Review Article

Global Research Landscape linking Oral and Ocular Health: A Bibliometric Analysis (2000-2025)

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ABSTRACT

This study examined how research connecting oral and ocular health has developed over the past two decades. Interest in this topic has grown because certain dental procedures, immune-related disorders, and severe drug reactions can affect both the mouth and the eyes. To understand how the field has evolved, a search was carried out in the Dimensions database for studies published between 2000 and 2025. After applying the inclusion criteria, 351 articles were analyzed using bibliometric tools to explore publication trends, citation patterns, country contributions, and connections between studies.

The results show a steady publication growth peaking in 2024, though with limited citation impact. *Oral Surgery, Oral Medicine, Oral Pathology, and Oral Radiology,* and *BMC Oral Health* are identified as the most productive journals. The United States and India are the most productive countries. Highly cited works focus on ocular complications from dental local anesthesia, occupational risks, autoimmune mucosal diseases, and severe drug reactions. Research trends indicate an evolution from procedural complications to systemic and immune-mediated disorders, and, more recently, to infectious and vascular conditions. The most studied health conditions with both oral and ocular manifestations include Sturge–Weber syndrome, diabetes, Sjögren's syndrome, Behçet's disease, mucous membrane pemphigoid, orbital apex syndrome, and cavernous sinus thrombosis. Bibliographic coupling identifies case reports related to ocular complications of dental anesthesia, including vision loss, diplopia, ophthalmoplegia, ptosis, Horner's syndrome, and Harlequin syndrome. Limited overlap between citation-coupled and highly cited studies suggests contemporary research diverges from earlier foundational work. These findings indicate that oral–ocular health connections constitute a growing yet fragmented research domain that requires greater interdisciplinary collaboration to advance clinical and translational applications.

INTRODUCTION

Although the oral and ocular systems are often perceived as distinct, they demonstrate physiological and pathological interconnections. Growing evidence links oral health and ocular disease through shared inflammatory pathways, common systemic conditions, and overlapping risk factors [1,2]. For instance, one retrospective cohort study found that individuals with periodontitis had a significantly higher risk for developing Primary Open-Angle Glaucoma [3]. Similarly, recent epidemiological data from a community sample of Japanese adults demonstrated an association between Dry Eye Disease and periodontal disease, even when controlling for age, sex, tooth count, and lifestyle factors [4]. A study found that oral pathogens, particularly *Porphyromonas gingivalis*, can be detected in ocular tissues and may contribute to the development of inflammatory eye diseases through systemic infection pathways [5]. These evidence support the view that disruptions in oral health, through inflammation, microbial imbalance, or both, may influence ocular disease processes.

Moreover, given that oral conditions remain among the most prevalent non-communicable diseases worldwide,

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further investigation of these links is warranted: According to the World Health Organization, nearly 3.7 billion people experienced one or more oral conditions in 2021, while severe periodontitis alone affected more than 1 billion people in 2019 [6]. Another study by Bernabé et al. (2020) also reported that oral conditions affected about 3.5 billion people globally in 2017, with severe periodontitis, dental caries, and tooth loss being the most prevalent contributors to the global burden of oral disease [7].

Similarly, ocular surface disease, particularly dry eye disease, is common and exhibits clear demographic patterns: global prevalence is estimated at 11.6 %, with higher rates in women and with increasing age [8]. These patterns provide an epidemiologic basis for comorbidity, since many systemic disorders, such as diabetes, autoimmune conditions such as Sjögren's and Behçet's syndromes, manifest with both oral and ocular signs, forming patient populations in which dental and ophthalmic issues often converge [9-12].

Despite the clinical plausibility and some empirical signals, the research landscape that maps where, how much, and with what focus investigators study the oral–ocular interface has not been systematically characterized. This bibliometric analysis aims to represent the global research landscape on the relationship between oral and ocular health using bibliometric methods with the following objectives:

1. To analyze patterns in publication output and citation performance within research connecting oral and ocular health.
2. To identify the most productive journals contributing to this field.
3. To analyze the geographical distribution of global research output.
4. To identify the most common research themes, particularly clinical conditions and syndromes that affect both oral and ocular health.
5. To map the conceptual framework and intellectual relationships within the research domain
6. To determine the most influential articles that have shaped research in the domain.

The findings of this study can guide clinicians and policymakers in developing cross-disciplinary screening pathways, preventive measures, and shared management approaches for patients with overlapping oral and ocular conditions. In addition, it will inform about the research gaps and future research priorities.

Keywords

Oral–ocular health; Periodontitis; Dry eye disease; Sjögren's syndrome; Systemic inflammation; Bibliometrics; Interdisciplinary research; Dimensions; VOSviewer, Biblioshiny

MATERIALS AND METHODS

This study adopted a bibliometric design to map the global landscape of research on the link between oral and ocular health. The data were retrieved from the Dimensions database (Digital Science, UK), chosen for its comprehensive coverage of multidisciplinary publications and reliable citation [13,14]. The analysis included articles published between 2000 to 2025 to capture two and a half decades of research evolution. The following type of analysis was performed to achieve the objectives-

- Annual publication and citation counts were used to examine publication and citation patterns.
- A journal productivity analysis (based on the number of articles published) was conducted to identify the most productive journals in this field.
- Country publication counts were used to assess the geographical distribution of global research output.
- Trend topic analysis (based on the titles) was carried out to identify major research themes and common oral–ocular conditions or syndromes.
- Bibliographic coupling was employed to map the conceptual framework and intellectual linkages within the field.
- Citation analysis was used to determine the most influential articles shaping the research domain.

Search Strategy

A structured search was conducted on October 28, 2025, in the Dimensions database using combinations of keywords representing oral and ocular domains and appropriate Boolean operators.

