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ORIGINAL ARTICLE

Bibliometric Analysis of Oral Health and Oral Care in Nursing by Visual Mapping Method (1981-2023)

Hemşirelik Alanında Ağız Sağlığı ve Ağız Bakımı ile İlgili Araştırmaların Görsel Haritalama Yöntemiyle Bibliyometrik Analizi (1981-2023)

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Abstract

Objective: This study aimed to identify scientific literature on oral care and oral health by analyzing the bibliometric characteristics of studies on oral care and oral health in the field of nursing.

Method: The research is a descriptive and retrospective study. Research data were obtained from the Web of Sciences Core Collection database on February 12, 2024. The keywords "oral care", "mouth care", "oral health", or "oral hygiene" were searched. We analyzed 733 research articles that met the inclusion criteria. The science mapping and bibliometric analyses were performed using the "VOSviewer" software.

Results: The first article in this field was written by Reidun Daeffler in 1981. The most commonly used keywords in the field were "oral health", "oral care" and "nursing". The total number of citations was 9,446 and the average number of citations per article was 12.89.

Conclusion: The popular research areas and topics of the scientific literature on oral care and oral health in nursing. The results of the bibliometric analysis showed that the interest in oral health and oral care in the field of nursing has increased in recent years.

Keywords: Bibliometric analysis, oral care, oral health, nursing care

Öz

Amaç: Bu araştırma, hemşirelik alanında ağız bakımı ve ağız sağlığı ile ilgili yapılan araştırmaların bibliyometrik özelliklerini analiz ederek konuyla ilgili bilimsel literatürü ortaya koymak amacıyla yapıldı.

Yöntem: Bu araştırma, tanımlayıcı ve retrospektif bir çalışmadır. Araştırma verileri 12 Şubat 2024 tarihinde "Web of Sciences Core Collection" veri tabanından elde edildi. Araştırmada "oral care" or "mouth care" or "oral health" or "oral hygiene" anahtar kelimeleri ile arama yapıldı. Dahil edilme kriterlerini karşılayan 733 araştırma makalesi analiz edildi. Araştırmanın bilim haritalaması ve bibliyometrik analizleri, "VOSviewer" yazılım programı kullanılarak yapıldı.

Bulgular: Bu alanda ilk makale 1981 yılında Reidun Daeffler tarafından yazılmıştır. Alanda en çok kullanılan anahtar kelimeler "oral health", "oral care" ve "nursing" olmuştur. Yayınların toplam atıf sayısı 9.446, makale başına ortalama atıf sayısı ise 12,89 olarak belirlendi.

Sonuç: Bu araştırma, hemşirelik alanında ağız bakımı ve ağız sağlığıyla ilgili yapılmış bilimsel literatüre ilişkin popüler araştırma alanlarını ve konularını göstermektedir. Bibliyometrik analiz sonucunda hemşirelik alanında ağız sağlığı ve ağız bakımına olan ilgilin son yıllarda arttığı belirlendi.

Anahtar Kelimeler: Bibliyometrik analiz, ağız bakımı, ağız sağlığı, hemşirelik bakımı

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Introduction

Oral health is defined as the absence of lesions or pain in the mouth, as well as a comfortable and functional oral structure that allows individuals to maintain their desired social role (1). Oral health and hygiene are known to be associated with general health, comfort, and well-being and to influence quality of life and overall well-being (1,2). The mouth is affected by various pathologies, such as periodontitis, gingivitis, and dental caries, which have a high prevalence in humans and are associated with changes in the oral microbiome. The site is also an important site for the development of other systemic diseases because it is the gateway to respiratory and digestive systems (3). Poor oral health is associated with impaired oral functions, such as speaking, chewing, and swallowing, malnutrition, dehydration, and pneumonia, as well as joint infections, atherosclerosis, cardiovascular disease, and poor glycemic control (4-6). In other words, poor oral health leads to a decrease in health-related quality of life, an increase in healthcare expenditures, and an increase in morbidity and mortality rates because it causes some non-communicable diseases. For all these reasons, oral hygiene and oral care are important parameters related to the reduction of disease risks and are important care practices that should be paid special attention to in all age groups (7,8).

