MEDICAL RECORDS-International Medical Journal

Research Article

Bibliometric Analysis of Published Articles on Bruxism

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Abstract

Aim: This study aims to perform a bibliometric analysis of bruxism-related research published between 2005 and 2024. By evaluating publication trends, citation impact, key contributors, and keyword networks, the study seeks to provide insights into the intellectual structure of the field and highlight emerging research directions.

Material and Method: Data for this bibliometric analysis were extracted from the Web of Science database. The inclusion criteria consisted of original research articles published in English between 2005 and January 2025. The search term 'bruxism' was used to identify relevant publications. VOSviewer software was employed for network mapping to examine collaborations among authors, institutions, and countries. Citation metrics, keyword frequency, and journal distribution were analyzed to assess the academic impact of bruxism research.

Results: A total of 2,874 relevant articles were identified, demonstrating a significant increase in bruxism-related research over the last two decades. The United States, Brazil, and Japan emerged as leading contributors. Frank Lobbezoo was identified as the most prolific author, while the Journal of Oral Rehabilitation published the highest number of articles. Keyword analysis revealed that 'bruxism, 'sleep bruxism,' and 'temporomandibular disorders,' were the most frequently studied topics.

Conclusion: The growing volume of bruxism research highlights its significance across multiple disciplines, including dentistry, neurology, and sleep medicine. Future studies should focus on standardizing diagnostic criteria, exploring genetic predispositions, and leveraging technological innovations for improved clinical outcomes.

Keywords: Bruxism, bibliometric analysis, Web of Science

INTRODUCTION

Bruxism is a parafunctional activity characterized by the involuntary grinding or clenching of teeth, occurring either during wakefulness or sleep (1). This condition has been extensively studied due to its complex etiology, which involves physiological, psychological, and neurological components. Bruxism is not only a condition that leads to dental wear but also a complex disorder associated with neurological and psychological factors. Its interdisciplinary nature requires a comprehensive approach involving dentistry, neurology, and sleep medicine. (2). It has been recognized as a contributing factor to dental wear, headaches, orofacial pain, and sleep disturbances, ultimately impacting the quality of life of affected individuals (3).

Over the last two decades, there has been a substantial increase in research focusing on bruxism, driven by advancements in diagnostic methodologies, such as polysomnography and electromyography, and an improved understanding of its underlying mechanisms (4). The use of bibliometric analysis in this field has become crucial for mapping the academic landscape, assessing publication trends, citation metrics, influential authors, and inter-institutional collaborations. Such analyses provide valuable insights into the evolution of bruxism research, identifying emerging topics and key contributors in the field.

This study aims to conduct a thorough bibliometric analysis of research articles related to bruxism published between 2005 and 2024. It seeks to assess various bibliometric indicators, including annual publication trends, citation impact, leading researchers and institutions, and the distribution of research across different journals. Additionally, keyword analysis will be conducted to highlight dominant research themes and identify shifts in scientific focus over time. The ultimate goal of this study is to elucidate the intellectual structure of bruxism research, aiding future researchers in identifying knowledge gaps and potential directions for further investigation.

CITATION

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MATERIAL AND METHOD

Study Design

In this bibliometric analysis study, the methodological flow of studies with similar research designs were followed (5). The data were obtained from the Web of Science (WoS) (Thomson Reuters, Philadelphia, PA, USA) database by TB on January 25, 2025. As the data were obtained from a single database, duplication was inherently avoided.

WoS is a leading citation database and contains records of articles from the highest impact journals worldwide. It has ten indexes containing information gathered from thousands of scholarly journals, books, book series, and conferences. Science Citation Index-Expanded (SCI-E) is a large database of approximately ten thousand journals with high-impact citations. It is the latest journal citation system and database offered by the WoS, covering many fields, including arts, humanities, and social sciences (6). The H-index was introduced by Jorge Hirsch from the University of California in the USA in 2005. It is one of the bibliometric data in the scientific world. While the number of publications a researcher has made and the citations made to these publications are important, Hirsch's invention created a balance between the number of publications produced and the number of citations received. For example, if an author has 10 articles and 6 of these 10 articles have received six or more citations, the H-index value for that researcher is accepted as 6 (7).

