



MAPPING OF INTEGRATED RESEARCH TRENDS IN ORAL AND GENERAL HEALTH: A BIBLIOMETRIC ANALYSIS

Dentistry

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ABSTRACT

Overall health cannot be achieved without prioritizing oral health. Integrated oral and general health research provides knowledge on the multiple factors relating to oral and general health. The aim was to investigate the trends in integrated research of various health disciplines with oral health, analyze research hotspots, major contributors and perform analysis to provide recommendations of emerging research foci in integration of oral health and general health. Using Pubmed database as the source, bibliometric analysis was performed to analyze publications between January 2015 to March 2024 pertaining to integration of oral and general health. Publication year, journals and keywords were analyzed. VOSviewer software and Microsoft Excel were used for analysis. Out of 1,931 articles retrieved, 321 were eligible for analysis. The publication trend showed a noticeable increase in the number of publications related to this topic of interest over the past decade. The highest contributors among dental and medical journals were BMC Oral health and International Journal of Environmental Research and Public Health with 46 and 36 publications respectively. Network analysis identified the most commonly occurring keywords like oral health, primary health care, health status, quality of life, pregnancy, periodontitis, diabetes mellitus, neoplasms, mental disorders, interprofessional relations etc. Psychometrics, neoplasms and aging are emerging foci of interdisciplinary research. In conclusion, there is an increase in integrated publications, reflecting a growing realization on the role of oral health in general health and shows an increase in interdisciplinary healthcare approach.

KEYWORDS

Bibliometrics, general health, oral health

INTRODUCTION

“Oral health is the state of the mouth, teeth and orofacial structures that enables individuals to perform essential functions such as eating, breathing and speaking, and involves psychosocial dimensions such as self-confidence, well-being and the ability to socialize and work without pain, discomfort and embarrassment.” Oral health is integral part of general health, supporting the individuals to participate in society and achieving their potential.^[1]

Oral and general health share a cluster of modifiable risk factors such as diet and smoking that contribute to oral and other non-communicable diseases together. Many oral health conditions not only affect the mouth but also manifest as systemic disorders, indicating a deep connection between oral health and overall well-being.^[2] The relationship between oral health and general health has gained significant research interest over the decades. Although a definitive causal relationship between various oral diseases and general health remains unconfirmed, the presence of comorbidities due to shared risk factors is widely accepted based on current evidence. This underscores the need for integrating oral health and general health policies, as well as health-promoting interventions, to enhance overall well-being. It is essential to consider oral health status, particularly among individuals with compromised medical conditions, to implement effective healthcare strategies.^[3]

A comprehensive understanding of the interplay between oral and general health is necessary for developing integrated health approaches. This understanding can be achieved through collaborative research that bridges the gap between oral and general health disciplines. By fostering interdisciplinary partnerships and shared knowledge, integrated health research can provide valuable insights into the connections between oral and general health, ultimately leading to more effective and holistic health interventions.

Bibliometric analysis primarily focuses on academic productivity by using published scientific literature to measure research activities in a specific area. It relies on data from journals, titles, authors, addresses, abstracts, and published literature references. It is also concerned with the quantitative analysis of citations, citation numbers, the significance of a research topic, and research undertaken in some geographic regions. These are now considered high-quality, reliable, and informative instruments. This analysis may not provide strong evidence related to a research question as from Meta-Analysis, but it provides a landscape of the problem and solutions discussed

worldwide in an area of interest.^[4] A bibliometric analysis on the topic of integrated oral and general health research may offer a comprehensive overview of prominent research trends and the landscape of published literature in this field. It can help in identifying key areas of focus and emerging themes.

Hence, this bibliometric analysis was conducted with an aim of identifying the trends and scope of interdisciplinary perspectives in oral health research. The objectives were to investigate the trends in integrated research of various health disciplines with oral health, analyze research hotspots, major contributors and perform analysis to provide recommendations of emerging research foci in integration of oral health and general health.

Methodology

This review followed the preliminary guidelines for reporting bibliometric reviews.^[5] A systematic search was conducted using PubMed database. The following search strategy was used (Figure:1). Original research publications from the period of January 2015 to March 2024 in English language were included.