The search string used was as follows:

("oral health" OR "dentistry" OR "periodontal disease" OR periodontitis OR "oral microbiome" OR "oral cavity" OR "dental treatment" OR "dental anesthesia" OR "dental local anaesthesia" OR "intraoral local anesthesia" OR "removal of teeth" OR "tooth extraction" OR "dental extraction" OR "molar extraction" OR "extraction of tooth" OR "inferior alveolar nerve anesthesia" OR "alveolar nerve block" OR "root fracture" OR "dental infection" OR "endodontic treatment" OR "oral complication" OR "dental complication") AND ("ocular" OR "ophthalmology" OR "retinal disease" OR "vision disorder" OR "eye disease" OR "eye disorder" OR "visual impairment" OR "vision loss" OR "visual loss" OR "eye damage" OR "oro-ocular" OR "oral ocular" OR "ocular complications" OR "ophthalmic complication" OR "ophthalmologic

complications" OR "retinal artery occlusion" OR "ptosis" OR "orbital apex syndrome" OR "ocular complication" OR "amaurosis" OR "mydriasis" OR "blindness" OR "optic neuropathy" OR "oculomotor" OR "trochlear nerves" OR "retrobulbar hemorrhage" OR "miosis" OR "anisocoria" OR "orbital abscess" OR "endophthalmitis" OR "intraorbital abscess" OR "Subperiosteal abscess" OR "ocular microbiota") NOT ("animal" OR "mice" OR "rat" OR "canine" OR "monkey" OR "rabbit" OR "pig" OR "dog" OR "guinea") NOT ("review" OR "commentary" OR "naked eye")

Data Extraction and Analysis

All retrieved records were exported from Dimensions in Excel and CSV formats containing metadata (authors, title, source, abstract, year, country, and citations). Duplicate and irrelevant records were removed after manual screening based on title and abstract relevance. The adapted PRISMA flow chart [15] for bibliometric analysis summarized the study selection process. Bibliometric and visualization analyses were conducted using:

1. VOSviewer [16] (v.1.6.20) – for generating bibliographic-coupling and citation network maps.
2. Biblioshiny [17](R interface of Bibliometrix, v.4.2.2) – for descriptive statistics, publication and citation trend analysis, and thematic analysis.

Thresholds for inclusion in network maps generated by VOSviewer were set according to data density: a minimum of 10 citations per document.

Inclusion Criteria

1. Original research examining the relationship or interaction between oral and ocular health.
2. Original research reporting ocular injury or ocular complications as an occupational hazard in dentistry.
3. Original research investigating oral or ocular components of syndromes or conditions known to present with both oral and ocular manifestations.

Exclusion Criteria

1. Studies evaluating the impact of visual impairment on oral health without addressing ocular health mechanisms or pathways.
2. Studies focused exclusively on either oral health or ocular health, with no examination of their interrelationship.
3. Non-original articles, including reviews, commentaries, editorials, letters, and conference abstracts.
4. Original research involving syndromes or conditions with known oral and ocular manifestations in which the primary focus of the study is unrelated to oral–ocular health (e.g., studies centred on mental health, cognitive outcomes, or other non–oral/ocular domains).

Ethical Considerations

As this study used secondary data from a publicly available bibliographic database, no ethical approval was required. No human participants or identifiable personal data were involved. However, data handling followed responsible research and open-science principles, ensuring transparency, reproducibility, and proper citation of all bibliometric sources.

Methodological Limitations

While VOSviewer and Biblioshiny offer powerful visualization capabilities, graphical representations may not display all items due to high network complexity and spatial arrangement constraints applied by the layout algorithms.

RESULTS

Search Results

A total of 1371 articles were identified in the Dimensions database using the search string. Only articles published in relevant research fields were selected using the filter in the database, after which 1201 articles remained. Subsequent filtering by publication year and document type further reduced the dataset to 846 records. After manual screening of titles and abstracts, 351 articles relevant to the topic were included in the study. The article selection process is summarized in the flow diagram (Figure 1).

Main Information of the Dataset

The bibliometric dataset retrieved from the Dimensions database includes 351 documents published between 2000 and 2025 across 250 journals. The annual growth rate of 4.13% indicates a consistent upward trajectory in research activity over the past 25 years. The average age of publications is 8.66 years. The documents received an average of 8.7 citations per article, and 4,867 references were cited across the dataset. A total of 1,765 authors contributed to the literature, with 21 being single-authored publications. The average number of co-authors per document was 5.26, while the international co-authorship rate is 7.69%.