The inclusion criteria were determined as follows: (I) English language articles, (II) published between January 2005 and January 2025, (III) original articles category according to WoS indexing. The search term 'bruxism' was typed into the search bar in the WoS database. Data on the determined articles were obtained using the 'create citation report' and 'analyse results', exported in tab-delimited file format, and transferred to VOSviewer, a freely-available software for bibliometric analysis (www.vosviewer.com) (8). Web mapping was performed to identify the links and density between the characteristics of articles including authors, institutions, countries, scientific categories, keywords, journals, and publication years. On the network map, a larger sized ring and a thicker line between the nodes represent a greater network and strength of links between the queried items.

Since the data used in this study is completely public, it does not require ethics committee approval. Clinical trial number: not applicable.

RESULTS

The search for the term 'bruxism' resulted in 4,091 documents in the all fields category at all times. The title of 1,302 documents, the abstract of 2,210 documents, and the keywords of 1,887 documents contained the term 'bruxism'. Excluding the abstracts, letters, editorials, book chapters, and amendments there were 3,525 documents containing the term 'bruxism'. After excluding non-original, early access articles and not in English 2,874 articles remained.

While the number of articles containing the term 'bruxism' was 44 in 2005, this number increased to 221 in 2024. There has been a significant increase in articles about bruxism over the years. 2022 appears to be the year with the most articles about bruxism. Figure 1 reveals the trend in articles containing the term 'bruxism' over the last 20 years.

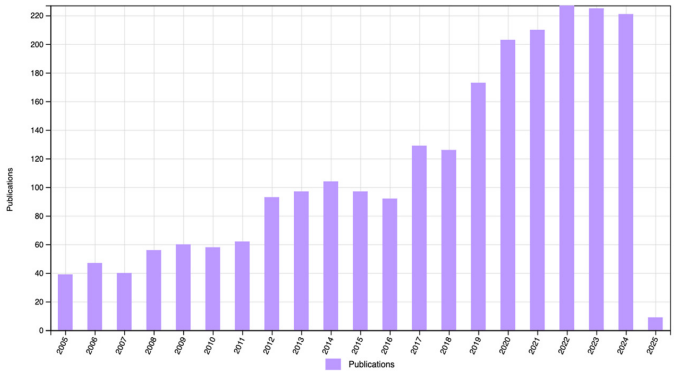

Figure 1. Articles containing the term 'bruxism' between 2005 and 2025

While the number of citations to articles containing the term 'bruxism' was 742 in 2005, this number increased to 7,402 in 2024 (Figure 2).

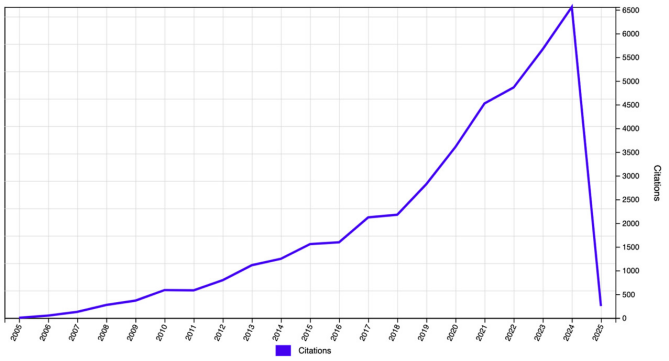

Figure 2. Citations of articles containing the term 'bruxism' between 2005 and 2025

The country with the most articles containing the term 'bruxism' was the United States of America with 444 articles. It was followed by Brazil with 372 articles and the Japan with 288 articles (Figure 3).

