ORIGINAL RESEARCH

Exploration and Bibliometric Mapping of Scientific Production on Quality of Life, Social Impact, and Security in Love Relationships in Patients with Dental Prostheses

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Abstract

Aim: To explore and conduct a bibliometric mapping of scientific production on quality of life, social impact, and security in love relationships in patients with dental prostheses.

Materials and methods: This study is a bibliometric, retrospective, observational analysis of scientific publications indexed in Scopus from 2017 to 2022. The search was conducted on March 8, 2023, using the MESH thesaurus and a defined search strategy. Fifty-two relevant studies were identified and exported to the SciVal program for further analysis. Various bibliometric indicators were used to analyze scientific production, including number of citations, publication, authorship, institution and collaboration, journal quartile, country of origin, h-index, CiteScore 2020, SCImago Journal Rank (SJR), Field Weighted Citation Impact (FWCI), and Source Normalized Impact per Paper (SNIP).

Results: Most of the articles (39) were in the highest quality quartiles (Q1 and Q2). Brazil produced a total of 15 scientific publications with a domain-weighted impact of 0.65, while Germany produced a total of 11 publications with a domain-weighted impact of 3.15. The results show that international collaboration (32.7%) and national collaboration (38.5%) are more frequent. The most influential author is Daniel Ralph Reißmann with a total of 72 publications followed by Oliver Schierz with 27 publications. German institutions (University of Hamburg, Leipzig University, and Ludwig Maximilian University of Munich) lead in scientific productivity. The Journal of Prosthetic Dentistry (Q1) has the highest number of articles (7) and a citation-to-publication ratio of 14.7.

Conclusion: Scientific production on quality of life in patients with dental prostheses is still scarce, although its dissemination is mainly in high-impact scientific journals.

Clinical significance: This study provided a deeper understanding of how dental prostheses affect people's lives. This can provide practitioners with valuable information to make clinical treatment decisions to improve quality of life. In addition, it can guide future studies to deepen the understanding of this topic in the clinical setting.

Keywords: Bibliometric analysis, Dental protheses, Social impact, Sexual performance.

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Introduction

Dental prostheses have become the standard for the treatment of missing or lost teeth, as they are instrumental in improving the quality of life (QoL) and functional performance of individuals, especially in implant-supported reconstructions.[1] Currently, most implants are used for the rehabilitation of edentulous patients.[2] Modern dentistry offers several options for restoring partially edentulous teeth, such as removable dentures and dental implants, which are viable ways to replace missing teeth. In addition to improving esthetic appearance, dentures also provide other important benefits, such as reduced occlusal stress on natural teeth, improved oral function, and increased comfort.[3]

With the development of appropriate dental augmentation techniques, increasingly satisfactory treatment results have been obtained. Modern surgical and prosthetic procedures allow better replacement of missing teeth.[4] A recent study found that treatment with two mandibular implants in dentures offers improved masticatory efficiency and QoL in rehabilitated patients compared with conventional dentures.[5] It is also very important to consider the social impact of patients wearing dental prostheses who are generally psychologically compromised. Besides, it is important to consider both facial functionality and esthetics when addressing tooth loss, as patients may feel constant anxiety due to changes in their appearance. Tooth loss can result in a prominent jaw, arched cheeks, sunken corners of the mouth, and receding lips.[6]

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Implant-supported dentures can improve both patient satisfaction and the ability to chew, speak, and improve esthetics.[7,8] On the other hand, a denture can be an effective solution to correct jaw relationships that have been altered by tooth loss.[9]

Improving the treatment and quality of patient care is essential to obtain satisfactory results. In this regard, it is important to share information with potential patients to support their treatment decisions and to learn about possible outcomes. In addition, it is important to remember that some patients may experience long-term problems even after the end of treatment. Therefore, assessing patients' QoL is crucial to predict treatment success and make informed decisions. In fact, several studies have shown that QoL is a determining factor in patient survival and recovery.[10]

The investigation and bibliometric analysis of scientific literature on the QoL, social impact, and sexual satisfaction (esthetic satisfaction) of individuals with dental prostheses holds significant value for their social and sexual well-being. By examining existing research on these subjects, the study can offer valuable insights into how dental prostheses may influence a person's social interactions, relationships, and sexual fulfillment (security in love relationships).[1–5] All this is a fundamental research topic in various fields, including medicine, psychology, and science. However, as QoL is a complex concept that may vary from person to person, it is important to study its specific characteristics.[11]

Therefore, the aim of this research is to analyze the scientific production related to QoL, social impact, and sexual satisfaction in patients using dental prostheses.

