of mental health, coping strategies, and institutional support systems to promote students' well-being [18].

Although numerous empirical studies have examined stress, burnout, anxiety, and depression among dental students, most have been confined to single institutions, limited geographical settings, or specific mental health outcomes [19-21]. Existing reviews are largely narrative or systematic in nature, focusing on prevalence rates or intervention outcomes without mapping the broader research landscape. To date, there is no comprehensive bibliometric analysis that provides an overview of global research output, identifies key contributors, maps collaboration networks, and traces thematic evolution in this field.

This lack of bibliometric analysis creates three major gaps: (1) the absence of a consolidated overview of global publication trends and research hotspots, (2) insufficient understanding of cross-country collaborations and the influence of landmark publications, and (3) limited insight into underexplored themes that could guide future research agendas. With limited insights into emerging trends, focus areas, and underexplored gaps, researchers and stakeholders lack a clear guide for setting future research or policy priorities. A bibliometric analysis offers a robust way to bridge this gap by examining patterns of authorship, themes, and geographical distribution of research and thereby providing guidance on future research, resource planning, and policy making [22]. This bibliometric study aims to systematically analyze the global research output on the mental health of dental students with the following objectives:

1. To examine publication and citation trends.
2. To explore the geographical distribution of the research.
3. To identify influential journals and landmark publications.
4. To examine the thematic evolution

By providing an overview of the research landscape on dental students' mental health, this study can help support a more informed approach for protecting the well-being of dental students worldwide.

MATERIALS AND METHODS

Study Design and Data Source

This bibliometric analysis was conducted to provide an overview of the global research landscape on the mental health of dental students. The data for this study was retrieved on August 2, 2025, using the Dimensions database. Dimensions was selected for this bibliometric analysis because it offers broad coverage of research publications across a wide range of disciplines, including health sciences and psychology. In addition, studies have shown that Dimensions covers over 96% of the journals indexed in both Web of Science and Scopus, which reflects a high level of overlap with these well-established databases [23].

Search Strategy

The search was carried out using the following search string:

("mental health" OR "psychological distress" OR stress OR anxiety OR depression OR burnout) AND ("dental student" OR "undergraduate dental")

The search was limited to research articles published between 2000 and 2025, without any filter for language.

Inclusion and Exclusion Criteria

The inclusion criteria were as follows:

- Articles focusing on the mental health, psychological stress, anxiety, depression, their management, psychological stressors, or emotional well-being of dental students.
- Peer-reviewed original research articles or systematic reviews.
- Articles published between 2000 and August 2025.

The exclusion criteria were:

- Studies focusing on medical, nursing, or paramedical students, unless dental students were clearly distinguished.
- Studies focusing on dental hygienists.
- Book chapters.
- Studies on dental professionals that do not include dental students.

Data Extraction and Analysis

The metadata of the included articles—such as title, authors, year of publication, country, journal, keywords, and citations—was exported in CSV format from Dimensions. Biblioshiny, the web interface of the Bibliometrix R package, was used for descriptive analysis (i.e., most productive journals, most cited articles, geographical distribution of research), trend evaluations (publication and citations per year), and

