

Revitalizing Sports Dentistry: Insights from Bibliometric Analysis

Vrinda Saxena*, Asmita Datla, Ankita Bargav, Manish Deheriya, S. Saina, Nandani Tiwari

Department of Public Health Dentistry, Government College of Dentistry, Indore, Madhya Pradesh, India.

Abstract

Introduction: “Bibliometric examination sheds light on the realm of sports dentistry, fortifying athletes’ dental well-being and optimizing performance through evidence-based analysis and targeted measures.” Sports dentistry provides a comprehensive overview of the field of sports dentistry, highlighting the significance of preventing and managing dental injuries in athletes. It emphasizes the necessity for collaboration among various stakeholders, including athletes, coaches, parents, and dental professionals. the prevalence of dental trauma in sports, particularly in contact sports, and the emergence of sports dentistry in the 1980s to address this issue. **Material and Methods:** Sports dentistry introduces the bibliometric analysis conducted using the R programming language and R Studio software, aiming to examine existing literature and research trends in sports dentistry. The search strategy involved querying the PubMed Core Collection from 2000 to 2024, focusing on articles related to Keywords – “mouth protectors,” “athletic injuries,” and “preventive measures.” The analysis encompasses various aspects, including publication trends, author collaboration, journal impact, keyword analysis, and international collaboration patterns. **Results:** It identifies key findings such as a decline in publication output, limited international collaboration, and low citation impact, suggesting areas for improvement and strategic interventions. **Conclusion:** It concludes by highlighting the importance of understanding the factors driving the decline in publication output and the need for revitalizing research efforts in sports dentistry. **Recommendation:** It recommends strategies to encourage international collaboration, disseminate research findings, and invest in addressing critical knowledge gaps. Overall, the Summary underscores the significance of sports dentistry in safeguarding athletes’ oral health and suggests avenues for advancing research and innovation in the field.

Keywords: Bibliometrics, Mouthguard, Oral trauma, Research trends, Sports dentistry.

INTRODUCTION

Sports dentistry involves the prevention and treatment of oral cavity and stomatognathic system issues associated with sports activities. The stomatognathic system encompasses the teeth, jaws, soft tissues, facial muscles, and the temporomandibular joint.^[1]

The field of sports dentistry has garnered increased recognition and significance owing to the prevalence of dental injuries in sports, especially in contact sports and among athletes engaging in physical activities from an early age.^[2,3] The imperative for dental professionals to prevent and manage such injuries has become paramount, necessitating collaboration among athletes, coaches, parents, and the dental community.^[4,5]

Dental trauma, encompassing injuries to both soft and hard tissues of the orofacial region, poses significant risks during sports participation.^[5,6] The emergence of sports dentistry in the 1980s shed light on the vulnerability of teeth and facial bones

in contact sports, stressing the need for swift intervention and injury management.^[6]

As individuals of all age groups partake in sports for various reasons including enjoyment, competition, and fitness, the risk of dental injuries remains a persistent concern.^[7] Studies consistently highlight a notable incidence of dental injuries among athletes, with certain sports presenting greater risks than others.^[8,9] Despite the implementation of preventive measures such as mouthguards, their voluntary usage in many sports perpetuates challenges in injury prevention.^[10,11]

During London Olympian games oral health performance-related impact is enumerated, 40% of elite athletes were

Address for correspondence: Dr. Vrinda Saxena,
Department of Public Health Dentistry, Government College of
Dentistry, Indore, Madhya Pradesh, India.
Email: dr.vrinda@gmail.com

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bothered about their oral health, 28% reported impact on quality of life, and 18% reported an impact on training and performance. Hence, oral and dental traumatic injuries can happen frequently when practicing contact and combat sports. Thus, a proper law for protection is needed.^[1]

The Sports Mouthguard Market reached a value of USD 3.89 billion in 2022 and is projected to achieve USD 5.55 billion by 2029, with a compound annual growth rate of 5.2% during the forecast period from 2023 to 2029.^[12]

In the United Kingdom, while dental bodies lack specific guidelines mandating mouthguard use across all sports, some sports leagues and organizations enforce their usage in specific contexts such as rugby, lacrosse, boxing, and field hockey.^[13,14] However, voluntary mouthguard use persists in most sports, leaving athletes vulnerable to dental injuries.^[13,15]

This paper aims to conduct a bibliometric analysis of sports dentistry employing the R programming language^[16] and R Studio software.^[17] Through an examination of existing literature and research trends in sports dentistry, this analysis seeks to augment professional awareness and interest in the field, thereby contributing to enhanced injury prevention and management strategies in sports.

Moreover, through bibliometric analysis,^[18] this study will offer insights into the current research landscape, key topics, prolific authors, and emerging trends within sports dentistry. By leveraging bibliometric techniques, we endeavor to

provide a comprehensive overview of the scholarly terrain, pinpointing areas for further exploration and fostering potential collaboration among researchers and practitioners in sports dentistry.

MATERIALS AND METHODS

Search strategy

We searched the PubMed Core Collection using the following items: TS = (“[MeSH “Mouth Protector” OR “Mouth Guards” OR “Mouthguard” OR “Dental Splints”] AND [MeSH “Adolescent” OR “Teenagers” OR “Youth”] AND [MeSH “Adult” OR “Adults”] AND [MeSH “Athletic Injuries/prevention and control” OR “Sports Injuries/prevention and control” OR “Injury Prevention” OR “Injury Reduction”]”) from 2000 to 2024. The language was restricted to English and document types were restricted to original or research articles and review articles (Figure 1). Access was gained to PubMed for the retrieval process. To mitigate any alterations in citation details caused by the frequent updates in publications, two researchers independently conducted the retrieval process on the same day in January 2024. Any discrepancies that arose were settled through discussions with a senior dentist until a mutual agreement was reached.