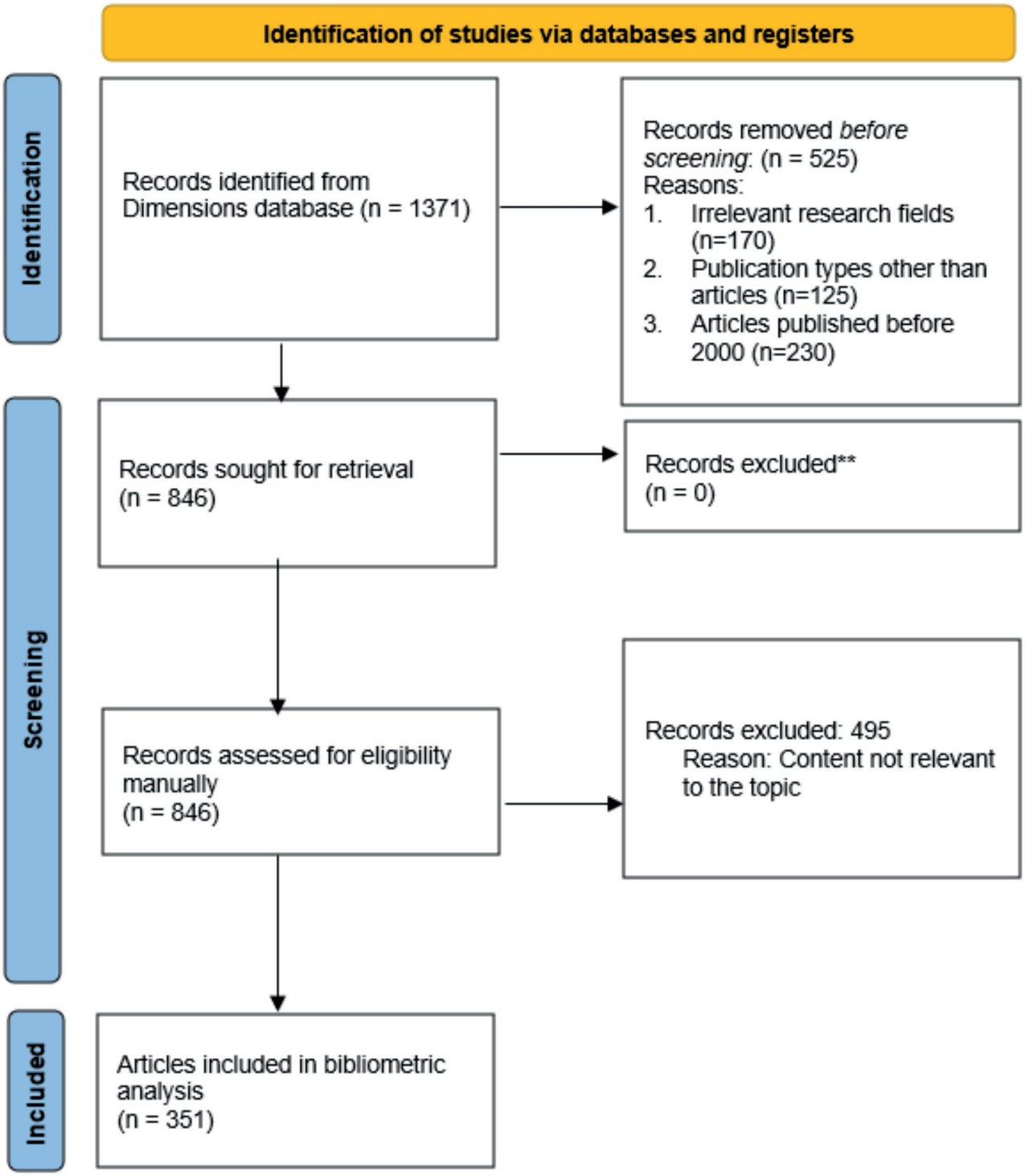

Figure 1: Study Selection process for the bibliometric analysis of literature linking oral and ocular health.
Illustration Credit: Namrata Dagli.

Publication and Citation Trends

The annual publication trend for studies examining the connection between oral and ocular health, based on data from the Dimensions database (Figure 2), shows a gradual, uneven growth pattern from 2000 to 2025. The number of documents (N) increased notably after 2019, peaking around 2024. In contrast, the mean total citations per article (MeanTCperArt) fluctuated considerably over the period, with distinct citation peaks around 2000 and 2005, followed by a steady decline after 2017. The mean total citations per year (MeanTCperYear) remained consistently low throughout the period, suggesting that annual citation accumulation was lower than overall output. Despite intermittent spikes in productivity and total citations, the overall trajectory indicates a gradual broadening of the research base rather than explosive growth.

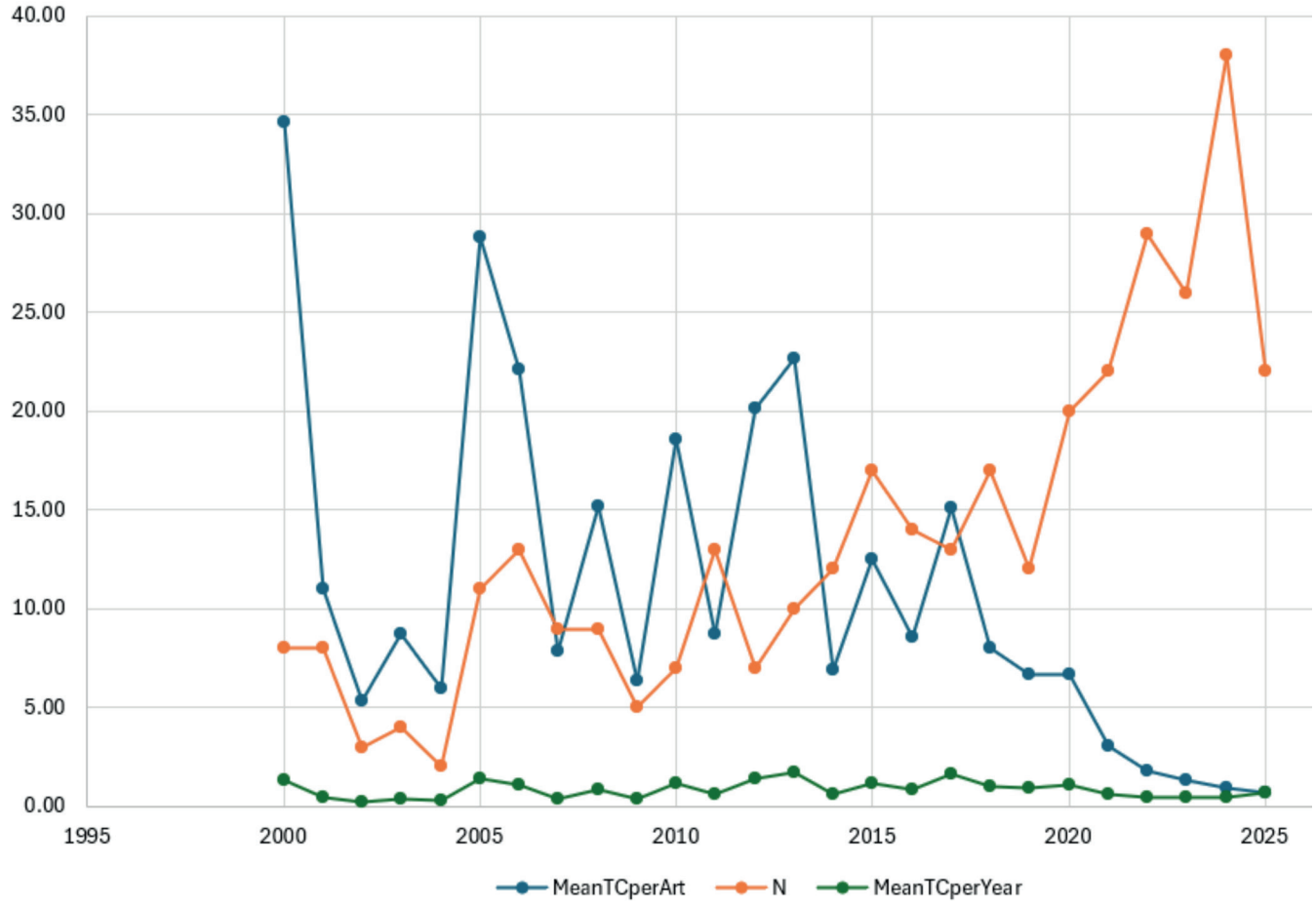

Figure 2: Publishing and citation trends of studies examining the connection between oral and ocular health (Database-Dimensions).

Illustration Credit: Namrata Dagli.

Most Productive Journals

Figure 3 shows the journals with the highest number of publications linking oral and ocular health. The highest number of articles appeared in *Oral Surgery Oral Medicine Oral Pathology and Oral Radiology* (17 documents), indicating that much of the research originates from clinical and diagnostic perspectives in dental medicine. *BMC Oral Health* followed with eight publications, reflecting growing engagement from open-access platforms that encourage interdisciplinary dissemination. *Annals of the Rheumatic Diseases* and the *Journal of Craniofacial Surgery* each published six papers. *Special Care in Dentistry* published five papers, and *Cureus*, *Journal of Maxillofacial and Oral Surgery*,

Journal of Oral and Maxillofacial Surgery, *Ophthalmic Plastic and Reconstructive Surgery*, and *The Journal of Periodontology* each featured four publications, demonstrating the field's intersection across oral surgery, ocular reconstruction, and periodontal health.