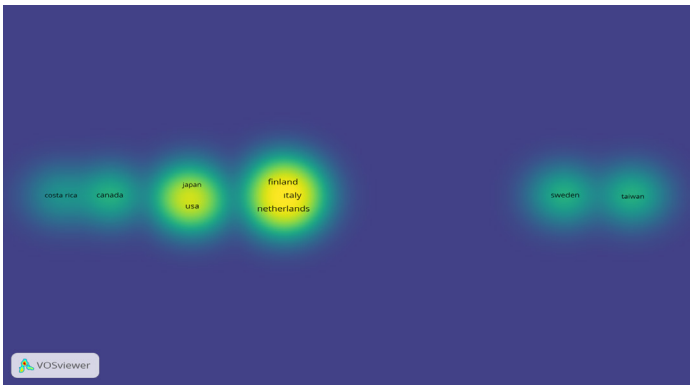

Figure 3. Country density mapping

The author with the most articles about bruxism in total was Frank Lobbezoo with 115 articles. Daniel Manfredini is in second place with 93 articles and Gilles J. Lavigne is in third place with 72 articles (Figure 4).

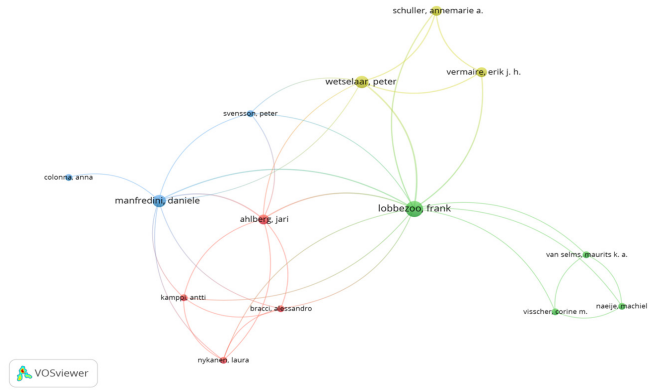

Figure 4. Author network mapping

The institutions with the most articles about bruxism were the Academic Center for Dentistry Amsterdam, and Vrije Universiteit Amsterdam with 142 publications, followed by University of Amsterdam with 115 articles (Figure 5).

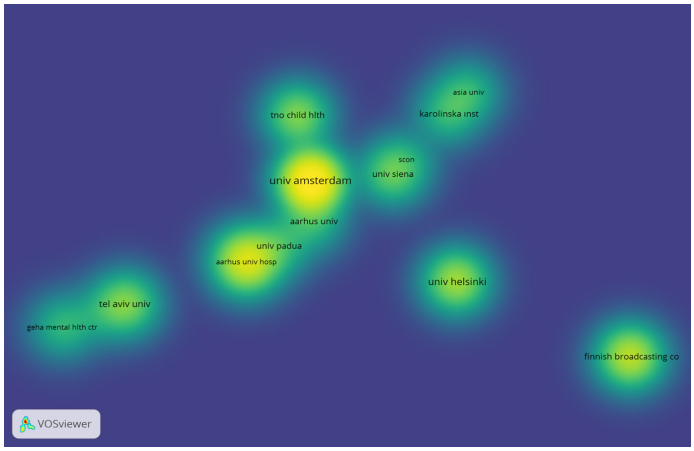

Figure 5. Institution network mapping

When the keywords of the articles about bruxism were examined, it was seen that the most frequently used keywords were 'bruxism', 'sleep bruxism', and 'temporomandibular disorders'. Keyword network mapping is demonstrated in Figure 6.

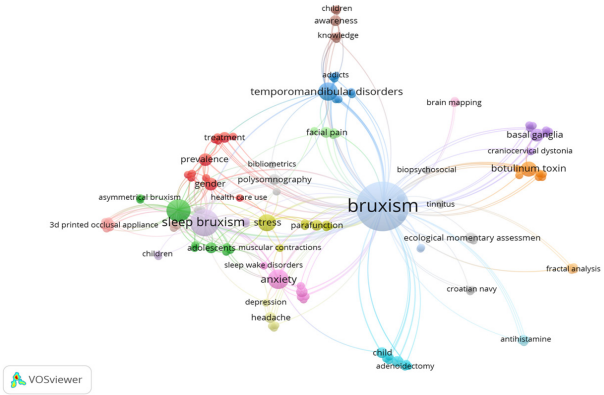

Figure 6. Keyword network mapping

The most cited articles on bruxism are shown in Table 1. The first two articles appear to have been written by Frank Lobbezoo, the author with the most articles on bruxism, and were published in the Journal of Oral Rehabilitation.