Data extraction and analysis

The bibliometric analysis involved extracting details such as the title, author, institution, country, publication year,

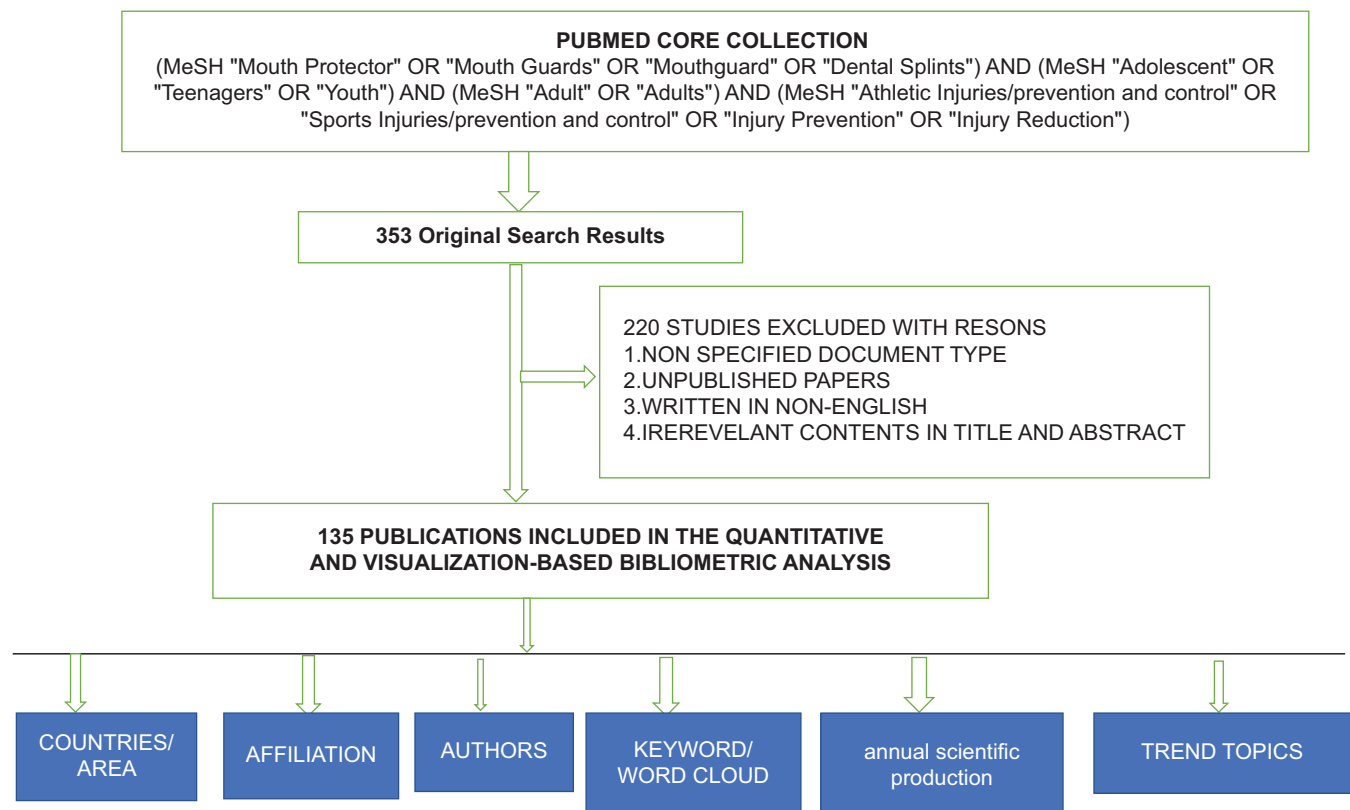


Figure 1: Flow chart as per prisma ScR

keywords, and citations, which were then imported into Microsoft Excel 2010 (Redmond, Washington, USA). Citexs AI (Wuhan, China) was utilized to recognize associated diseases. Using R programming and R Studio software,^[19] countries, institutions, authors, journals, diseases, and keywords were visualized. In the visualization, node size and the thickness of lines between nodes in R studio^[20] reflect the quantity of publications generated and the intensity of connections.

Data analysis

Descriptive analysis

Analyze publication trends over time, including the distribution of publications by year and document types.

Author analysis

Identify prolific authors and collaboration networks within the field. Analyze author productivity and co-authorship patterns.

Journal analysis

Evaluate the impact and influence of journals publishing research in sports dentistry. Assess journal metrics such as impact factor and citation count.

Keyword analysis

Identify recurring keywords and topics within the literature. Analyze keyword frequency, co-occurrence networks, and thematic clusters.

Visualization and interpretation

- Utilize bibliometric visualization techniques such as co-authorship networks, keyword co-occurrence maps, and citation networks to visualize relationships and patterns within the data.
- Interpret findings: Interpret the results of the bibliometric analysis^[21] in relation to the defined research objectives. Identify key trends, influential authors, hot topics, and gaps in the literature.

RESULTS

Based on the provided data on bibliometric analysis of sports dentistry, here is an analysis: (Table 1 and Figure 2).