Search: oral health AND general health AND integration

((("oral health"[MeSH Terms] OR ("oral"[All Fields] AND "health"[All Fields]) OR "oral health"[All Fields]) AND ("health status"[MeSH Terms] OR ("health"[All Fields] AND "status"[All Fields]) OR "health status"[All Fields] OR ("general"[All Fields] AND "health"[All Fields]) OR "general health"[All Fields]) AND ("integrability"[All Fields] OR "integrable"[All Fields] OR "integral"[All Fields] OR "integrally"[All Fields] OR "integrals"[All Fields] OR "integrant"[All Fields] OR "integrants"[All Fields] OR "integrate"[All Fields] OR "integrated"[All Fields] OR "integrates"[All Fields] OR "integrating"[All Fields] OR "integration"[All Fields] OR "integrational"[All Fields] OR "integrations"[All Fields] OR "integrative"[All Fields] OR "integratively"[All Fields] OR "integrator"[All Fields] OR "integrators"[All Fields])) AND (2015:2024[pdat])

Figure 1: Search strategy

This analysis was conducted on a single day to avoid potential bias from continuous database updates, ensuring consistent data of the search results. Ethical approval was not required as the search utilized a public database and did not involve any human subjects in this research.

The VOSviewer software (1.6.16) software was used to perform the data mapping. VOSviewer is a program for constructing and viewing bibliometric maps. It can be used to construct maps of authors or journals based on co-citation data or to construct maps of keywords based on co-occurrence data. The program offers a viewer that allows bibliometric maps to be examined in full detail. VOSviewer can display a map in various different ways, each emphasizing a different aspect of the map.^[6]

Microsoft Excel software^[7] was used to analyze the total number of publications each year and the productivity of various journals. The extraction of bibliometric data, analysis of co-occurrence of keywords and visualization of clusters was performed using VOSviewer.

RESULTS

Analysis of publication trends

Out of 1,931 articles retrieved, 321 were eligible for analysis. Figure 2 shows a consistent increase in publications. The peak of output occurred in 2021-2022 with 92 publications.

Journal-wise contribution

Figure 3 shows the top 10 journals, accounting for 12.58% of total publications, have significantly contributed to this body of research. BMC Oral health was the top contributor with 46 publications followed by International Journal of Environmental Research and Public Health (36 publications).

Co-occurrence of keywords

Keyword co-occurrence analysis assesses links between keywords and identifies hot topics in specific fields. Co-occurrence analysis was performed on frequently occurring keywords, identifying prominent research themes based on prevalent keyword associations. These keywords were analyzed using the co-occurrence network analysis tool in VOSviewer and a co-occurrence network map was generated (Figure 4). About 106 keywords were identified when a minimum threshold of 12 occurrence was set. Oral health, primary health care, health status, quality of life, pregnancy, periodontitis, diabetes mellitus and neoplasms appeared most frequently.

The map consists of seven keyword clusters with cluster 1 being the largest, consisting of 29 keywords. Clusters show a variety of study designs employed like experimental studies, cohort, case-control studies, cross-sectional, longitudinal and prospective studies, investigating numerous aspects of both oral and general health. Studies exploring specific oral conditions (e.g., dental caries, periodontal diseases) and systemic factors (e.g., diabetes mellitus, obesity), uncovering their relationships, prevalence, and interventions have been found. Additionally, genetic and behavioral influences bridging oral and general health domains have been explored. Most of this research has been conducted in countries like United States, England, Germany, Australia and France.

Figure 5 shows the overlay analysis of shifting trends over the last 10 years. Aging, neoplasms, HIV infections, stomatitis, mental health and prenatal care are the newer blooming themes in the field of integrated research.