Materials and Methods

Study Design

A retrospective and observational study was conducted with a bibliometric approach, which focused on the evaluation of scientific publications indexed in Scopus during the period from 2017 to 2022.

Search Strategy

On March 8, 2023, an information search was conducted in Scopus, which corresponds to a resource that contains a wide variety of specialized journals in health. To carry out the research, the MESH thesaurus was used, and a search strategy was defined using two logical operators: "AND" and "OR"; in addition, the search was limited to the area of dentistry and the TITLE and ABSTRACT fields. The search strategy used is detailed below: TITLE-ABS ("dental prothesis" OR "Dental Prostheses" OR "Prostheses Dental" OR "tooth prosthesis" OR "artificial teeth" OR "artificial tooth" OR "ceramic artificial teeth" OR "dental implant prosthetic teeth bar" OR "dental implant suprastructure permanent preformed" OR "dental prosthesis retention" OR "dental prosthesis device" OR "denture prosthesis" OR "gold artificial teeth" OR "preformed permanent dental implant suprastructure" OR "tooth artificial") AND TITLE-ABS ("Dental Prosthesis Implant Supported" OR "Implant Supported Dental Prosthesis" OR "Dental Prostheses Implant-Supported" OR "Implant Supported Dental Prosthesis" OR "Implant Supported Dental Prostheses" OR "Prostheses Implant Supported Dental" OR "Prosthesis Implant Supported Dental" OR "Denture Implant*Supported" OR "Implant Supported Denture" OR "Dentures Implant Supported" OR "Implant Supported Denture" OR "Prosthesis Dental Implant Supported" OR "Dental* Implant Supported Prosthesis" OR "Implant Supported Prosthesis Dental*" OR Prosthesis Dental* Implant Supported) AND TITLE-ABS ("health related quality of life" OR "HRQL" OR "life quality" OR "Health-Related Quality Of Life" OR HRQO) AND TITLE-ABS ("sexual satisfaction" OR "sexual behavior" OR "Orgasms" OR "Sexual Satisfaction" OR "Satisfaction Sexual" OR "Sexual Satisfactions" OR "Sexual Gratification" OR "Gratification, Sexual" OR Sexual Gratifications) AND TITLE-ABS ("Change* Social" OR "Social Changes" OR "Social Impact" OR "Impact* Social" OR "Social Impacts" OR "Modernization" OR "Social Development" OR "Development Social" OR "Developments Social" OR Social Developments) AND SUBJAREA (DENTISTRY).

Fifty-two relevant studies were identified, all available in the Scopus database during the period from 2017 to 2022. These documents were exported to the SciVal program for further analysis using various bibliometric indicators.

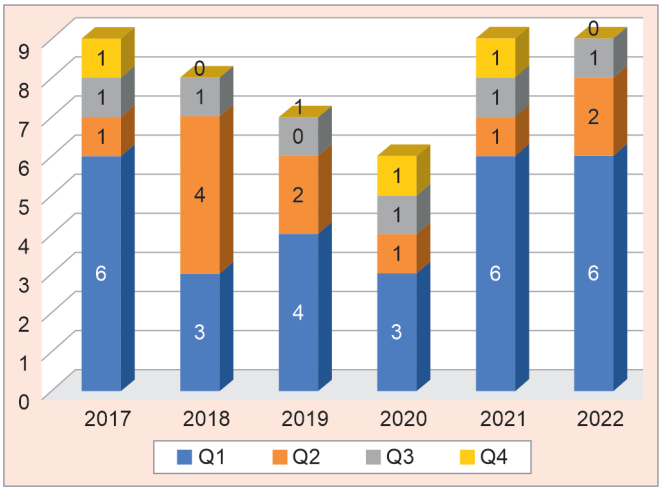


Fig. 1: Publications by CiteScore quartile

Bibliometric Indicators

Several metrics were used to analyze scientific production, including number of citations, publication, authorship, institution and collaboration, journal quartile, country of origin, h-index, CiteScore 2020, SCImago Journal Rank (SJR), Field Weighted Citation Impact, and Source Normalized Impact per Paper (SNIP).