Publication trends

- The data span from 2000 to 2023, covering 56 different sources and 135 documents
- However, there is a concerning negative annual growth rate of -7.14%, indicating a decline in publication output over the specified timespan
- The average age of the documents is 15 years, which suggests that the bulk of the publications are not recent.

Document characteristics

- The average number of citations per document is 0, indicating that the publications may not have received significant attention or recognition within the academic community

Table 1: Data retrieval on sport dentistry

Timespan	2000:2023
Sources (Journals, Books, etc)	56
Documents	135
Annual Growth Rate %	-7.14
Document Average Age	15
Average citations per doc	0
References	1
Document contents	
Keywords Plus (ID)	511
Author's Keywords (DE)	511
Authors	
Authors	433
Authors of single-authored docs	17
Authors collaboration	
Single-authored docs	24
Co-Authors per Doc	3.67
International co-authorships %	4.444
Document types	
Case reports	1
Case reports;journal article	1
Clinical trial;controlled clinical trial;journal article;research support, non-u.s. gov't	1
Clinical trial;journal article;randomized controlled trial;research support, non-u.s. gov't	1
Comment;letter	2
Comparative study;evaluation study;journal article	1
Comparative study;journal article	8
Comparative study;journal article;observational study;randomized controlled trial	1
Comparative study;journal article;randomized controlled trial	1
Comparative study;journal article;research support, non-u.s. gov't	2
Editorial guideline	2
Journal article	1
Historical article;journal article	3
Journal article 80 journal article;meta-analysis; systematic review	1
Journal article;personal narrative;research support, non-u.s. gov't	1
Journal article;randomized controlled trial	3
Journal article;randomized controlled trial;research support, non-u.s. gov't	1
Journal article;research support, n.i.h., extramural	2
Journal article;research support, non-u.s. gov't	8
Journal article;research support, non-u.s. gov't;research support, u.s. gov't, p.h.s.	2
Journal article;review	9
Journal article;validation study	1
Letter	1
News	1

- There is only 1 reference, which might indicate a limited scope or focus of the publications.

Authors and collaboration

- There are 433 authors contributing to the 135 documents, indicating a diverse group of researchers involved in sports dentistry

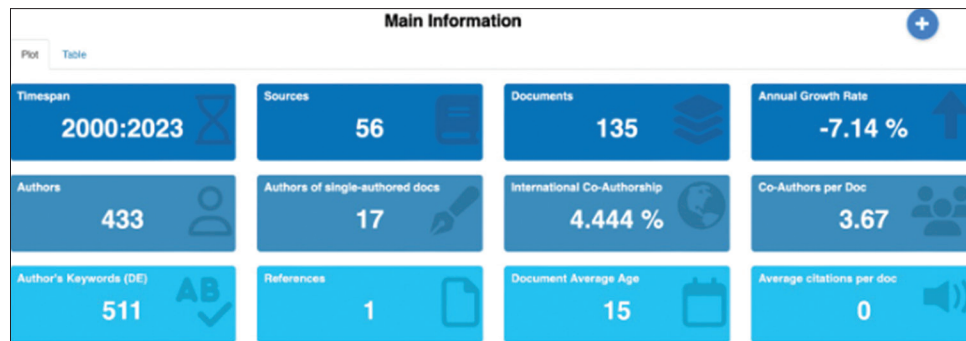


Figure 2: Publication analysis data retrieval on sport dentistry

- However, only 17 out of 135 documents were authored by a single individual, suggesting a prevalent trend of collaboration in the field
- The average number of co-authors per document is 3.67, indicating a considerable level of collaboration among researchers.

Document types

- Journal articles dominate the document types, with 80 out of 135 documents being categorized as such
- Other document types include comparative studies, clinical trials, case reports, historical articles, editorials, reviews, and letters, reflecting the diverse nature of research within sports dentistry.

Keywords and content

- The presence of 511 keywords plus (ID) and author's keywords (DE) indicates a wide array of topics and research interests covered in the publications.

Collaboration patterns

Despite the high number of authors, international co-authorships are relatively low at 4.444%, suggesting limited global collaboration in sports dentistry research.

Document impact

The low average number of citations per document suggests that the publications may not have had a significant impact or influence on the academic community.

Document funding

Some documents received research support, primarily from non-U.S. government sources.

In summary, while the data provide insights into publication trends, collaboration patterns, and document types within sports dentistry, the negative growth rate and low citation impact may indicate challenges or shifts within the research landscape during the specified period. Further analysis and investigation are necessary to understand the underlying factors driving these trends and their implications for the field. In Table 2, the analysis of publication distribution among journals related to sports dentistry reveals a diverse landscape with several key contributors:

- Dental traumatology: Official Publication of International Association for Dental Traumatology emerges as the most

prolific source, reflecting its focus on dental trauma and its relevance to sports-related injuries.

- Journals such as General Dentistry, the British Journal of Sports Medicine, and the European Journal of Paediatric Dentistry contribute significantly to the literature, highlighting the interdisciplinary nature of sports dentistry.
- Other journals such as the Clinical Journal of Sport Medicine, Dental Clinics of North America, and Injury Prevention: Journal of the International Society for Child and Adolescent Injury Prevention cater to specific aspects of sports dentistry, offering insights into preventive measures, treatment modalities, and injury prevention strategies.
- While some journals, such as the AANA Journal and Current Sports Medicine Reports, offer niche perspectives on dental considerations in sports medicine and anesthesia, others such as Dentistry Today and the International Dental Journal provide platforms for discussing advancements and best practices in dental care for athletes.