Oral care is a complex set of practices that includes individualized care, such as assessing the oral cavity, reducing microorganisms in saliva, breaking down plaque, cleaning the inside of the mouth to prevent plaque-related diseases, maintaining oral hygiene, and maintaining psychological well-being (9,10). The primary goals of oral care are to maintain moisture, reduce microbial colonization in the mouth, and protect oral health (7,9,11,12). Oral care is an important part of nursing care and is one of the most important practices that affect the overall health and comfort of patients in all care settings (13,14). Many studies in different patient populations have shown that oral care practices provided by nurses are effective in preventing dry mouth, reducing ventilator-associated pneumonia, and protecting and improving oral health (7,12,15,16).

Bibliometrics is a research method that allows the identification and selection of studies on a topic. Although there are a limited number of bibliometric studies on oral care in the literature, the existing studies cannot reveal the global trends of studies on oral care and oral health practices in nursing practice in a comprehensive and detailed manner (17,18). Therefore, this study was conducted to analyze the bibliometric characteristics of studies on oral care and oral health in nursing to reflect the existing evidence, understand the research gaps, and guide future studies.

Main Points

- Oral care practices applied by nurses to patients are among the most important interventions for maintaining oral health and hygiene, providing comfort and well-being, and improving quality of life.
- Therefore, bibliometric and trend analyses of studies on oral care and health in nursing are of great importance for future research.

Material and Method

Research Questions

This study sought to answer the following questions:

1-What is the distribution of publications by years?

2-What is the impact of the included studies on the literature (total number of citations and h-index)?

3-Who are the leading authors, journals, countries, and institutions according to the number of publications and citations?

4-What are the collaborations between countries and institutions?

5-What are the trends in keywords and topics in the articles included in this study?

Design, Data Collection, and Sample Collection

This research is a descriptive and retrospective study. In this study, bibliometric data analysis was used to achieve the research objective and answer the research questions. The bibliometric analysis method is used to reveal emerging trends in article and journal performance, patterns of collaboration, and research components, and to explore the study structure of a particular field in the existing literature (19). It also evaluates the productivity of authors, countries, institutions, journals, and international collaborations. The most commonly used databases for bibliometric analysis are Web of Sciences (WoS), PubMed, Embase, Scopus, SpringerLink, Google Scholar, and ScienceDirect. These databases have different features. The WoS is a bibliographic database that shows the impact of scientific journals in different disciplines, the number of citations received by published articles, the lists of authors' articles, and the references of articles. The dataset used in this study was obtained from the WoS database because it is comprehensive and up-to-date in the field of health sciences and is highly preferred by researchers. The research data were obtained by searching the WoS Core Collection (WoSCC) database on February 12, 2024 using the keywords "oral care", "mouth care", "oral health", or "oral hygiene". The keyword search yielded a total of 449,441 studies in all categories in the WoS database. Articles published in the nursing category (n=766) and in English from 1981 to 2023 comprised the study sample (n=733). After screening using keywords and restrictions, WoS publications were distributed as articles (n=733), review articles (n=79), editorial material (n=37), meeting abstracts (n=36), early access (n=12), proceedings papers (n=8), letters (n=12), book reviews (n=2), book chapters (n=2), news items (n=1), and corrections (n=1). The database included in the bibliometric analysis was downloaded to the researcher's personal computer as a file with the .txt extension.

Statistical Analysis

Descriptive and bibliometric data analysis was conducted in this study. Descriptive data (distribution of publications by years, author with the most publications, country, institution, most cited publications, and journals) were tabulated using WoSCC. VOSviewer (Version 1.6.20, Center for Science and Technology Studies of Leiden University) software was used to create network maps and visualize the literature in the bibliometric analysis. "VOSviewer", an important bibliometric mapping application, is very useful for the analysis of large-scale data. Bibliometric analysis included citation analysis, coauthor analysis, common word analysis, bibliographic matching, country, institution, and author collaboration.

In bibliometric mapping, each item is represented as a circle, and the higher the activity of an item, the larger the circle. The colors of the circles are associated with the clusters to which the items belong. The lines represent the connections between elements. A short distance or proximity between items emphasizes the strength of the relationship between them (20).

Ethical Considerations

This was a retrospective review of studies published in WoS, and ethics committee approval was not required. The study adhered to the tenets of the Declaration of Helsinki.

Results

Distribution Characteristics of Relevant Literature

The first research on oral health and care in nursing was published in 1981 by Reidun Daeffler in the journal "Cancer Nursing" in the article titled "Oral hygiene measures for patients with cancer. III" by Reidun Daeffler in 1981.