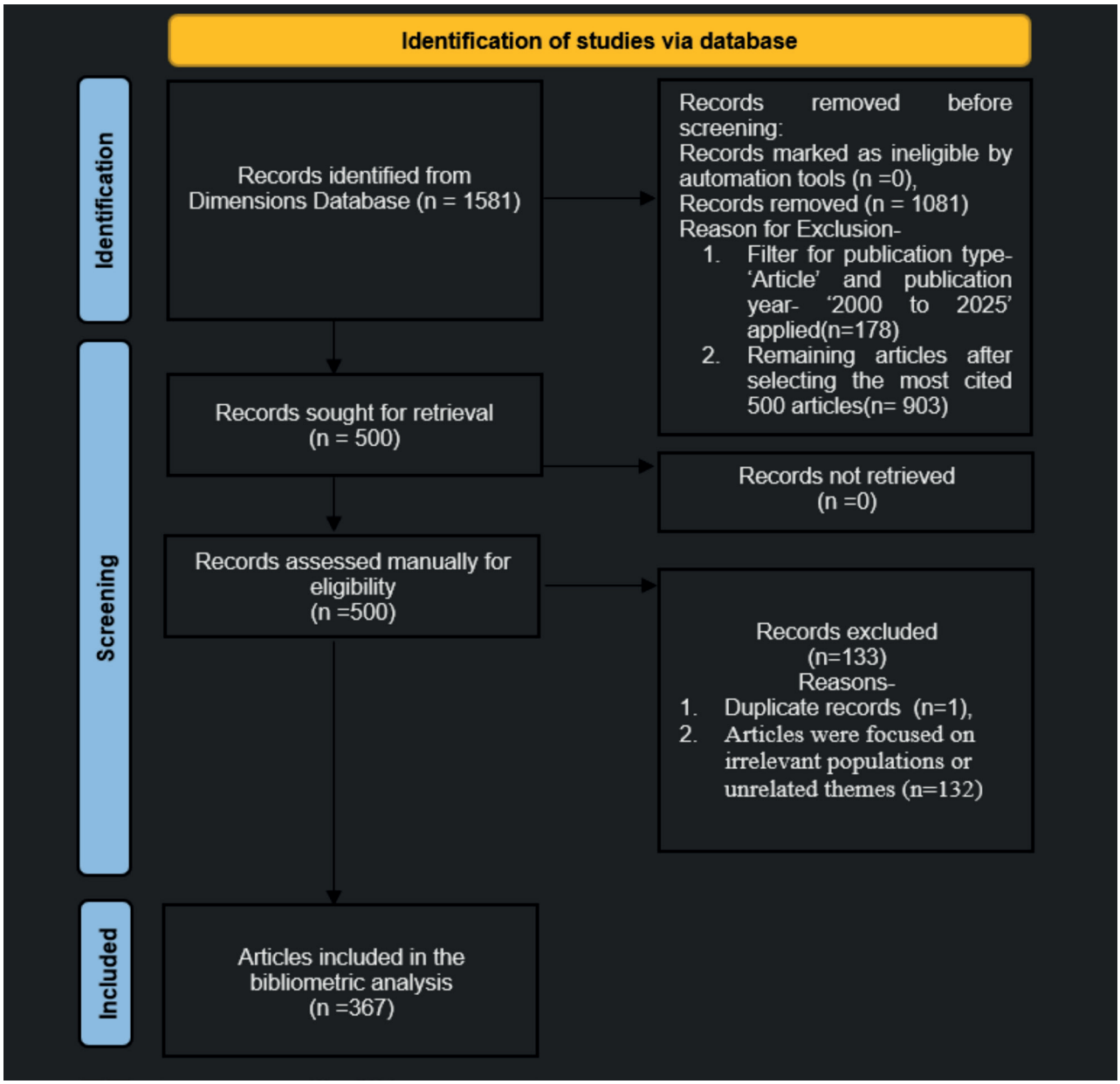

Figure 1: Flow Chart of the Study Selection Process.
Illustration Credit: Namrata Dagli.

thematic evolution (based on titles). The tool is widely used in bibliometric studies for its capability to manage large datasets and produce meaningful visualizations [24].

Study Selection Process

The study selection process was guided by the PRISMA 2020 (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) framework. Although originally developed for systematic reviews, PRISMA [25] was adapted for this bibliometric review to ensure transparent and replicable reporting of the article screening process. A flowchart (Figure 1) illustrates the number of records identified, screened, and included in the final analysis.

Ethical Considerations

This study did not involve human participants or interventions and was based entirely on secondary data retrieved from a public database. Therefore, ethical approval was not required.

RESULTS

When searching the Dimensions database using the search string, 1,581 publications were identified. Of these, 1,456 were published within the last 25 years. After applying the filter for article type, 1,403 articles remained. The 500 most-cited articles were then exported to an Excel file for further analysis. Following manual screening, 367 articles met the inclusion criteria and were retained for the final analysis (Figure 1).

Publication and Citation Trends Over time

Figure 2 presents a year-wise overview of research trends on the mental health of dental students based on data retrieved from the Dimensions database. The year 2021 recorded the highest number of publications (49 articles), reflecting peak research activity in this area. While older articles, such as those from 2002 and 2008, received higher total citations due to longer visibility, recent years like 2020 and 2024 show strong citation rates per year despite limited citable years. From 2016 onwards, there has been a steady rise in publications. A decline in the number of publications is observed after 2021, suggesting a possible saturation or shift in research focus.

Geographical Distribution of Research

Figure 3 illustrates the global distribution of the most cited research articles on the mental health of dental students. The citation patterns suggest the visibility,