Overall, the distribution of publications across these journals underscores the multidisciplinary nature of sports dentistry, encompassing various facets of dental care, sports medicine, injury prevention, and pediatric dentistry. These journals play a crucial role in disseminating knowledge, fostering collaboration, and advancing research within the field of sports dentistry.

Graph 1 shows a line graph of annual scientific production. The X-axis shows the year, and the Y-axis shows the number of articles produced. The title of graph is "Annual Scientific Production."

The data points on graph show that there has been a general increase in scientific production over the past 20 years. The number of articles produced in 2020 was more than double the number of articles produced in 2000. There are also some fluctuations in the data, such as the dip in 2008 and the peak in 2018.

It is important to note that this graph only shows the number of articles produced. It does not take into account the quality of the articles or the impact of the research. It is also possible

Table 2: Scientometrics of the journals published with sports dentistry

Dental traumatology : official publication of international association for dental traumatology	46
General dentistry	6
British journal of sports medicine	5
European journal of paediatric dentistry	5
Clinical journal of sport medicine : official journal of the canadian academy of sport medicine	3
Dental clinics of north america	3
Aana journal	2
Current sports medicine reports	2
Dentistry today	2
Injury prevention : Journal of the international society for child and adolescent injury prevention	2
International dental journal	2
Journal of athletic training	2
Journal of oral science	2
Journal of science and medicine in sport	2
Journal of the american dental association (1939)	2
Journal of the history of dentistry	2
Journal of the irish dental association	2
Medicine and science in sports and exercise	2
Nederlands tijdschrift voor tandheelkunde	2
Odonto-stomatologie tropicale = tropical dental journal	2
Pediatric dentistry	2
Primary dental care : Journal of the faculty of general dental practitioners (uk)	2
The journal of the michigan dental association	2
Anaesthesia	1
Asdc journal of dentistry for children	1
Australian and new zealand journal of public health	1
Australian dental journal	1
Compendium of continuing education in dentistry (jamesburg, n.J. : 1995)	1
Cranio : the journal of craniomandibular practice	1
Dental materials : Official publication of the academy of dental materials	1
European journal of applied physiology	1
Hawaii dental journal	1
International journal of paediatric dentistry	1
International journal of sports medicine	1
Journal (canadian dental association)	1
Journal of applied oral science: Revista fob	1
Journal of orthodontics	1
Journal of public health dentistry	1
Journal of special operations medicine:	1
A peer reviewed journal for sof medical professionals	1
Journal of stomatology, oral and maxillofacial surgery	1
Journal of the california dental association	1
Journal of the national medical association	1

that the increase in scientific production is due to factors such as the increasing number of scientists in the world, rather than an improvement in the quality of research.

Overall, the image shows that there has been a general increase in scientific production over the past 20 years.

Possible reasons for increased scientific production

Growing global research workforce

- More scientists entering the field naturally lead to more research output.

Increased funding for research

- Governments and private industries investing more in scientific endeavors lead to more resources and opportunities for research.

Advancements in research tools and methods

- New technologies and data analysis techniques allow for faster and more efficient research, leading to more publications.

Globalization of research collaboration

- Increased international collaborations allow for pooling resources, expertise, and data, boosting research productivity.

Pressure to publish for career advancement

- In academic and research institutions, pressure to publish can act as a motivator for increased output, though not necessarily quality.

Measuring quality of research

Quality is a subjective concept in research, but some potential indicators include

Citations

- Highly cited research is often considered impactful and influential.

Replication and reproducibility

- Studies that can be reliably replicated are considered more robust and valid.

Methodological rigor

- The strength of research design, data collection, and analysis processes are important indicators of quality.

Real-world application

- Research with practical applications and solutions to real-world problems can be seen as valuable and impactful.

Implications of increased scientific production

Advancement of knowledge and technological progress

- Continued research leads to new discoveries, innovations, and solutions to challenges in various fields.

Improved healthcare and medicine

- Scientific breakthroughs can lead to better treatments, diagnostics, and understanding of diseases.

Economic growth and development

- Technological advancements and knowledge-based economies benefit from strong research infrastructures.

Ethical and social considerations

- Increased scientific power must be accompanied by responsible use, addressing concerns such as bioethics,

data privacy, and potential misuse of technological advancements.

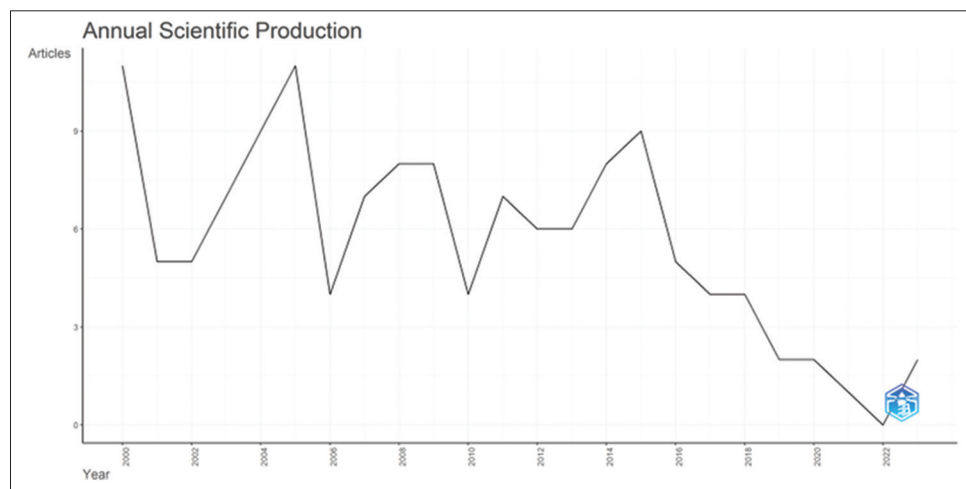
It is important to remember that these are just some potential answers, and the true reasons and implications behind the increase in scientific production are complex and multifaceted. Further, investigation and analysis of specific disciplines, research trends, and quality metrics would be crucial for a more nuanced understanding of this phenomenon.