Data Analysis

The SciVal program (Elsevier) was used to carry out this study, which allowed the export of metadata from scientific publications. Then, for the analysis of categorical variables, percentages and frequencies were used, and statistical tables and graphs were prepared for their presentation.

Results

Figure 1 shows the number of scientific articles on the ranking of scientific journals according to their impact and quality in the scientific field. The data show that most articles are in the highest quality quartiles (Q1 and Q2) compared with the lowest quality quartiles (Q3 and Q4) in each of the years studied (2017–2022). After applying the selection criteria to an initial pool of 131 articles, 28 were identified as Q1 articles, 11 as Q2 articles, 4 as Q3 articles, and 4 as Q4 articles. This process allowed for the identification of high-quality research that met the study's rigorous standards.

The 50 most relevant keywords were identified, with the green cluster concentrating the highest number of these key phrases, the most dominant being "Oral Health." Likewise, it was observed that



Fig. 2A: Key phrase analysis

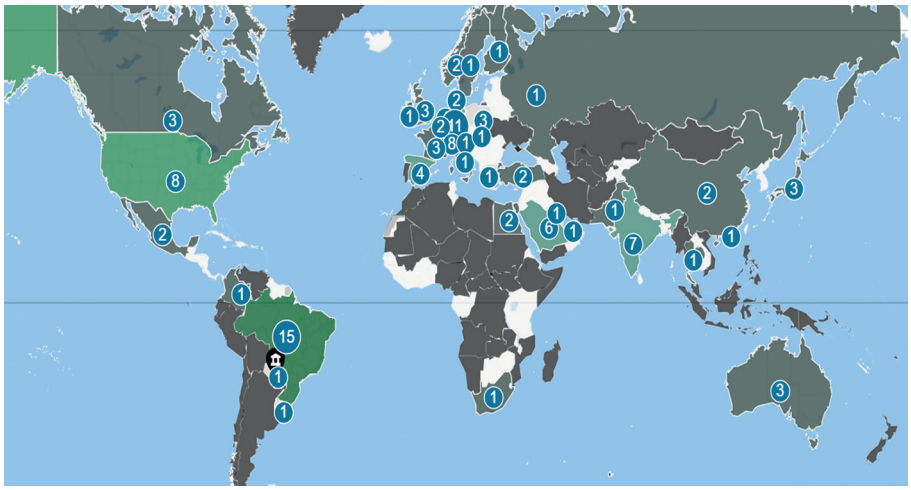


Fig. 2B: Top 100 countries/regions in this publication set, by scholarly output

the word "Quality of Life" is also important among the key phrases, followed by the blue cluster with "Dental Implant" and the lead cluster with "Fixed Partial Denture" (Fig. 2A).

This figure displays the academic output and citation counts of various countries in the field of scientific research. Brazil produced 15 scientific publications with an average of 5.5 citations per publication, a domain-weighted impact of 0.65, and a total of 82 citations. Germany produced 11 scientific publications with an average of 9.0 citations per publication, a domain-weighted impact of 3.15, and a total of 99 citations. Switzerland produced 8 scientific publications with an average of 17 citations per publication, a domain-weighted impact of 1.68, and a total of 136 citations. The United States published 8 academic journals with an average of 20.6 citations per journal, a domain-weighted impact of 3.75, and a total of 165 citations. India produced 7 academic journals with an average of 1.4 citations per publication, a domain-weighted impact of 0.18, and a total of 10 citations. These data provide valuable insights into the academic productivity and influence of each country in the field of scientific research (Fig. 2B).

The results show that international collaboration and national collaboration are important sources of academic output. The international collaboration generated 17 publications with an average of 9.8 citations per publication and representing 32.7% of the total number of publications. On the other hand, national collaboration represented 38.5% and had an average of 8.9 citations per publication. No academic output was produced through single authorship (Table 1).