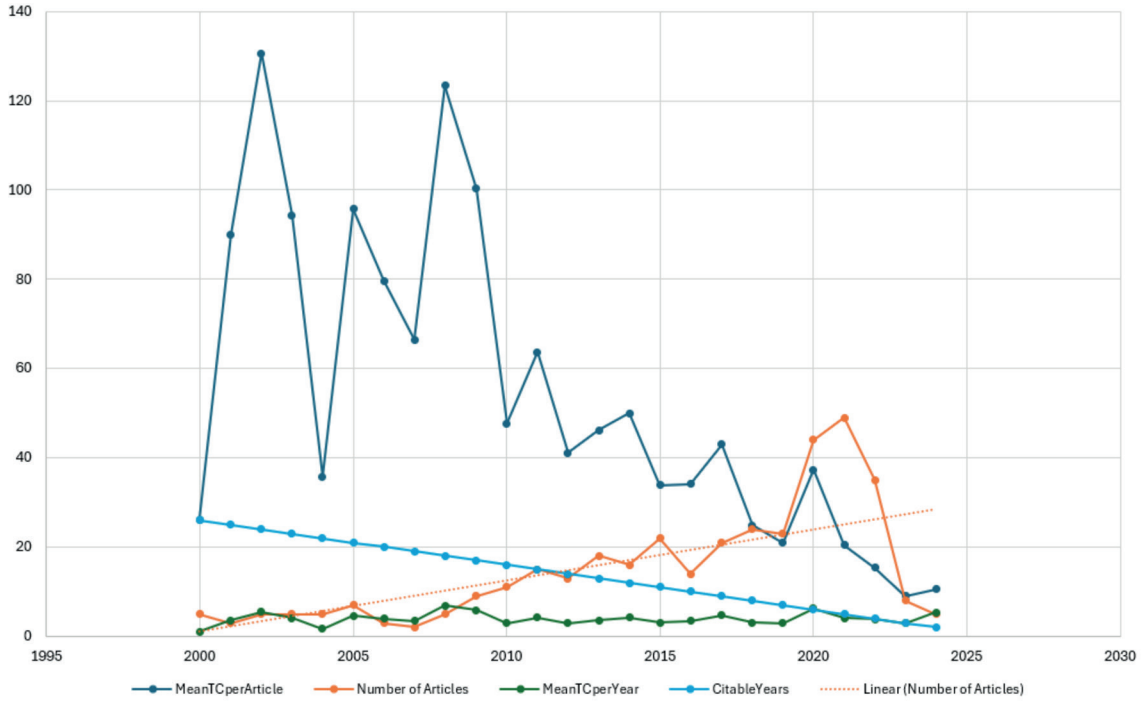

Figure 2: Publication and Citation Trends Over Time (Database- Dimensions).
Illustration Credit: Namrata Dagli.

influence, and perceived relevance of research within the academic community. These patterns may indicate which countries are shaping the discourse or publishing impactful articles. Saudi Arabia leads the field with 168 publications, followed by India (119) and the United States (106). Brazil, Iran, Malaysia, Australia, and Turkey also contributed notably, while Germany, Spain, and Pakistan reflect moderate citation impact. It is important to note that this distribution reflects citation strength, not the total quantity or quality of research produced across all countries.

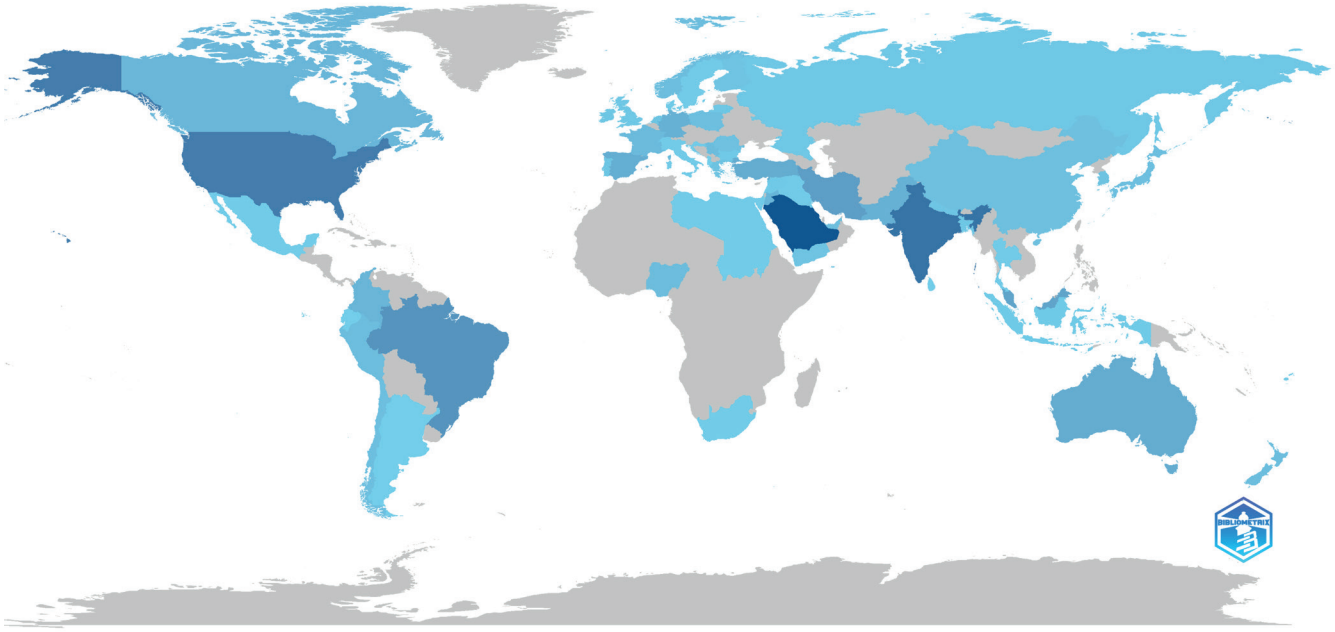

Figure 3: Geographical Distribution of Research on Mental Health of Dental Students (Database- Dimensions). The color gradient in the image represents research productivity on the mental health of dental students, with darker shades indicating higher publication output and lighter shades indicating lower output.
Illustration Credit: Namrata Dagli.