- Graph 2 titled “Most Relevant Authors” and the X-axis shows the author’s name, with each author being assigned a letter code. The Y-axis shows the number of documents authored by each author. Moreover, it displays the top ten authors based on the number of documents authored. Filippia, Na, and Krastl G emerge as the most prolific contributors. The analysis underscores their significant output within the field. However, it is important to note that graph solely focuses on publication count and does not assess the quality or impact of the research. Further exploration into the authors’ research interests, affiliations, and citation metrics would provide a

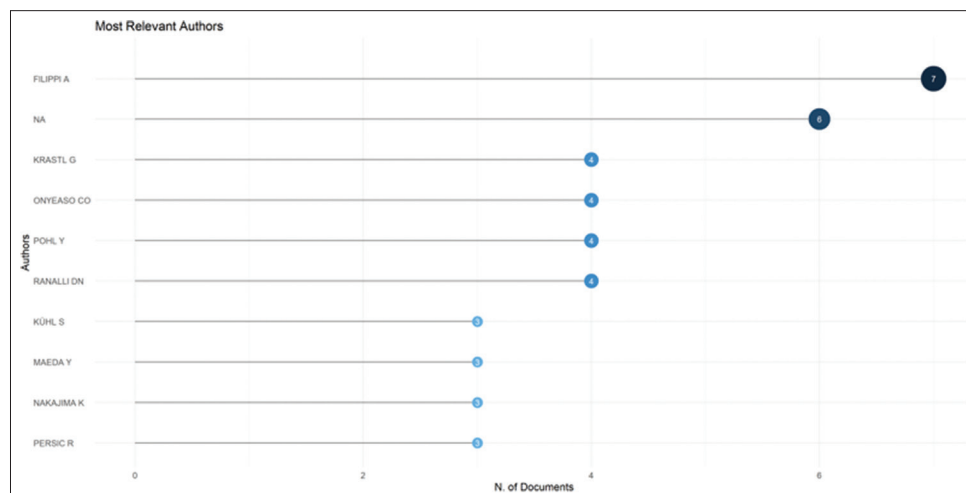
more comprehensive understanding of their contributions. In summary, while graph offers insights into prolific authors, a deeper examination is necessary to gauge their influence and significance within the field of study.

Graph 3 shows the author’s production over time:

- Overall, the author’s publication output has increased steadily over time. The line graph shows a generally upward trend from 0 publications in 2010 to 7 publications in 2018. This suggests that the author is becoming more productive in their research.
- There have been some fluctuations in the author’s publication output. The line graph is not perfectly smooth, and there are some years where the author published fewer papers than others. This is normal, and it is likely due to a variety of factors, such as the author’s workload, funding, and personal life.
- The author’s most productive years were 2016 and 2018, when they published 3 publications each. This suggests that the author was particularly focused on their research during these years.



Graph 1: Shows a line graph of annual scientific production



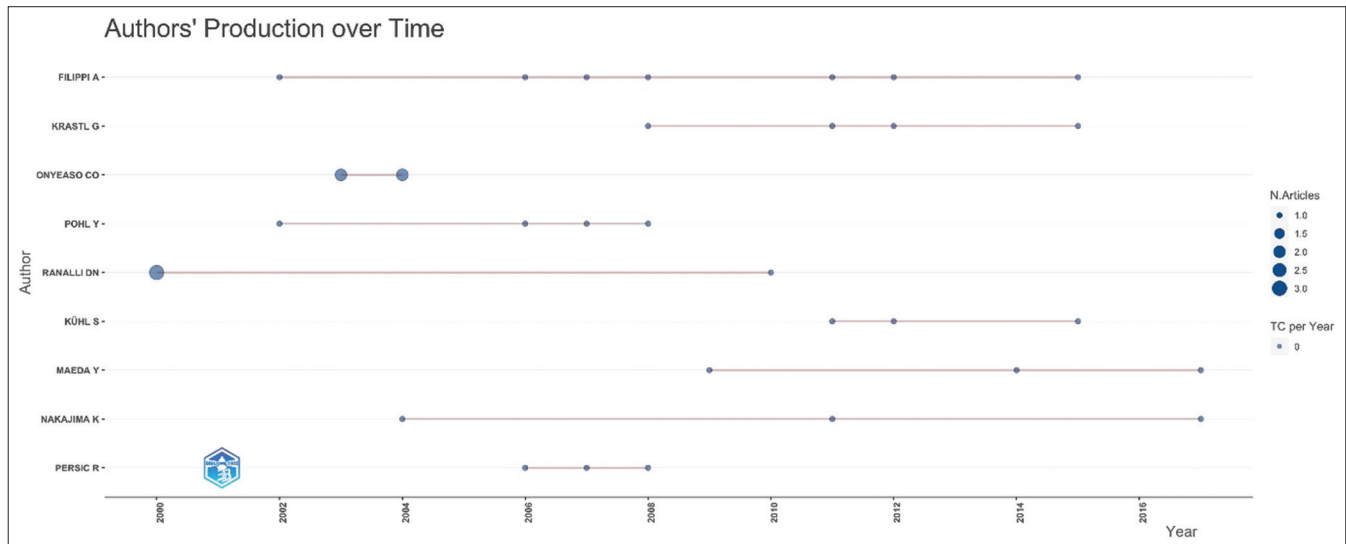
Graph 2: Most relevant authors

- It is important to note that this image only shows the author's publication output in a specific journal or database. The author may have published other works that are not shown here.