Of the 2874 articles published on bruxism, 1566 were published in the field of dentistry oral surgery medicine, 352 in the field of neurosciences neurology, and 230 in the field of general internal medicine (Figure 7).

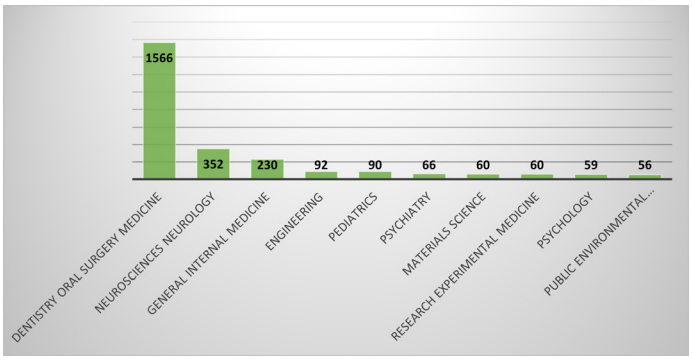

Figure 7. Top 10 categories containing the term 'bruxism'

The 10 journals that published the most articles on bruxism are shown in Table 2. Journal of Oral Rehabilitation ranks first with 260 articles.

Table 1. The 10 most cited articles containing the term 'bruxism'

Article	First author	Journal name	Year	Total citation
Bruxism Defined and Graded: An International Consensus (9)	Frank Lobbezoo	Journal of Oral Rehabilitation	2013	773
International Consensus on the Assessment of Bruxism: Report of a Work in Progress (10)	Frank Lobbezoo	Journal of Oral Rehabilitation	2018	728
Longevity of Posterior Composite Restorations: Not Only a Matter of Materials (11)	Flavio Demarco	Dental Materials	2012	677
Epidemiology of Restless Legs Symptoms in Adults (12)	Phillips, Brian	Archives of Internal Medicine	2000	552
Sleep Bruxism: Validity of Clinical Research Diagnostic Criteria in a Controlled Polysomnographic Study (13)	Gilles J. Lavigne	Journal of Dental Research	1996	522
Restless Legs Syndrome and Sleep Bruxism - Prevalence and Association Among Canadians (14)	Gilles J. Lavigne	Sleep	1994	512
Risk Factors for Sleep Bruxism in the General Population (15)	Maurice M Ohayon	Chest	2001	339
Biological and Technical Complications and Failures With Fixed Partial Dentures (FPD) on Implants and Teeth After Four to Five Years of Function (16)	Urs Bragger	Clinical Oral Implants Research	2001	321
Development of Parasomnias From Childhood to Early Adolescence (17)	Luc Laberge	Pediatrics	2000	243
Quantitative Study of Bite Force During Sleep Associated Bruxism (18)	Kesikue Nishigawa	Journal of Oral Rehabilitation	2001	232

Table 2. The 10 journals that published the most articles about bruxism		
Journal name	**Article number**	**Percentage**
Journal of Oral Rehabilitation	260	9.05
Cranio The Journal of Craniomandibular Sleep Practice	139	4.84
Journal of Prosthetic Dentistry	67	2.33
Journal of Clinical Medicine	65	2.62
Clınıcal Oral Investigations	55	1.91
International Journal of Prosthodontics	53	1.84
Acta Odontologica Scandinavica	46	1.60
Bmc Oral Health	42	1.46
Journal of Orofacial Pain	41	1.43
Sleep and Breathing	39	1.36

DISCUSSION

The findings of this bibliometric analysis reveal a growing academic interest in bruxism, demonstrated by a consistent increase in publications over the past two decades. The upward trend in research output, particularly noticeable after 2010, can be attributed to an enhanced awareness of bruxism's impact on oral health and general well-being, as well as improvements in diagnostic and assessment techniques. The increasing volume of research underscores the importance of bruxism as a multidisciplinary issue that spans dental, medical, and psychological fields.