Most Relevant Journals

Figure 4 presents the most relevant journals that have published the most cited articles on the mental health of dental students over the past 25 years. The *Journal of Dental Education* leads with 60 highly cited articles, followed by the *European Journal of Dental Education* with 35. The *International Journal of Environmental Research and Public Health* contributed 15 such articles, while *BMC Medical Education* published 13. Both the *Journal of Education and Health Promotion* and *PLOS ONE* published 6 highly cited articles each, and the *European Journal of Dentistry* contributed 5. Additionally, 4 highly cited articles were published in each of the following journals: *Advances in Medical Education and Practice*, *BMC Oral Health*, *British Dental Journal*, *CRANIO*, *International Dental Journal*, *International Journal of Dentistry*, and the *Journal of the International Society of Preventive and Community Dentistry*.

Most Cited Publications

The ten most cited studies highlight the global interest in understanding the psychological issues faced by dental students (Figure 5). The two systematic reviews combine findings from many sources, offering a clear and comprehensive picture of the stress-related issues, which makes them a common reference point for further research. The cross-sectional and multi-center surveys provide large-scale, real-world snapshots of student well-being, using validated tools and spanning diverse cultural or institutional contexts. Comparative studies, whether between medical and non-medical students or across professional disciplines, help identify which challenges are universal and which are field-specific, guiding targeted interventions. Articles focusing on

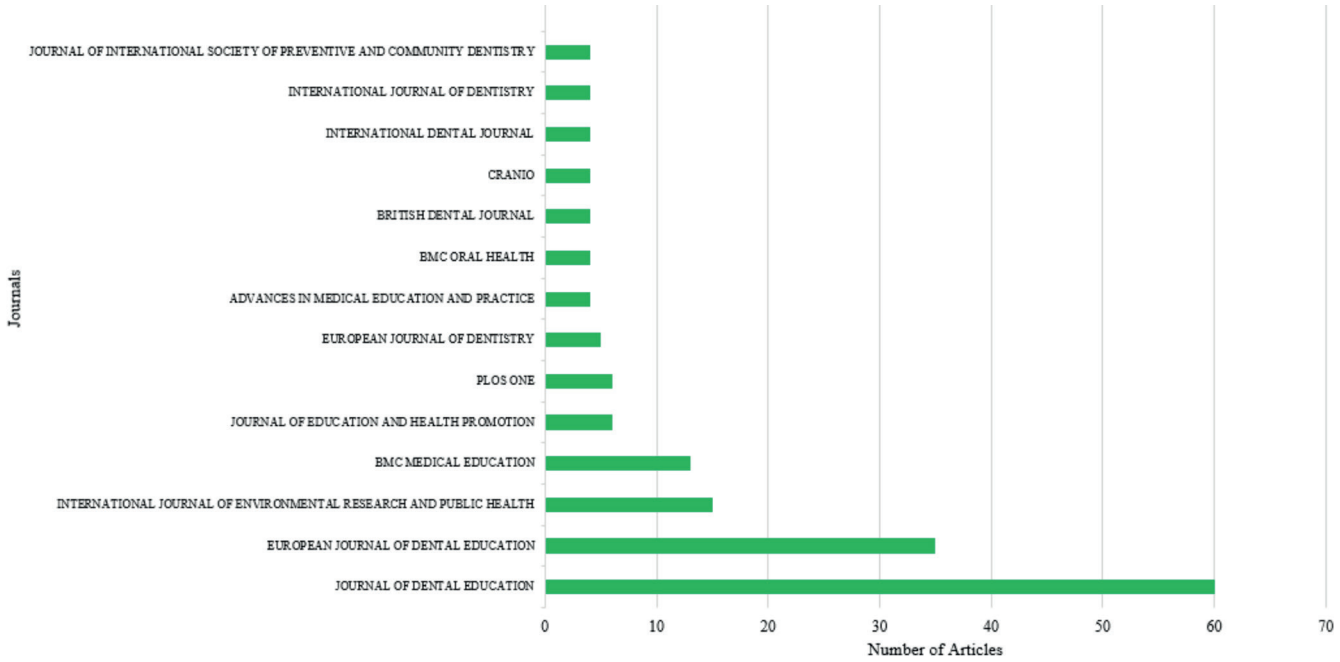

Figure 4: Most Relevant Journals Publishing on Dental Students' Mental Health.
Illustration Credit: Namrata Dagli.

related constructs like emotional intelligence or mindfulness suggest coping strategies and resilience-building approaches. The articles examining clinical training years draw attention to a critical transition period where academic, practical, and emotional demands peak (Table 1).