Figure 3 shows Federal University of Paraíba: With 10 articles attributed to this institution, it stands out as one of the leading contributors in sports dentistry research. Osaka University Graduate School of Dentistry:** Similarly, Osaka University Graduate School of Dentistry also has 10 articles associated with it, indicating a substantial presence and contribution to the field. The Ohio State University and University of Zagreb: Both institutions have 9 articles attributed to them, suggesting a strong research focus and output in sports dentistry. United States Air Force Academy: With 7 articles, the United States Air Force Academy also demonstrates a notable contribution to sports dentistry research. Istanbul University, Manchester Metropolitan University, University of Basel, University of Cagliari, and University of Leipzig:** These institutions have

contributed between 5 and 6 articles each, showcasing their involvement in the field but to a slightly lesser extent compared to the top institutions. Most Relevant Affiliation: Based on the data, the Federal University of Paraíba and Osaka University Graduate School of Dentistry emerge as the most relevant affiliations in sports dentistry research, with each institution having 10 articles associated with it. These institutions likely play pivotal roles in advancing research, fostering collaboration, and shaping the discourse within the field of sports dentistry. Their contributions highlight the importance of academic institutions in driving scientific progress and innovation in specialized areas such as sports dentistry.

Table 3 provides an overview of sports dentistry research across various countries, detailing article counts, single-country publications (SCP), multiple-country publications (MCP), frequency, and MCP ratio. The United States leads with 23 articles, demonstrating a significant presence in the field, mostly through SCPs. Brazil follows with 10 articles,



Graph 3: Shows, which shows the author's production over time

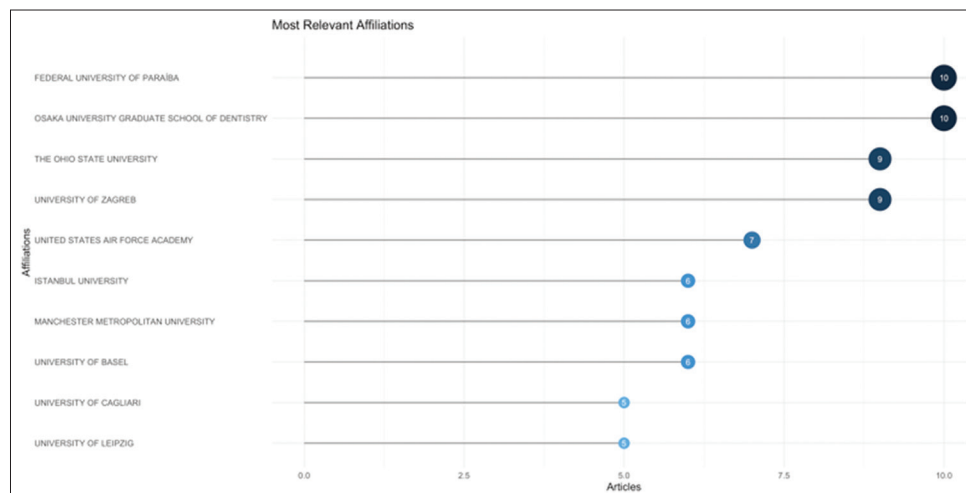


Figure 3: Most relevant affiliations on sport dentistry globally

showing a notable contribution and a relatively higher rate of international collaboration compared to the USA. Other countries such as Turkey, Switzerland, Japan, Nigeria, Australia, Canada, and Italy also contribute to sports dentistry research, each with varying levels of publication output and collaboration tendencies. Overall, the data highlight the diverse international landscape of sports dentistry research, with the USA and Brazil emerging as key contributors. Understanding these country-wise dynamics is essential for appreciating global research trends and fostering collaboration within the field.

Graph 4 is a scatter plot that shows the popularity of various topics related to mouth protectors and tooth injuries in sports over time. The X-axis shows the year, and the Y-axis shows the term frequency. The size of the bubbles represents the number of studies published on that topic in that year.

- The popularity of research on mouth protectors and tooth injuries in sports has increased over time. This is shown by