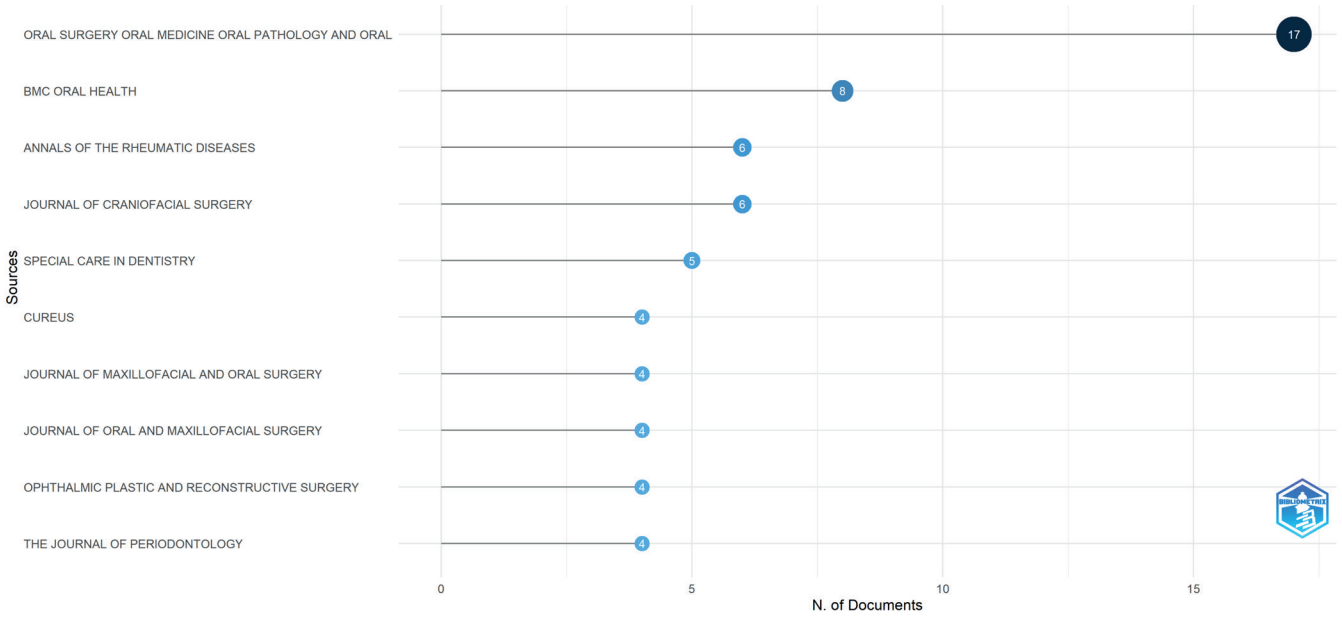

Figure 3: Most productive journals publishing research linking oral and ocular health.

Illustration Credit: Namrata Dagli.

Geographical Distribution of Research

The geographic distribution of publications in the field of oral-ocular health exhibits a pronounced concentration among a few countries (Figure 4). The United States leads with 44 documents, closely followed by India with 43, signifying nearly equal levels of activity between the two nations. Japan contributed 23 publications, then Italy with 18, Turkey with 16, and Brazil with 15, while Germany, Spain, and the United Kingdom each contributed between 8 and 9, and Australia contributed 7. This pattern reflects that approximately two-thirds of the output is accounted for by the top six countries (USA, India, Japan, Italy, Turkey, Brazil). However, this assessment is based on 299 of the 351 retrieved articles, as 14.81% of the affiliation's information was unavailable in the Biblioshiny dataset.

Trend Topic Analysis

Figure 5 illustrates the temporal evolution of key research terms derived from article titles, showing how the focus of research linking oral and ocular health has shifted over time. The title-based trend assessment shows that the *alveolar nerve* and *nerve block* have the highest frequency, with first-quartile years of 2011 and 2012, respectively, and third-quartile years extending to 2019 and 2021. Terms such as *tooth extraction*, *membrane pemphigoid*, and *mucous membrane* also show consistent representation over time. Most frequently used terms during 2006 to 2016 include *cicatricial pemphigoid*, *vision loss*, *local anesthesia, inferior alveolar, and dental extraction*. The most commonly used terms between 2017 and 2021 include *periodontal disease*, *diabetic retinopathy, transient diplopia, orbital cellulitis, Sturge-Weber syndrome, optic neuropathy, Sjögren's syndrome, Behçet's disease, membranous pemphigoid,* and *apex syndrome.* The terms that appeared during the last 3-4 years are *cavernous sinus, sinus thrombosis, pediatric patient, dental infection, and cohort study.*

Bibliographic Coupling of Documents

Bibliographic coupling refers to the degree to which two documents cite the same references; when articles draw upon a shared body of literature, they become linked through these common citations. This measure helps identify clusters of documents that rely on similar knowledge bases [18]. In the present analysis, of the 351 articles retrieved, 91 met the criterion of having at least 10 citations. For each of these 91 articles, the total strength of bibliographic coupling links with all other