Table 1: Most Cited Articles on the Mental Health of Dental Students

Title	Type of Study	Focus	Conclusions
Stress amongst dental students: a systematic review [1]	Systematic review	Evidence synthesis on sources, prevalence, and effects of stress in dental students globally.	Dental students consistently report high stress, primarily due to academic and clinical demands; stress can impair performance and well-being.
A Systematic Review of Stress in Dental Students[12]	Systematic review	Collates literature on stress levels, contributing factors, and interventions in dental education.	Stress is prevalent worldwide, with academic workload, examinations, and patient care as key contributors; coping strategies and curriculum changes are needed.
The academic environment: the students' perspective [26]	Cross-sectional survey	Evaluates students' perceptions of their academic environment and its influence on well-being.	A supportive and well-structured academic environment is strongly linked to better student satisfaction and reduced stress.
Depression, anxiety, and stress in dental students [27]	Cross-sectional survey	Assesses the prevalence and severity of depression, anxiety, and stress among dental students.	High rates of depression, anxiety, and stress were found, indicating the need for mental health support within dental programs.
Increased Levels of Anxiety Among Medical and Non-Medical University Students During the COVID-19 Pandemic in the UAE [28]	Cross-sectional survey	Compares anxiety levels between medical and non-medical students during COVID-19.	Anxiety increased significantly in both groups, with non-medical students reporting higher levels during the pandemic.
Emotional Intelligence (EI) and perceived stress in healthcare students: a multi-institutional, multi-professional survey [29]	Cross-sectional multi-institutional survey	Examines the relationship between EI and perceived stress in healthcare students.	Higher EI is associated with lower perceived stress, suggesting EI training could benefit student well-being.
Psychological stress in undergraduate dental students: baseline results from seven European dental schools [7]	Multi-center cross-sectional study	Provides baseline data on stress levels and sources among dental students across Europe.	Stress is widespread, with variation between institutions; workload and clinical responsibilities are the main stressors.

Title	Type of Study	Focus	Conclusions
Teaching mindfulness in medical school: where are we now and where are we going? [30]	Narrative review	Explores current applications and future potential of mindfulness training in medical education.	Mindfulness training can reduce stress and improve focus; integration into curricula is promising but requires more research.
A Comparative Study of Professional Student Stress [3]	Comparative cross-sectional study	Compares stress levels across different professional student groups (e.g., medicine, dentistry).	Stress is high across all professional courses, with dental students often experiencing the highest levels.
Stress, burnout, and health in the clinical period of dental education [10]	Cross-sectional survey	Investigates stress, burnout, and health outcomes in dental students during clinical training years.	Clinical training is associated with significant stress and burnout, impacting health and performance.

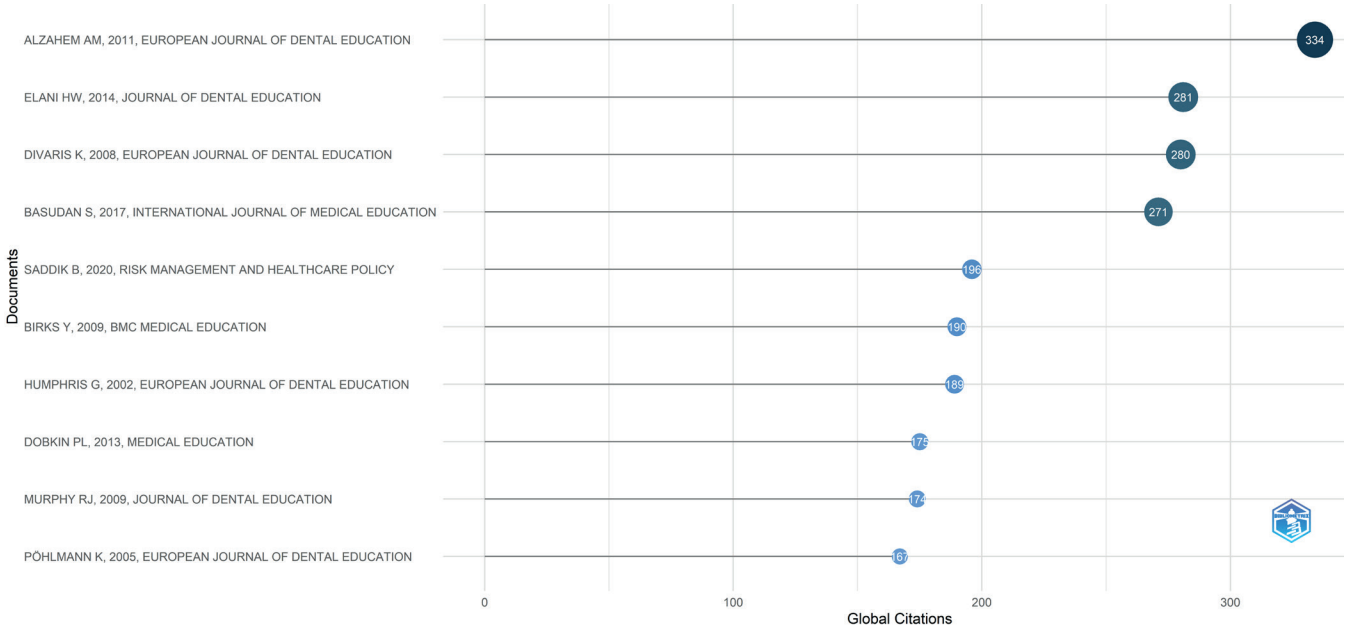

Figure 5: Citations Received by Most Cited Articles on Dental Students' Mental Health.
Illustration Credit: Namrata Dagli.