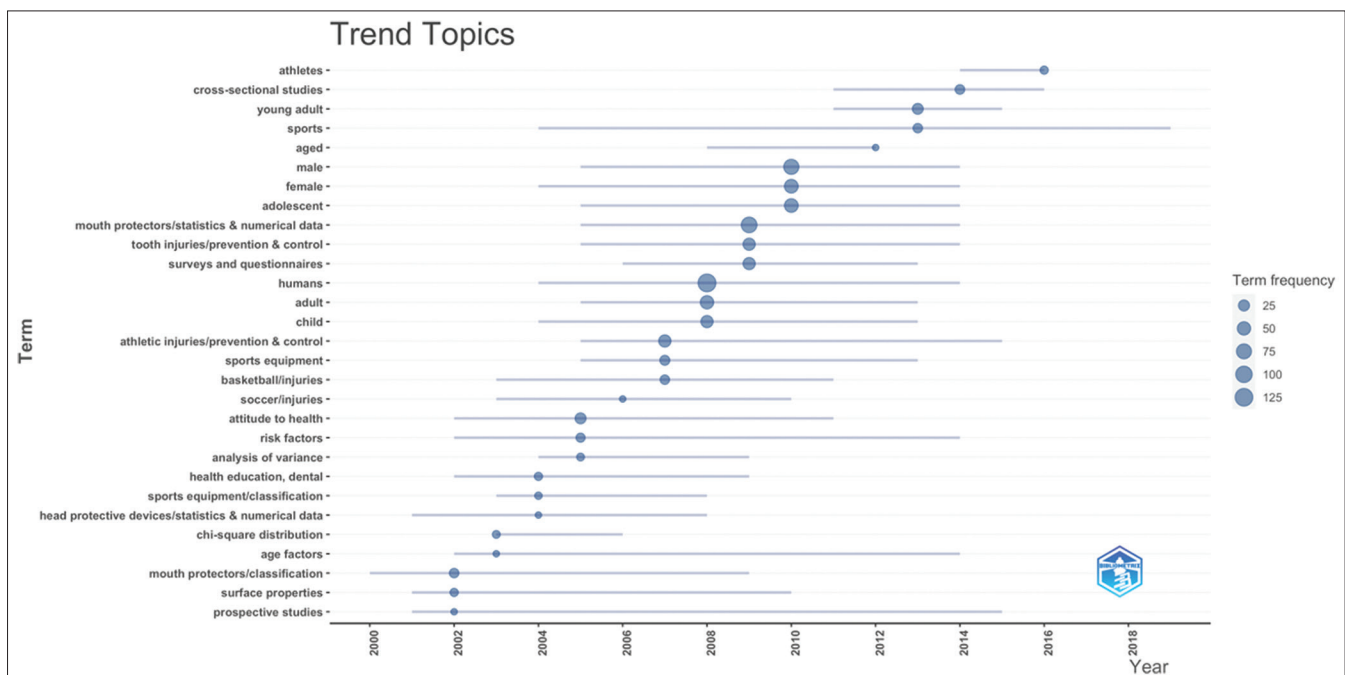
Table 3: Most_Relevant_Countries_By_Corresponding_Author

Country	Articles	SCP	MCP	Freq	MCP_Ratio
	46	46	0	0.341	0.000
USA	23	22	1	0.170	0.043
Brazil	10	9	1	0.074	0.100
Turkey	9	9	0	0.067	0.000
Switzerland	8	7	1	0.059	0.125
Japan	7	5	2	0.052	0.286
Nigeria	5	5	0	0.037	0.000
Australia	4	4	0	0.030	0.000
Canada	4	4	0	0.030	0.000
Italy	3	3	0	0.022	0.000

the overall upward trend in the term frequency over time. There has been a growing interest in research on mouth protectors for children. This is shown by the increasing number of studies published on the topic of “mouth protectors/child” in recent years. There has been a growing interest in research on the prevention of tooth injuries in sports. This is shown by the increasing number of studies published on the topics of “athletic injuries/prevention and control” and “sports equipment/classification” in recent years. There has been a growing interest in research on the biomechanics of tooth injuries. This is shown by the increasing number of studies published on the topics of “mouth protectors/surface properties” and “prospective studies” in recent years. It is important to note that this is just a general analysis of the trends in the image. A more detailed analysis would require looking at the specific studies that are included in the image.

Overall, the image shows that there is a growing interest in research on mouth protectors and tooth injuries in sports. This research is likely to lead to the development of new and improved mouth protectors that can help to prevent tooth injuries in athletes.

- Figures 4 and 5 show that the most frequent term is “humans” (131 times). This suggests that table is focused on research that is relevant to humans. The least frequent term is “child” (37 times). This suggests that there is less research on mouth protectors and tooth injuries in children compared to other groups. The average frequency is 60.80. The terms with frequencies above the average are “humans,” “mouth protectors/statistics and numerical data,” and “male.” This suggests that these are the most important topics covered in table.



Graph 4: Annual trend in scientometrics of sport dentistry



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It appears to be a scatter plot of research trends related to mouth protectors and tooth injuries in sports.

In Figure 6 Overall, the number of studies published on mouth protectors and tooth injuries in sports has increased over time. Overall, the number of studies published on mouth protectors and tooth injuries in sports has increased over time. This is shown by the upward trend in the term frequency over time.

- There has been a growing interest in research on mouth protectors for children. This is shown by the increasing number of studies published on the topic of “mouth protectors/child” in recent years.
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- There has been a growing interest in research on the biomechanics of tooth injuries. This is shown by the increasing number of studies published on the topics of “mouth protectors/surface properties” and “prospective studies” in recent years.

It is important to note that this is just a general analysis of the trends in the image. A more detailed analysis would require looking at the specific studies that are included in the image.

Overall, the image shows that there is a growing interest in research on mouth protectors and tooth injuries in sports. This research is likely to lead to the development of new and improved mouth protectors that can help to prevent tooth injuries in athletes.