A detailed examination of the most cited publications indicates that international consensus reports on bruxism classification and assessment have significantly influenced the field (9-11). Notably, researchers such as Frank Lobbezoo (9,10) and Gilles J. Lavigne (13,14) have made substantial contributions, with their work receiving widespread recognition. These studies emphasize the necessity for standardized diagnostic criteria and evidence-based methodologies to ensure the reliability and reproducibility of bruxism-related research. The prevalence of systematic reviews and meta-analyses among the most cited articles further highlights the need for rigorous, well-designed studies to guide clinical practice and policymaking.

Geographical analysis suggests that the United States, Brazil, Japan, and several European nations are at the forefront of bruxism research, contributing the highest number of publications. This trend aligns with the presence of well-established research institutions and funding support in these regions. Institutional collaborations have played a pivotal role in advancing the field, with multidisciplinary teams from various specialties—ranging from dental sciences to neurology—driving innovation and expanding our understanding of bruxism.

Keyword network analysis reveals several recurring themes in bruxism research, including "sleep bruxism," "stress," "temporomandibular disorders," "muscle activity," and "polysomnography." These keywords reflect the evolving nature of bruxism studies, with increasing emphasis on its relationship with sleep disorders, neurophysiological mechanisms, and psychological factors (19). Furthermore, the association between bruxism and comorbid conditions such as obstructive sleep apnea and anxiety disorders has gained significant attention in recent years (20).

Recent studies have also explored the impact of technological advancements in diagnosing and managing bruxism (21,22). Wearable devices and smartphone applications equipped with electromyographic sensors have been introduced as potential tools for real-time monitoring and assessment. These innovations could enhance the accuracy of bruxism diagnosis and facilitate early interventions, reducing the risk of long-term complications.

Moreover, the role of genetic predisposition in bruxism is an emerging research avenue. Preliminary studies have suggested a potential hereditary component, indicating that genetic markers may play a role in an individual's susceptibility to developing bruxism (23). Further exploration in this area could lead to personalized treatment strategies and improved preventive measures tailored to individuals with a higher genetic risk.

Despite significant advancements, several challenges remain in bruxism research. One major limitation is the heterogeneity in diagnostic criteria across different studies, leading to inconsistencies in reported prevalence rates and treatment outcomes. A unified framework for diagnosis and classification is necessary to improve the comparability of findings and ensure more reliable conclusions (21). Additionally, most studies rely on self-reported data or clinical examinations, which may not always provide accurate representations of bruxism severity (24). The integration of objective, technology-driven assessment tools into routine clinical practice could enhance diagnostic accuracy.

Another critical aspect that requires further investigation is the long-term impact of bruxism on oral and systemic health. While the role of bruxism in dental wear,

temporomandibular disorders, and orofacial pain is well documented (25,26), its potential implications for systemic conditions such as cardiovascular diseases and metabolic disorders remain unclear. Given the known associations between sleep disorders and systemic health (27), future studies should explore whether chronic bruxism contributes to broader physiological dysfunctions.

Although VOSviewer is an effective tool for network visualization, it has certain limitations, such as its reliance on co-occurrence data, which may overlook nuanced relationships between publications.

Future research directions should focus on interdisciplinary collaboration to develop a more holistic understanding of bruxism. Integrating findings from neuroscience, behavioral sciences, and biomechanics could yield a comprehensive approach to diagnosis and treatment. Additionally, longitudinal studies with large sample sizes are essential to validate existing findings and establish standardized treatment protocols.

CONCLUSION

In conclusion, this bibliometric analysis provides a comprehensive overview of the academic landscape surrounding bruxism research. It highlights key contributors, emerging trends, and critical areas that require further exploration. As the field continues to advance, interdisciplinary collaborations and technological innovations will be instrumental in shaping future research directions. Addressing existing knowledge gaps and refining diagnostic and therapeutic methodologies will ultimately lead to better clinical outcomes and an improved quality of life for individuals affected by bruxism. Future studies should focus on large-scale cohort investigations exploring the genetic predisposition to bruxism, which could pave the way for personalized treatment strategies.

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Ethical approval: *Since the data used in this study is completely public, it does not require ethics committee approval.*

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