Thematic evolution

The thematic evolution analysis reveals emerging and declining themes based on terms extracted from article titles (Unigrams) across multiple time spans. From 2000 to 2011, the most cited studies focused broadly on *attitudes of dental students*, and the exploration of *emotional* or *clinical* stress markers. The studies were mainly comparative. In 2012–2015, the emphasis shifted to the *academic environment* and *assessment*, with *school*, *university*, and *environment* becoming prevalent alongside emerging terms like *anxiety* and *psychological, particularly* in *India*. During 2016–2018, high-impact research concentrated on *curriculum*, *burnout*, *addiction*, health, and *prevalence*, particularly in *Saudi*. Most of the studies seem to be survey-based during this period. In 2019–2020, the most frequent emerging themes were pandemic, *COVID*, and *life,* while the most common study type appears to be self-reported. The terms like environment, university, and *anxiety* persisted. By 2021, the focus turned toward *mental health* and lifestyle factors like *sleep*. In 2022–2024, the top-cited studies centered around *psychological stress*, *burnout*, and related outcomes like *bruxism* and *quality of life*, indicating a move away from institutional or pandemic-specific concerns toward direct mental health impacts. The most common study type seems to be reviews during this time (Figure 6).

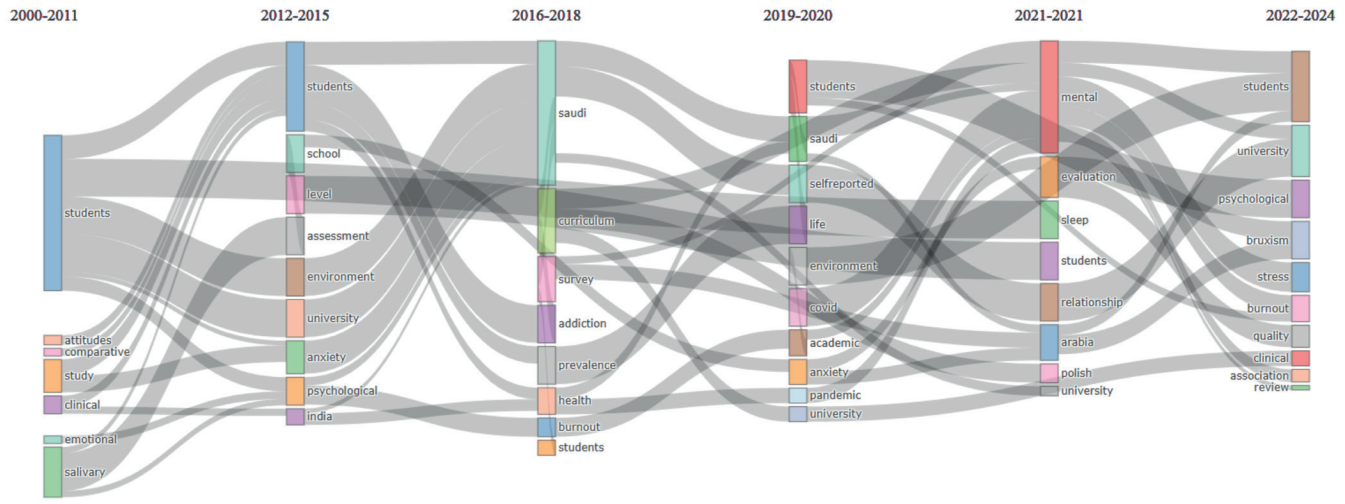

Figure 6: Evolution Of Main Research Themes In The Most Cited Articles On The Mental Health Of Dental Students, Based On Unigram Analysis Of Article Titles.
Illustration Credit: Namrata Dagli

DISCUSSION

The sharp rise in publications after 2015 suggests that mental health among dental students became a growing concern—possibly influenced by increasing academic pressure and global events like the COVID-19 pandemic [31,32]. The high citation rates in recent years, despite fewer citable years, reflect that newer research is timely and resonates with current academic and clinical interests. The decline in publications after 2021 could indicate that the field is stabilizing, or that researchers are shifting focus toward more specific or emerging subtopics within student mental health. High citation counts and steady citation rates per year indicate that the articles remain relevant, not just for historical insight but for guiding current educational practices [33].