DISCUSSION

Our findings revealed that the analysis covers the period from 2000 to 2023, encompassing 56 different sources and 135 documents. There is a concerning negative annual growth rate of -7.14%, indicating a decline in publication output over the specified timespan. The average number of citations per document is 0, suggesting limited attention or recognition within the academic community. Only 1 reference per document indicates a potentially limited scope or focus of the publications. 433 authors contributed to 135 documents, indicating a diverse group of researchers. Collaboration is prevalent, with only 17 out of 135 documents authored by a single individual. The average number of co-authors per document is 3.67. Journal articles dominate with 80 out of 135 documents falling into this category. International co-authorships are relatively low at 4.444%, suggesting limited global collaboration. The low average number of citations per document indicates limited impact within the academic community. Some documents received research support, primarily from non-U.S. government sources. These findings underscore challenges and shifts within sports dentistry research, including declining publication output, limited international collaboration, and low citation impact. Further investigation and strategic interventions are necessary to

address these trends and foster the growth and development of the field.

Approximately 10% of sports-related incidents result in head injuries, which may include mouth injuries. The severity of such injuries depends on the athlete's age and the nature of the sport. Oral injuries can significantly impact functionality, appearance, and mental well-being. In 25% of instances, tooth damage may result in pulp necrosis or significant discomfort. Examples of less severe injuries include fractures, enamel cracks, and concussions.^[12]

As per the American Dental Association (ADA), sport mouthguards have the potential to prevent over 200,000 oral injuries annually. Dentists, referees, and coaches play pivotal roles in promoting the acceptance and understanding of sport mouthguards among players. They are responsible for encouraging the use of mouthguards during both practice sessions and competitions. Dentists play a crucial role by educating trainers, coaches, athletes, parents, and school officials about different mouthguard options and their benefits. In addition, they offer custom-made mouthguards within their practices to ensure optimal protection.^[22]

According to research published in the Journal of the ADA (JADA),^[23] sports-related dental injuries constitute 13–39% of all dental injuries, with 2–18% affecting the craniofacial region. The National Federation of State High School Associations (NFHS) mandates only five sports: Football, ice hockey, lacrosse, field hockey, and wrestling, with wrestlers needing fixed orthodontic equipment to compete. Nonetheless, many high schools and institutions encourage the use of protective gear for contact sports.^[24]

Due to these factors, the sport mouthguard market is anticipated to grow significantly during the forecast period.

The statistics provided by the JADA highlight the prevalence and impact of sports-related dental injuries:

- Males experience dental trauma twice as often as females, with the maxillary central incisor being the most commonly injured tooth
- Compliance with mouthguard use is low across various sports; for instance, only about two-thirds of football athletes wear them
- In sports such as soccer, baseball, and softball, mouthguard usage is as low as 7%
- Basketball has the highest injury rate among male and female students due to contact and collision
- The NFHS mandates mouthguards for only four sports: Football, ice hockey, lacrosse, and field hockey
- Research underscores the need for more studies in sports dentistry and increased regulation and education on mouthguard use
- Studies show that mouthguards significantly reduce orofacial injuries, with basketball players facing a sevenfold increased risk without them
- Non-organized sports, including biking and skateboarding,

- also contribute to dental injuries among children
- Surveys in Texas high schools reveal that soccer and basketball have higher dental injury rates than football
- Athletes face a 10% chance of orofacial injury each season and a 33–56% chance during their playing career.^[25]

These statistics emphasize the importance of mouthguard use and highlight the need for more comprehensive protective measures in sports to mitigate dental injuries among athletes.

1. Opting for “Custom Made” mouthguards offers the optimal combination of protection and comfort, preferably fabricated in a dental laboratory under the guidance of a knowledgeable dentist. The dentist can assess any underlying issues and recommend a design tailored to the individual’s needs.
2. Despite the initial higher cost, “Custom Made” mouthguards prove more cost-effective in the long run. Investing in quality protection upfront can prevent potential dental injuries and associated expenses in the future. How much value do you place on preserving your smile?
3. Further research is necessary to conclusively determine the extent of concussion or brain damage reduction through mouthguard use. Nevertheless, mouthguards have demonstrated effectiveness in reducing dental trauma to the teeth, gums, lips, and cheeks over the past century.

CONCLUSION

This bibliometric analysis delved into the world of sports dentistry research, examining publication trends, author collaborations, and thematic landscapes. The journey began with the promise of R software as a champion, wielding bibliometric data to illuminate the playing field. While exciting discoveries were made, the results also revealed areas where the field might require renewed focus and strategic adjustments.

Key findings

- A concerning decline in publication output over the past two decades suggests a potential shift in research priorities or resource allocation. Despite diverse authorship and collaboration, international co-authorship remains limited, indicating opportunities for fostering global partnerships. The low average citation count raises questions about the overall impact and dissemination of sports dentistry research findings. While journal distribution presents a vibrant landscape, further analysis could identify emerging areas of interest and potential gaps in knowledge.

Looking Ahead: These findings call for further investigation into the factors driving the decline in publication output and the potential need for revitalizing research efforts. Encouraging international collaboration and promoting wider dissemination of research results could enhance the impact and influence of sports dentistry research. By capitalizing on the strengths identified, such as diverse authorship and a vibrant journal landscape, the field can navigate the evolving research landscape and continue to safeguard athletes’ smiles on and off the playing field.

Recommendations

- Conduct in-depth analyses to understand the reasons behind the publication decline
- Implement strategies to encourage international collaboration in research projects
- Explore innovative methods for disseminating research findings to a wider audience
- Identify emerging research areas and invest in studies that address critical knowledge gaps
- By embracing these recommendations and leveraging the insights gained from this bibliometric analysis, the field of sports dentistry can chart a course toward a brighter future, ensuring athletes benefit from the latest research and innovations, empowering them to conquer the arena with not only confident smiles but also optimal oral health.

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