The most articles in the field were published in 2019 (n=64 articles), second in 2023 (n=63 articles) and third in 2020 (n=55 articles) (Figure 1).

"Journal of Clinical Nursing" (47 articles, 837 citations, 217 total links strength), "Geriatric Nursing" (29 articles, 393 citations, 90 total link strengths) and "Australian Journal of Rural Health" (25 articles, 184 citations, 3 total link strengths) were the journals that published the most articles on oral health and oral care in the field of nursing (Table 1).

It was determined that the author who contributed the most to the field was "Ajesh George" (n=18 articles, 347 citations, 300 total link strengths), the country with the most publications was the USA (n=272 articles, 4302 citations, 681 total link strengths), and the institution with the most publications was "The University of Sydney" (26 articles, 359 citations, 289 total link strengths) (Tables 1,2).

Citation Analysis (Journal, Author, Article, and Country)

Citation network analysis counts direct citations from one document to another. The strength of the citation network increases as the number of citations increases. The first citation in the field was in 1986 (3 citations). If the number of citations of the articles is analyzed by years, the highest number of citations in the field was made in 2021 (1039 citations), second in 2022 (1005 citations), and third in 2023 (1001 citations). The total number of citations of the articles included in the bibliometric analysis was 9,446, the average number of citations per article was 12.89, and the H-index was 44 (Figure 1).

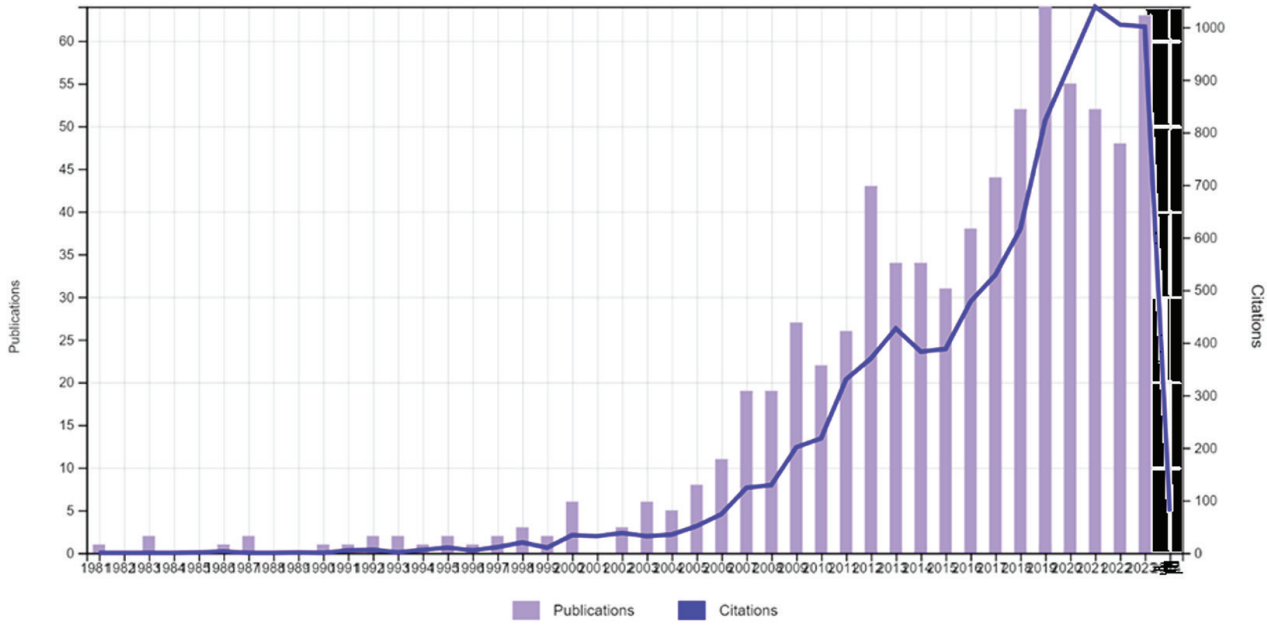

Figure 1.
Number of publications and citations by years (1981-2023)