The noticeable concentration of the impactful publications in places like Saudi Arabia, India, and the US possibly stems from a convergence of factors: dental education programs, rising awareness of student well-being, and robust research support in these countries. In Saudi Arabia, recent efforts to develop mental health infrastructure alongside medical education reform may have catalyzed research into dental student distress [34,35]. In India, the intense academic competition, frequent mismatches between students' career preferences and actual enrollment in dentistry, and scarce job prospects are the main causes for stress, which require investigation into mental health [36]. Recently, the Ministry of Health and Family Welfare (2025) has highlighted the need to strengthen mental healthcare services, which underscores the importance of addressing these issues among dental students [37]. Well-resourced academic systems in the US offer more established research frameworks and support for mental health studies, exploring issues like burnout and depression during dental training [38,39].

In contrast, countries with fewer publications often face systemic barriers, limited research funding, cultural stigma around mental health, and lower institutional prioritization that suppresses inquiry into student well-being [40]. Overall, the presence of impactful research from over 60 countries highlights growing global awareness. Yet, the variation in frequency suggests disparities in research infrastructure, funding, or prioritization of student mental health in different parts of the world. However, citation counts can also be influenced by factors such as language of publication, accessibility, international collaboration, and the indexing of journals, meaning that less-cited regions are not necessarily less active, but perhaps less visible in global citation networks [41].

The strong preference for dental education–specific journals likely reflects how researchers are targeting audiences most responsive to curriculum development and pedagogical change. Publication in broader medical or interdisciplinary journals suggests overlapping concerns

such as public health, stress management, or behavioral integration that require attention from multiple domains.

The most cited studies in the field reflect a consistent focus on psychological distress, burnout, and academic stress across diverse educational settings. These influential works have shaped the way mental health is viewed in dental education, offering both empirical data and practical implications for institutional support systems. For instance, studies by Alzahem et al. 2011, [1] and Divaris et al. 2008, [26] identified that the heavy workload, clinical demands, and curriculum in dental schools might affect students' well-being and performance, and emphasized the need for a more supportive environment, curriculum reform to foster student well-being [1,26]. Confirming the findings, studies done by Basudan et al. 2017, [27] and Elani et al. 2014, [12] show that dental students often face high levels of depression, anxiety, and stress due to academic and clinical responsibilities, performance expectations, and time pressure. Due to these stressors, dental students experience higher stress than many non-medical students [28]. The scholarly attention these articles have received points to a broader recognition: that dental education is inherently demanding, and unless institutions actively prioritize mental health, student outcomes, both academic and personal, may suffer. These works continue to influence policy, pedagogy, and program development across dental schools worldwide. These findings indicate that dental education environments are stressful; yet the planning of effective responses and reliable support programs still requires greater attention.

The thematic evolution observed in the most cited studies on dental students' mental health reflects how research priorities have shifted during the last 25 years. From a focus on comparative studies exploring dental students' attitudes and insights into specific emotional or clinical stress markers during 1st decade of this millennium, the shift was noticed towards examining the academic environment and its relationship with psychological well-being, anxiety, and burnout in the next decade. The situation was further complicated by the pandemic era [42]. In 2021, the most influential publications included lifestyle-related mental health factors such as sleep disturbances. During the last 3 years, highly cited studies were focused on psychological stress, burnout, and measurable consequences like bruxism and diminished quality of life, with review articles synthesizing years of evidence into policy- and curriculum-relevant recommendations. This evolution marks a maturation of scholarly focus from mapping broad constructs to tackling specific stressors and their direct health outcomes within dental education.

The key findings of the study have been illustrated in Figure 7.