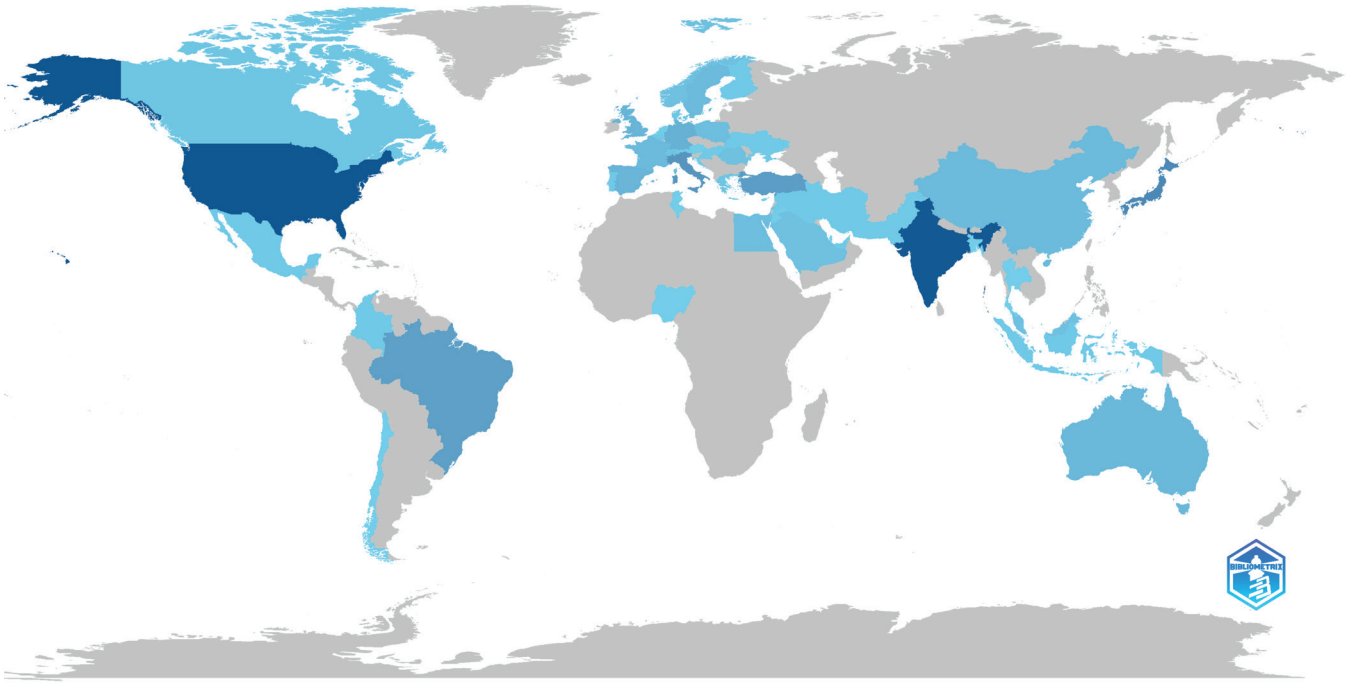

Figure 4: Geographical distribution of publications on oral and ocular health. The shade of blue represents publication output, with darker shades indicating higher output.
Illustration Credit: Namrata Dagli.

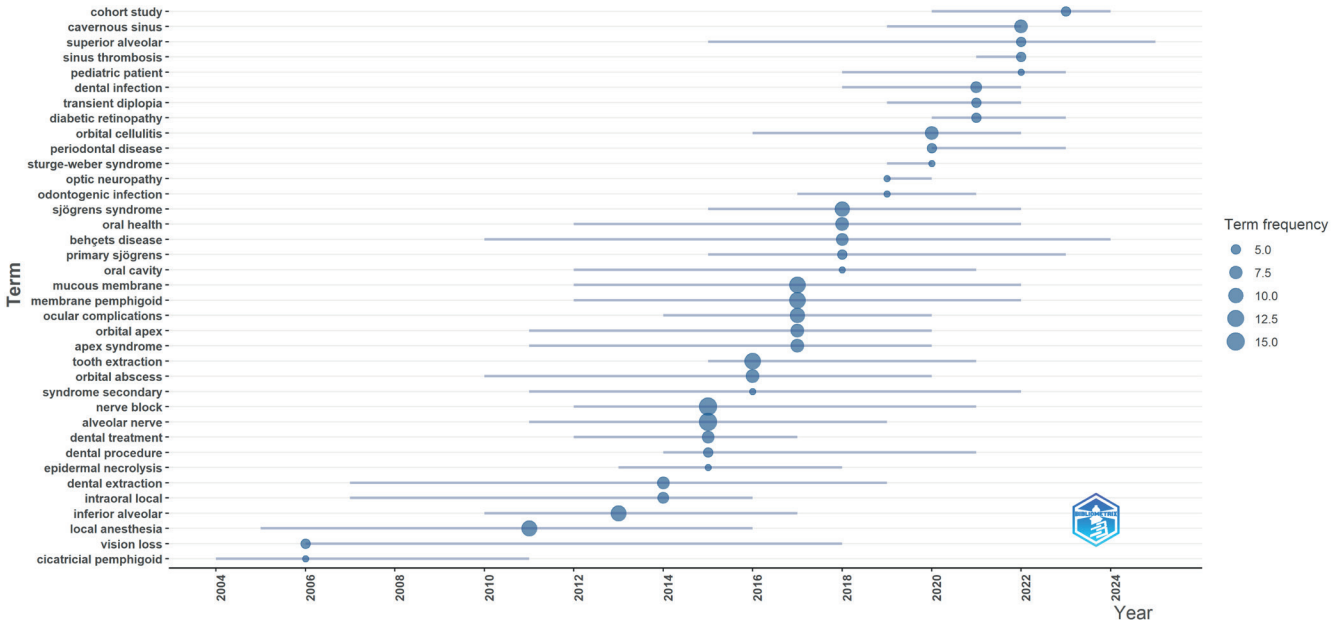

Figure 5: Trend topic analysis based on terms extracted from the title showing evolution of research focus in oral–ocular health from 2000 to 2025.
Illustration Credit: Namrata Dagli.

documents in the dataset was calculated, and network analysis was done using VOSviewer. The resulting network visualization (Figure 6) revealed the largest connected cluster, consisting of 12 items with 50 links and a link strength of 112, indicating that a subset of publications share overlapping reference foundations. All the 12 articles are mentioned in the Table 1. Within this interconnected group, the article by Williams JV et al (2020) [19] demonstrated the highest total link strength (40).