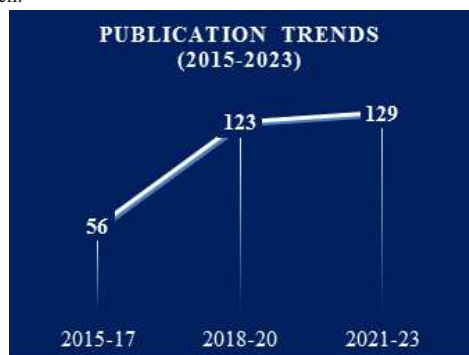


Figure 2: Publication trends from 2015-2023

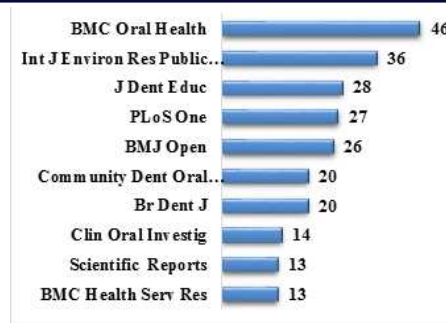


Figure 3: Top 10 Journals based on number of publications

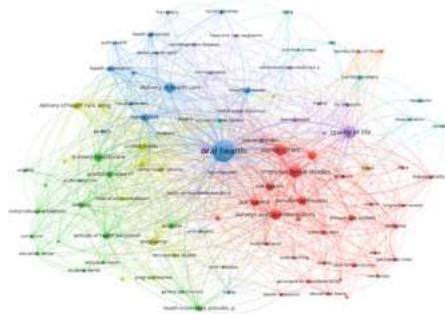


Figure 4: Network visualization of keyword co-occurrence



Figure 5: Overlay visualizations of research trends over time

DISCUSSION

Bibliometric analysis holds substantial value in scientific research. By systematically evaluating publication trends, researchers gain insights into the evolution of specific fields. Therefore, Bibliometrics facilitates the identification of classic work, emerging trends, collaboration dynamics, and gaps in research.^[8]

This study employed bibliometric analysis to map original research articles on integrated oral and general health perspectives across 2015 to 2024. A consistent increase in publications over the past 10 years was observed. This could be due to the recognition of the importance of addressing the interplay between oral and systemic health for comprehensive healthcare. Network mapping of the bibliometric data showed the relationships between the publication keywords. These maps illustrate the latest evidence and trends in the topic of oral and general health over the past decade. They spotlight current research areas and emerging trends that hold potential for public health impact.

This bibliometric analysis identifies emerging areas of interest in integrated oral and general health. These could be research foci in the future research. This may help in enabling public health policy developments targeting both oral and general health. Fostering interdisciplinary collaboration and promoting holistic approaches to public health challenges.

To the best of our knowledge this is the first bibliometric analysis reviewing the topic of integrated oral and general health research. The review provides a holistic view on the research trends of oral and general health. However, there are a few limitations like the search was

restricted to PubMed database resulting in partial representation of the entire body of literature. Excluding publications that are not indexed in this database could have led to selection bias. Including only English-language papers may have excluded valuable contributions in other languages.

Setting the keyword occurrence threshold at 12 or above for mapping might exclude potentially relevant studies with lower occurrences but with significant contributions or those with unique topics having the potential to gain significant citations in the future. Hence, the currently used threshold may overlook emerging research areas. However, this cut-off was selected with the anticipation of a higher chance of observing meaningful associations between different studies.

Recommendations: A broader approach to include other databases for a thorough analysis of integrated oral and general health research trends. There is a need to encourage more journals to publish on oral-systemic health topics to increase the diversity of research and reach a broader audience. The emerging themes highlight the need for interdisciplinary approaches. Further research should bridge oral health with broader medical fields, encouraging collaboration between dentists, medical professionals and public health experts. Future investigations on the scope of collaboration across different disciplines and geographic locations could help foster knowledge exchange.

CONCLUSION:

The study performed a bibliometric analysis on the trends and scope of interdisciplinary perspectives in oral and general health research. There is an increasing trend in this field of research. BMC Oral Health and International Journal of Environmental Research and Public Health emerged as the highest contributors. The analysis highlights shifting research trends over the last decade. Aging, neoplasms, HIV infections, stomatitis, mental health and prenatal care are potential research foci in the future. Thus, this bibliometric analysis can play a vital role in guiding research priorities, informing policy decisions, promoting interdisciplinary collaboration, and ultimately improving overall health outcomes.

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