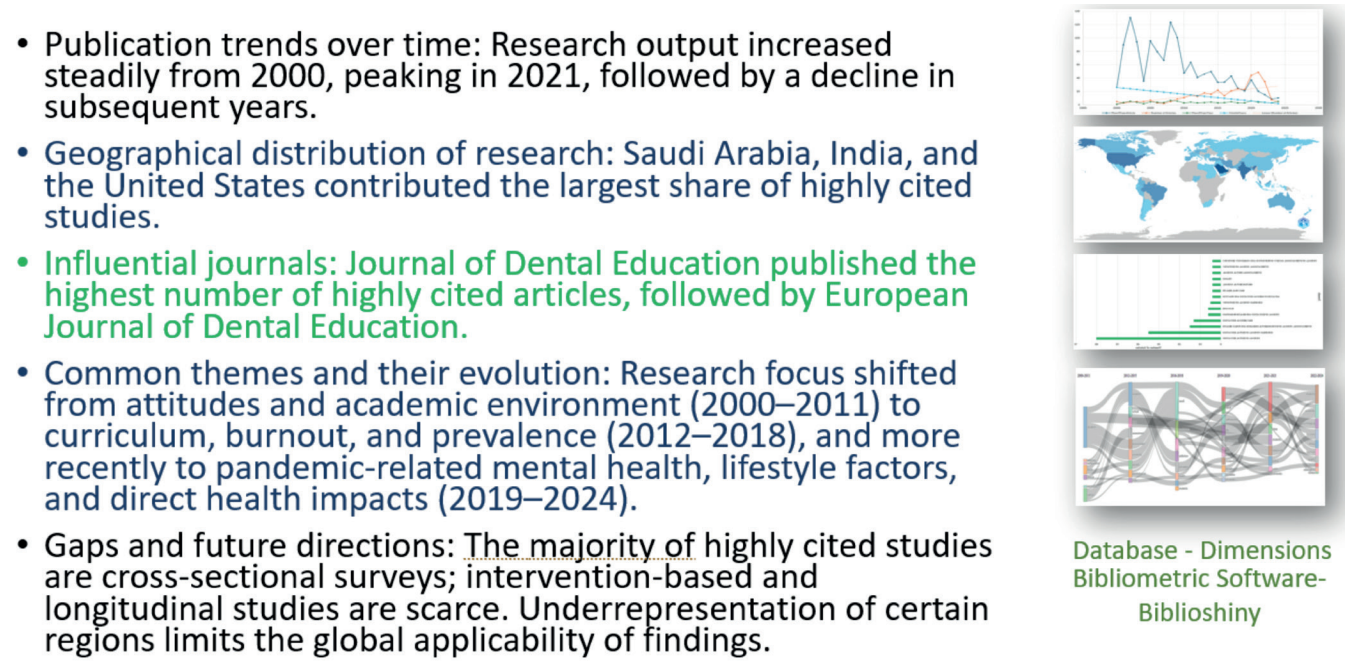

Figure 7: Key Findings of the Bibliometric Analysis of Most Cited Articles on Dental Students' Mental Health

Limitations

While this bibliometric analysis offers valuable insights into the global research landscape on the mental health of dental students, several limitations should be acknowledged. First, the study relied solely on the Dimensions database, which, although extensive, may not capture all relevant publications indexed exclusively in other databases such as Web of Science or Scopus. Second, the analysis focused only on the most cited articles, which, while highlighting influential works, may overlook emerging studies that have not yet had time to accumulate citations but could represent innovative or underexplored areas. Third, the reliance on citation counts as an indicator of influence carries inherent biases, as citation patterns can be shaped by factors such as language of publication, journal visibility, and regional collaboration networks, rather than solely by research quality. Finally, bibliometric methods provide quantitative patterns but cannot independently assess the methodological rigor or contextual relevance of the included studies. These limitations should be considered when interpreting the findings.

Future Recommendations

The findings of this study suggest that the influential studies in the domain are mostly survey-based. Therefore, future research should prioritize intervention-based studies that test evidence-driven strategies, such as resilience training, curriculum redesign, and structured faculty mentorship programs. The geographical distribution shows concentrated contributions from Saudi Arabia, India, and the United States, suggesting the need for conducting studies in underrepresented regions, where cultural and institutional contexts may shape unique stressors but remain underexplored. Additionally, given the recent rise in review articles synthesizing years of data, there is an opportunity to develop evidence-based standardized mental health monitoring frameworks for dental schools. Finally, the increased citation counts during pandemic-era research suggest that longitudinal follow-up studies are needed to understand whether the psychological effects observed during COVID-19 represent temporary spikes or persistent patterns that require systemic policy responses.

CONCLUSIONS

This bibliometric analysis on the mental health of dental students from 2000 to August 2025 shows a clear shift in research focus over time, from early work on attitudes and academic environment to more recent attention on burnout, psychological stress, and measurable health outcomes such as bruxism and reduced quality of life. Publication trends reveal peaks around 2021, influenced in part by the COVID-19 pandemic, followed by a decline that may indicate a shift toward more specialized subtopics. The Journal of Dental Education has been identified as the most frequently published journal in the domain. Geographical patterns highlight strong contributions from Saudi Arabia, India, and the United States. Most of the studies among the most cited work are survey-based studies, suggesting a need for more intervention-focused research that can guide practical changes in dental education. Overall, this study provides a comprehensive overview of 25 years of highly cited research, suggesting direction for future studies and policy efforts aimed at improving the mental well-being of dental students.

Consent for Publication

The author has reviewed and approved the final version and agrees to be accountable for all aspects of the work, including any accuracy or integrity issues.

DISCLOSURE

Mainul Haque works as an editorial team member of the Bangladesh Journal of Medical Science, Bangladesh. The remaining authors declare that they do not have any financial involvement or affiliations with any organization, association, or entity directly or indirectly related to the subject matter or materials presented in this review paper.

Data Availability

Information for this review paper is taken from freely available sources.

Authorship Contribution

All authors contributed significantly to the work, whether in the conception, design, utilization, collection, analysis, or interpretation of data, or all these areas. They also participated in the paper's drafting, revision, or critical review, gave their final approval for the version that would be published, decided on the journal to which the article would be submitted, and made the responsible decision to be held accountable for all aspects of the work.

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