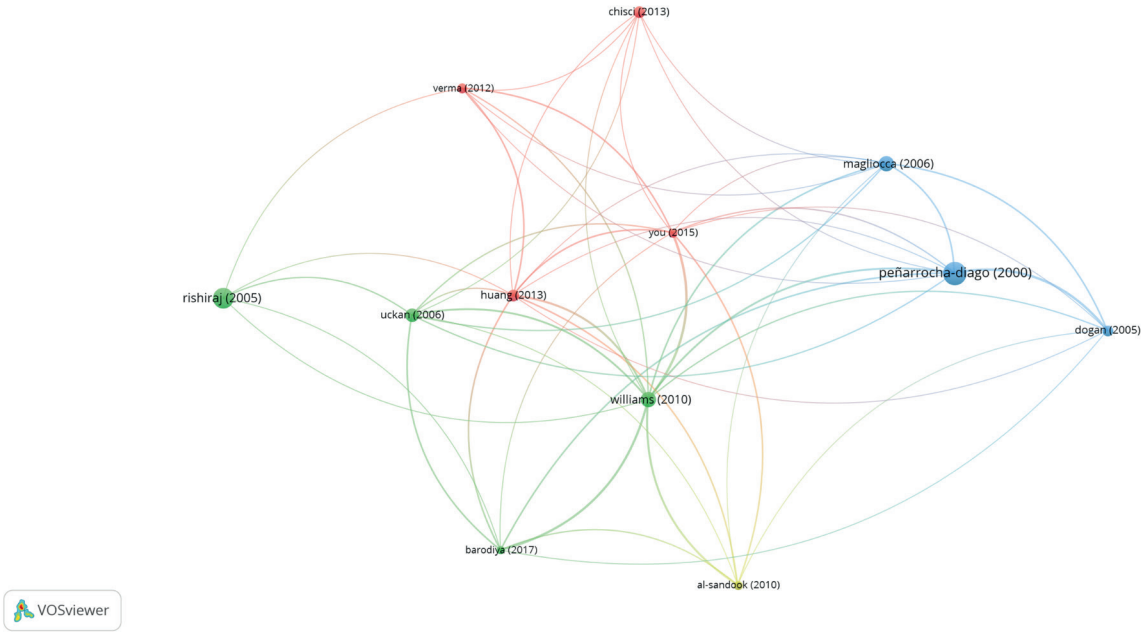

Figure 6: Bibliographic coupling network visualization of literature linking oral and ocular health.
Illustration Credit: Namrata Dagli.

Table 1: Articles Identified in Bibliographic Coupling Analysis in The Largest Set of Connected Items.

Clusters	Authors Details	Title of Article
Red Cluster	Chisci G et al. (2013) [20]	Ocular Complications After Posterior Superior Alveolar Nerve Block: A Case of Trochlear Nerve Palsy.
	Huang RY et al. (2013) [21]	Concomitant Horner and Harlequin Syndromes After Inferior Alveolar Nerve Block Anesthesia.
	Verma DK et al. (2012) [22]	Ipsilateral, Isolated Amaurosis After Inferior Alveolar Nerve Block: Report of Two Rare Cases.
	You TM (2015) [23]	Diplopia After Inferior Alveolar Nerve Block: Case Report and Related Physiology.
Green Cluster	Barodiya A et al. (2017) [24]	Temporary Blindness After Inferior Alveolar Nerve Block.
	Rishiraj B et al. (2005) [25]	Permanent Vision Loss In One Eye Following Administration of Local Anesthesia For A Dental Extraction.
	Uckan S et al. (2006) [26]	Rare Ocular And Cutaneous Complication Of Inferior Alveolar Nerve Block.
	Williams JV et al.(2010) [19]	Amaurosis, Ophthalmoplegia, Ptosis, Mydriasis, and Periorbital Branching Following Inferior Alveolar Nerve Anesthesia.
Blue Cluster	Dogan EA et al. (2005) [27]	Transient, Partial Ophthalmoplegia and Horner's Syndrome After Intraoral Local Anesthesia.
	Mangliocca KR et al. (2006) [28]	Transient Diplopia Following Maxillary Local Anesthetic Injection.
	Penarrocha-diago M et al. (2000) [29]	Ophthalmologic Complications After Intraoral Local Anesthesia With Articaine.
Yellow Cluster	Al-Sandook T et al. (2010) [30]	Ocular Complications After Inferior Alveolar Nerve Block: A Case Report.

Most Cited Articles

The most-cited studies in this field identify four major themes that link oral and ocular health. First, several high-impact publications—including Peñarrocha-Diago M et al.[29] (2000), Rishiraj B et al. [25] (2005), and Williams JV et al. [19] (2010)—describe rare but serious eye complications that occur after intraoral local anesthesia. In addition, Septa et al. [31] (2012) explained that orbital involvement is common in facial trauma and requires coordinated management among oral and maxillofacial surgeons and ophthalmologists. Second, the papers by Sultan et al. [32] (2017) and Carrozzo et al. [33] (2001) highlight autoimmune conditions such as mucous membrane pemphigoid and pemphigus vulgaris, which commonly present with lesions in both the mouth and the eyes and often require interdisciplinary care. Third, the studies by Ueta et al. [34] (2015) and Bequignon et al. [35] (2015) focus on Stevens–Johnson syndrome and toxic epidermal necrolysis, which typically involve severe inflammation of both oral and ocular mucosa and demand close monitoring by oral medicine and ophthalmology teams. Fourth, studies such as Chowanadisai et al. [36] (2000), Gijbels et al. [37](2005), and Yoshino et al. [38] (2018) emphasize occupational and procedural ocular risks in dentistry, including visual strain, blue-light exposure, and work-related eye complications, highlighting the importance of preventive measures and ocular safety in dental practice. The most cited ten articles are mentioned in the Table 2.

Table 2: Most Cited Articles linking Oral and Ocular Health.

Paper	Title	Total Citations (TC)	TC/ Year	Normalized TC
Chowanadisai S. et al. [36] 2000. Int Dent J. doi: 10.1111/J.1875-595x.2000.Tb00544.X	Occupational health problems of dentists in Southern Thailand.	144	5.54	4.16
Peñarrocha-Diago M. et al. [29], 2000. Oral Surg Oral Med Oral Pathol Oral Radiol. doi: 10.1067/Moe.2000.107506	Ophthalmologic complications after intraoral local anesthesia with articaine.	86	3.31	2.48
Rishiraj B. et al. [25] 2005. Int J Oral Maxillofac Surg. doi: 10.1016/J.Ijom.2004.04.010	Permanent vision loss in one eye following administration of local anesthesia for a dental extraction.	65	3.10	2.26
Gijbels F. et al. [37] 2005. Clin Oral Investig. doi: 10.1007/S00784-005-0003-6	Potential occupational health problems for dentists in Flanders, Belgium.	61	2.90	2.12
Septa D. et al. [31] 2012. J Maxillofac Oral Surg. doi: 10.1007/S12663-012-0452-9	Etiology, incidence, and patterns of mid-face fractures and associated ocular injuries.	58	4.14	2.88
Sultan A. et al. [32] 2017. Oral Dis. doi: 10.1111/Odi.12639	Oral mucous membrane pemphigoid and pemphigus vulgaris—a retrospective two-center cohort study.	58	6.44	3.85
Ueta M. et al. [34] 2015. J Allergy Clin Immunol. doi: 10.1016/J.Jaci.2014.12.1916	IKZF1, a new susceptibility gene for cold medicine–related Stevens-Johnson syndrome/toxic epidermal necrolysis with severe mucosal involvement.	58	5.27	4.63
Yoshino F. et al. [38] 2018. Jpn Dent Sci Rev. doi: 10.1016/J.Jdsr.2018.06.002	Effects of blue-light irradiation during dental treatment. Japanese Dental Science Review.	52	6.50	6.50
Bequignon E. et al. [35] 2015. JAMA Dermatol. doi: 10.1001/Jamadermatol.2014.4844	Stevens-Johnson syndrome and toxic epidermal necrolysis: ear, nose, and throat description at acute stage and after remission.	49	4.45	3.91
Carrozzo M. et al. [33] 2001. Br J Dermatol. doi: 10.1046/J.13652133.2001.04448.X	HLA-DQB1 alleles in Italian patients with mucous membrane pemphigoid predominantly affecting the oral cavity	45	1.80	4.09