The results indicate that the publication of articles in the field of Periodontology has had a greater impact compared with other fields in Dentistry. Although only two articles were published in this field, they received a total of 26 citations and a rate of 13 citations per publication. Meanwhile, Miscellaneous Dentistry had a lower impact, with only one published article receiving 19 citations (Table 2).

Table 1: Collaboration of scientific production

Metric	*Scholarly output*	*Citations*	*Citations per publication*	*Field-weighted citation impact*	*%*
International collaboration	17	166	9.8	1.96	32.7
Only national collaboration	20	179	8.9	1.27	38.5
Only institutional collaboration	15	117	7.8	1.28	28.9
Single authorship (no collaboration)	0	0	0	0	0.0

Table 2: Publications by subject area

Subcategory	*Scholarly output*	*Citations*	*Authors*	*Citations per publication*	*Field-weighted citation impact*
General dentistry	33	214	174	6.5	1.53
Oral surgery	17	222	97	13.1	1.17
Periodontics	2	26	9	13	3.76
Dentistry (miscellaneous)	1	19	9	19	1.5

Table 3: Top 10 most outstanding authors in scientific production

Name	*Country*	*Scholarly output*	*Citations*	*Citations per publication*	*Field-weighted citation impact*	*h-index*
Reißmann, Daniel Ralph		5	72	14.4	6.57	27
Schierz, Oliver		5	27	5.4	6.19	18
Edelhoff, Daniel		5	24	4.8	4.82	40
Wolfart, Stefan		4	29	7.3	5.9	32
Wöstmann, Bernd		3	20	6.7	7.49	26
Hannak, Wolfgang B.		3	20	6.7	7.49	10
Boldt, Julian		3	20	6.7	7.49	9
Jahn, Florentine		3	20	6.7	7.49	7
Luthardt, Ralph Gunnar		3	20	6.7	7.49	26
Heydecke, Guido		3	62	20.7	7.73	36

Among the 10 most prominent authors in the field of dentistry, according to their scientific output, citations, and the impact of their publications. The most influential author is Daniel Ralph Reißmann with a total of 72 publications and a high average number of citations per publication, closely followed by Oliver Schierz with 27 publications. The list also includes other authors such as Stefan Wolfart and Bernd Wöstmann, who have also had a significant impact on the field of dentistry (Table 3).

The University of Hamburg (Germany) is among the top 10 institutions in terms of academic output, with the highest number of publications (5) and academic citations (72). On the other hand, the University of Bern in Switzerland has 25.3 citations per publication, while the University of Geneva has the lowest citation impact weighted by field, with 0.97 (Table 4).

Among the top 10 outstanding Scopus journals, the Journal of Prosthetic Dentistry (Q1) has the highest number of articles (7) and a citation per publication ratio of 14.7. The Clinical Oral Implants Research, ranked Q1, has the highest SNIP and CiteScore with 2.419 and 9.3, and the second highest SJR score of 2.093 (Table 5).

Discussion

The choice of fixed dental implants or removable prostheses depends on several factors, such as the quantity and quality of available bone, the location and number of teeth, and their lifestyles. Fixed prostheses may offer greater stability and functionality than removable prostheses, but their placement requires greater precision in the planning and placement of dental implants and reduces the complexity of the surgical procedure.[12,13] High prosthesis survival and low complication rates are important requirements for the overall success of implant-based rehabilitation, as prosthesis failure can jeopardize the entire rehabilitation.[14]

Table 4: Top 10 leading institutions in scientific production

Institution	*Country*	*Scholarly output*	*Citations*	*Authors*	*Citations per publication*	*Field-weighted citation impact*
University of Hamburg		5	72	4	14.4	6.57
Leipzig University		5	27	4	5.4	6.19
Ludwig Maximilian University of Munich		5	24	4	4.8	4.82
RWTH Aachen University		4	29	2	7.3	5.9
University of Würzburg		4	22	4	5.5	5.83
University of Bern		3	76	13	25.3	2.55
University of Geneva		3	10	5	3.3	0.97
Friedrich Schiller University Jena		3	20	1	6.7	7.49
Justus Liebig University Giessen		3	20	1	6.7	7.49
Charité – Universitätsmedizin Berlin		3	20	2	6.7	7.49