DISCUSSION

These findings indicate that research connecting oral and ocular health remains an emerging but steadily expanding interdisciplinary area. The low annual growth rate and citation impact suggest that, while the field is gaining visibility, it has not yet achieved the extent of global integration or recognition of more established biomedical domains. The predominance of multi-authored papers underscores a collaborative approach. Nonetheless, the relatively low proportion of international collaborations signals a potential gap in global networking and knowledge exchange that could be strengthened through cross-regional partnerships. The exclusive representation of journal articles underscores that scholarly communication in this domain primarily relies on peer-reviewed dissemination, ensuring methodological rigor but possibly limiting interdisciplinary outreach.

The publication and citation pattern described an increase in document output after 2019, paired with fluctuating mean citations per article, with peaks around 2000 and 2005 and a decline post-2017. Persistently low annual citation rates suggest that the research area is growing in output but has not yet established a strong evidence base. Although publication volume has increased in recent years, the decline in mean citations per article indicates that many recent studies have not gained visibility. The low average citations per year also suggest that recent findings are circulating gradually across the research community. The field appears to be expanding in scope without a corresponding increase in influence, indicating the need for more foundational work, better dissemination of new evidence, and stronger linkages among studies to increase both citation performance and scholarly impact.

The journal productivity analysis indicates that while the topic of oral–ocular interrelations is gaining scholarly traction, it remains dispersed mainly across dental and allied medical journals rather than concentrated within a distinct interdisciplinary outlet. The dominance of *Oral Surgery, Oral Medicine, Oral Pathology, and Oral Radiology,* and *BMC Oral Health* underscores the clinical orientation of current research, where ocular manifestations are often explored as secondary outcomes of oral or systemic conditions. The appearance of papers in *Annals of the Rheumatic Diseases* indicates research on shared inflammatory and autoimmune mechanisms affecting both oral and ocular tissues (e.g., Dry Eye Syndrome and Sjögren's Syndrome). The relatively lower representation in ophthalmology journals suggests a research gap, indicating that dental rather than ocular science communities primarily drive collaborations. Overall, the journal distribution reflects an expanding yet still fragmented research landscape, indicating the need for stronger interdisciplinary collaboration and the establishment of dedicated publication avenues that integrate perspectives from dentistry, ophthalmology, and systemic disease research.

The distribution of research activity across countries suggests that work linking oral and ocular health is concentrated within a relatively small group of nations, indicating both regional research leadership and uneven global engagement. The near-equal contributions from the United States and India point to strong interest in this area from two very different research environments, which may reflect differing clinical priorities, population needs, and institutional capacities [39,40]. The presence of Japan, Italy, Turkey, and Brazil among the most productive countries shows that interest spans multiple continents. Yet, contributions from other regions appear limited, suggesting that global representation is still evolving. Because a few records lacked country information, the current pattern should be interpreted with some caution; nonetheless, the available data suggest that research activity is clustered and that opportunities exist to strengthen participation from under-represented countries to broaden the international evidence base.

The trend analysis of key terms drawn from article titles shows clear shifts in the focus of research and reveals three distinct phases in the development of the oral–ocular field. The initial phase was dominated by studies on procedure-related complications, particularly ocular effects following dental anesthesia. The second phase reflected a growing emphasis on systemic and immune-mediated disorders, such as mucous membrane pemphigoid, Sjögren's syndrome, and Behçet's disease, highlighting the shared inflammatory pathways between oral and ocular tissues. The most recent phase, emerging over the past three to four years, has focused on infectious and vascular conditions, including cavernous sinus thrombosis, and has incorporated pediatric cases and cohort-based investigations. This shift suggests a gradual expansion from case-based reports toward studies on shared disease mechanisms and systemic links. The most frequently used terms related to conditions presenting with both oral and ocular manifestations include Sturge–Weber syndrome, diabetes, Sjögren's syndrome, Behçet's disease, mucous membrane pemphigoid, orbital apex syndrome, and cavernous sinus thrombosis.

The bibliographic coupling pattern suggests that only a limited segment of the literature in this field shares a common set of foundational sources, indicating a

fragmented research landscape. The analysis presents the most extensive set of connected items, including research on links between oral procedures and ocular complications. The articles include case reports describing ocular complications after inferior alveolar nerve blocks [19,21-24,26,30], posterior superior nerve block [20,25,28,29,] such as amaurosis, diplopia, Horner's syndrome, Harlequin syndromes, temporary blindness, permanent visual loss, ophthalmoplegia, ptosis, mydriasis and periorbital branching, illustrating the heterogeneity of presentations and the emphasis on safety considerations in dental settings [19-30]. Together, these clusters reveal that the research landscape is anchored in case-based evidence, with sustained attention to neuro-ophthalmic outcomes that underscore the anatomical proximity between oral injection sites and orbital structures.

The most-cited work in this area centers on four interconnected clinical themes. One line of research examines ocular complications arising after dental anesthesia, underscoring shared anatomical pathways between oral and orbital structures. Another focuses on autoimmune disorders that simultaneously affect oral and ocular mucosa, indicating the need for coordinated care across specialties [41]. A third theme involves severe drug reactions, such as Stevens–Johnson syndrome, which often produce parallel injury in both tissues. A forth theme is related to ocular damage to dentists and patients during dental procedures. These patterns show that research attention focuses on well-defined clinical scenarios in which oral and ocular tissues are simultaneously affected, either due to dental procedures, immune-mediated disease, or severe drug reactions.

The comparison between bibliographic coupling results and the list of most-cited articles shows a clear difference between recent research links and long-standing scholarly influence. Bibliographic coupling links studies that share common references, pointing to active or emerging areas of investigation. In contrast, citation counts reflect papers that have gained long-term visibility and shaped the foundation of the field. The limited overlap between the two groups, with only two articles appearing in both, suggests that the most interconnected studies today are not necessarily the most historically cited. This pattern indicates an evolving research front that builds upon but also extends beyond earlier influential works.