Table 5: Top 10 scopus sources

Scopus source	*Cuartile*	*Publications*	*Citations per publication*	*SNIP*	*CiteScore 2021*	*SJR*
Journal of Prosthetic Dentistry	Q1	7	14.7	1.873	6	1.11
Journal of Dentistry	Q1	5	14.2	1.917	6.8	1.114
Clinical Oral Investigations	Q1	3	4.3	1.779	5.8	0.923
International Journal of Prosthodontics	Q2	3	1	0.826	2.7	0.587
Journal of Evidence-based Dental Practice	Q1	3	4	1.962	6	1.209
Pesquisa Brasileira em Odontopediatria e Clinica Integrada	Q3	3	0	0.438	1.6	0.195
Clinical Oral Implants Research	Q1	2	29	2.419	9.3	2.093
Gerodontology	Q1	2	0	1.456	4.5	0.733
International Journal of Oral and Maxillofacial Implants	Q1	2	8.5	1.392	4.7	0.942
Journal of Oral Rehabilitation	Q1	2	17.5	1.67	4.9	0.936

SJR, scimago journal rank; SNIP, source-normalized impact per paper

Clinically relevant procedures are necessary to detect variations and correct defects. In many cases, mapping is the only practical way to explore and quantify these elements, making it an increasingly useful tool.[15] Companies are constantly working on creating new zirconia ceramics for dental restorations to ensure mechanical strength while improving translucency.[16–18]

It is imperative to understand how oral health and overall health are related, so it is important to assess the QoL and overall health. In a previous bibliometric study (2023), it was found that there is high productivity in studies linked to the QoL in oral health, mentioning that oral health-related QoL is a high-impact topic in dental health care, it provides valuable guidance for public health management and health policy development. Oral health-related QoL-related research presents a dynamic landscape and is expected to continue to show high productivity and broad application in the future.[19] In contrast to this, the present study shows findings that reflect that QoL in patients with dental prostheses is a field that needs further exploration and that in turn represents an opportunity to guide studies as well as dental services.

Regarding the participation in research in this field of knowledge, Clementino et al.[20] reported that among the 100 most cited research the role of Germany was one of the most important and concentrated 11 scientific articles. These data agree with the finding of this study, which demonstrates that authors and

institutions from Germany are at the forefront of research on the QoL in users of dental prostheses.

For the development of research, the promotion and articulation of research groups are necessary, especially in a scenario such as that reported in this bibliometric study in which it has been estimated that international collaboration represents approximately 30% of all scientific production.[11–15]

The aim of dental prosthetic treatment is to correct occlusal alterations and prevent future diseases related to tooth loss. It also seeks to rehabilitate the patient's functional oral capacity and restore lost esthetics. The success of prosthodontic treatment depends on the survival of the prosthesis and its ability to meet biological objectives. Therefore, dentists should continue to emphasize the importance of maintaining good oral hygiene and using interdental aids to prolong the life of dentures.[21]

There is evidence showing the relationship between edentulism and its impact on daily performance, social impact, esthetic satisfaction, and QoL. Dental prostheses provide security and confidence,[22] which directly impacts personal, professional, and romantic relationships. Several factors, such as chewing ability, appearance, speech, and denture cleanliness, can positively impact the overall satisfaction of most patients. Edentulism can have a negative impact on social life and sexual performance or confidence. For example, a study by Heydecke et al.[23] demonstrated that mandibular overdentures provide greater improvement in discomfort during intimate activities than new conventional mandibular prostheses after two months.

Finally, it is important to note that the information search for this study was conducted solely in the Scopus database, which may have excluded relevant scientific publications available in other databases such as Embase, PubMed, or Web of Science. Additionally, potential errors in the indexed metadata could impact the accuracy of the bibliometric indicators. Despite these limitations, the results provide valuable insights into current research in this field and can serve as a useful resource for future studies.

Conclusion

Scientific production on QoL, social impact, and sexual satisfaction in patients with dental prostheses is still scarce and has remained constant in recent years; however, these are mostly disseminated in scientific journals of the Q1 quartile. In addition, national collaboration is the most frequent and it is recognized that German institutions and authors are the most influential in this subject.

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