Strengths and Limitations

This study offers a structured overview of research linking oral and ocular health over a span of more than two decades, using established bibliometric methods. It is the first bibliometric investigation explicitly dedicated

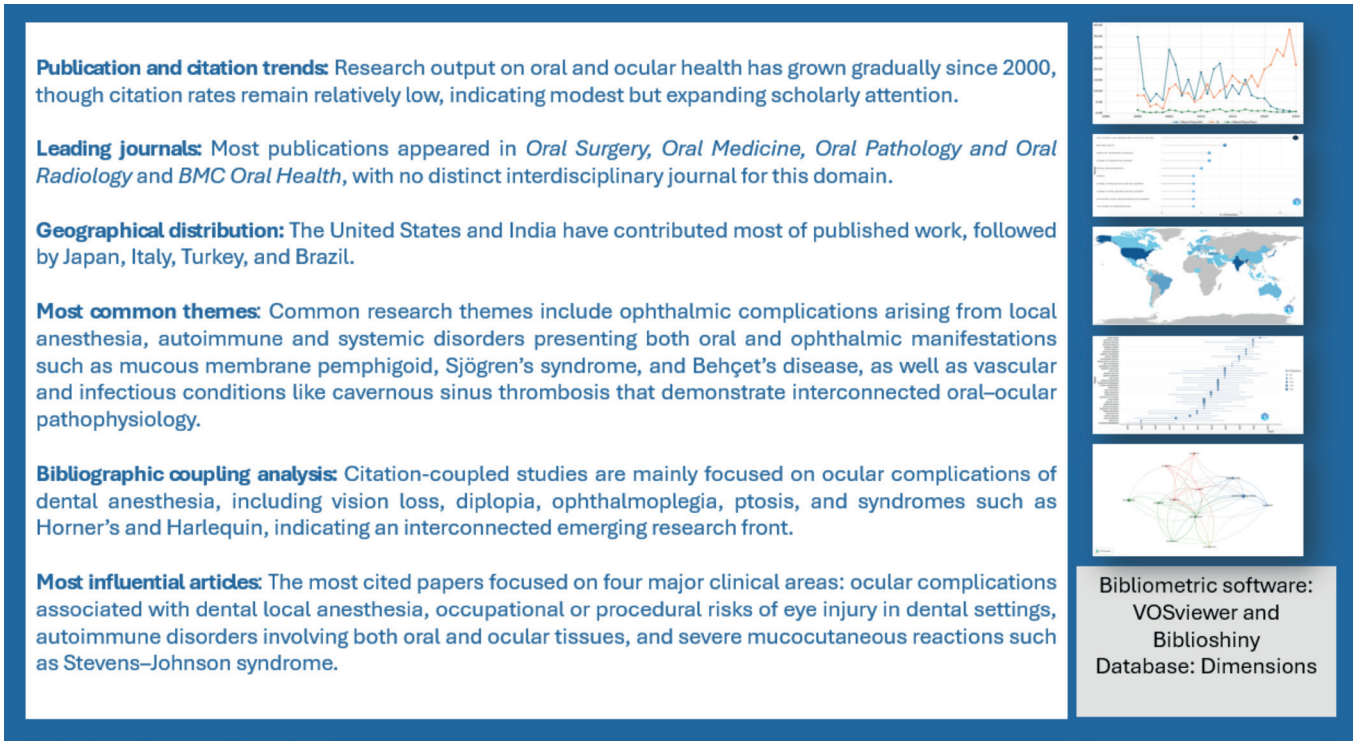

Figure 7: Key findings of the bibliometric analysis on literature linking oral and ocular health
Illustration credit: Namrata Dagli.

to this interdisciplinary topic, helping fill a clear gap in the current literature. The use of multiple analytical techniques, such as descriptive indicators, trend analysis, and network mapping, provides a broad and balanced view of how the field has developed. All the key findings of the study are summarized in Figure 7.

Despite providing valuable insights, several limitations must be considered. Additionally, reliance on a single database, Dimensions, may omit some indexed papers available exclusively in Scopus or Web of Science, though its broad coverage mitigates this limitation. The analysis depended on metadata completeness, and missing country or affiliation information in some records may reduce the accuracy of the geographical patterns. Citation-based indicators are also influenced by database coverage and citation behavior, so they may not fully reflect the scientific value of individual articles.

Future Study Recommendations

Future work in this area would benefit from more primary research to clarify the biological and clinical mechanisms that link oral and ocular conditions, as many of the existing publications rely on isolated case reports. Multicenter or population-based studies could help establish how common these overlaps truly are and identify groups at higher risk. Although our analysis did not identify this link within the included studies, a few external publications have suggested a possible connection between the oral microbiome and certain ocular conditions, including glaucoma, indicating an additional area that needs further exploration [42,43]. Collaboration between dental, ophthalmic, and immunology researchers could support more integrated models of prevention and management.

CONCLUSION

This bibliometric analysis provides a structured overview of research exploring the connection between oral and ocular health. The findings show a steady rise in publications over the years, peaking in 2024, although citation growth has been low. The journal productivity analysis indicates that while the topic of oral–ocular interrelations is gaining scholarly traction, it remains dispersed mainly across dental and allied medical journals rather than concentrated within a distinct interdisciplinary journal *Oral Surgery, Oral Medicine, Oral Pathology and Oral Radiology,* and *BMC Oral Health* have contributed most of the published work. The most cited papers primarily address ocular complications after dental local anaesthesia, occupational or procedural risk of ocular damage to dentists and dental patients, autoimmune mucosal diseases, and severe drug reactions involving both oral and ocular tissues. The United States and India are identified as the most productive countries. The evolving research focus illustrates a shift from procedural complications to systemic and immune-mediated disorders, and, more recently, to infectious and vascular conditions involving both the oral and ocular systems. The most frequently studied health conditions presenting with both oral and ocular manifestations include Sturge–Weber syndrome, diabetes, Sjögren's syndrome, Behçet's disease, mucous membrane pemphigoid, orbital apex syndrome, and cavernous sinus thrombosis. The focus of the largest group of connected articles, as identified through bibliographic coupling, is ocular complications of dental anesthesia, including conditions such as vision loss, diplopia, ophthalmoplegia, ptosis, and syndromes such as Horner's and Harlequin. The limited overlap between citation-coupled and highly cited studies indicates that contemporary research on oral and ocular health is distinct from the earlier foundational work in this field. Together, these findings suggest that the connection between oral and ocular health is a growing but underdeveloped research domain. Strengthening collaborations across dental, ophthalmic, and systemic health disciplines may help build a more cohesive evidence base and guide future clinical and translational research in this emerging domain.

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 member of the Bangladesh Journal of Medical Science. The rest of the 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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