Table 1.
Top 10 Authors, Countries, Institutions, and Journals

Author	Article count	Institution	Article count	Country	Article count	Journal	Article count
Ajesh George	18	University of Sydney	26	USA	272	Journal of Clinical Nursing	47
Shilpi Ajwani	11	New York University	24	Australia	87	Geriatric Nursing	29
Sameer Bhole	11	Virginia Commonwealth University	14	Brazil	49	Australian Journal of Rural Health	25
Mary Jo Grap: The Official Website	11	Western Sydney University	13	Sweden	43	American Journal of Critical Care	23
Cindy Munro	10	University of North Carolina	12	Türkiye	39	Journal of Advanced Nursing	22
Rita Jablonski	10	Karolinska Institu	11	England	37	Public Health Nursing	16
Anthony Blinkhorn	8	National Taiwan University	11	Taiwan	32	Journal of Gerontological Nursing	16
Maree Johnson	7	University Tasmania	10	South Korea	28	Scandinavian Journal of Caring Sciences	16
Mary Lou Sole,	7	Chang Gung University, Science and Technology	10	Canada	23	Cancer Nursing	15
Mei-Yen Chen	7	Chang Gung University	10	People's Republic of China	23	Intensive and Critical Care Nursing	14

When the journal and citation analysis was performed by limiting the number of journals publishing more articles in the field to a minimum of two publications and two citations, 107 journals were identified. The total number of journals that met the thresholds was 144. After this analysis, the most cited journal in the field of nursing related to oral health and oral care was the "American Journal of Critical Care" (235 articles, 1171 citations, 534 total link strengths). The second most cited journal was the "Journal of Clinical Nursing" (837 citations, total link strengths), and the third most cited journal was the "Journal of Advanced Nursing" (568 citations, 176 total link strengths) (Table 2, Figure 2).

The article "Oral Health and Care in the Intensive Care Unit: State of the Science" by Munro and Grap (21), published in Chest in 2009, was the most cited article in the field, with 146 citations. The article "Chlorhexidine, tooth brushing, and preventing ventilator-associated pneumonia in critically ill adults" published by Munro et al. (22) in the "American Journal of Critical Care" was the second most cited article with 136 citations. The article "Oral Care Interventions in Critical Care: frequency and documentation" by Grap et al. (23) in the "American Journal of Critical Care" was the third most cited article with 115 citations (Table 2).

When the citation analysis of publications related to oral health and oral care in the field of nursing was limited to at least two publications per author and at least two citations per publication, 1841 authors exceeded the threshold. The total number of authors who satisfied the thresholds was 16,367. The most cited author was "Grap Mary Jo" (11 articles, 645 citations, 42 total link strenghs), followed by "Cindy L. Munro" (10 articles, 612 citations, 24 total link strengths), and the third was "George Ajesh" (18 articles, 347 citations, 300 total link strengths) (Figure 3a).

Co-author Analysis (Author, Institute, Country)

Using the minimum number of publications and citations per author, the number of authors meeting the thresholds was 2721. When the threshold per author was limited to two publications and two citations, a total of 283 authors were identified. The author with the highest number of co-authored articles in the field was "George Ajesh" (18 articles, 347 citations, 20 links, 82 total link strengths), followed by "Ajwani Shilpi" (11 articles, 306 citations, 18 links, 63 total link strengths), and "Bhole Sameer" (11 articles, 306 citations, 18 links, 63 total link strengths) (Table 1, Figure 3a).

In the analysis of collaboration between co-authors and institutions, the total number of institutions that met the thresholds and collaborated was 1099. When the threshold per institution was limited to at least two publications and two citations, the total number of collaborating institutions was 234. According to the bibliometric analysis, the most collaborating institution was "The University of Sydney" (26 articles, 359 citations, 77 total link strengths), the second

Table 2.
The Top 10 Most Cited Artciles and Journals

Article	Author-year	Total citations	Journal	Total citations
Oral health and care in intensive care: state of the science	Munro and Grap, (2004)	146	American Journal of Critical Care	1171
Chlorhexidine, toothbrushing, and ventilator-associated pneumonia prevention in critically ill adults	Munro et al., (2009)	136	Journal of Clinical Nursing	837
Oral care interventions in critical care: frequency and documentation	Grap et al. (2003)	115	Journal of Advanced Nursing	568
Qualified nurses lack adequate knowledge about oral health, resulting in inadequate oral care for patients in medical wards.	Adams, R. (1996)	111	Geriatric Nursing	393
Oral health care: a low priority in nursing: in-depth interviews with nursing staff	Wårdh et al., (2000)	102	Cancer Nursing	392
Nurses' implementation of guidelines for ventilator-associated pneumonia from centers for disease control and prevention	Cason et al. (2007)	92	Scandinavian Journal of Caring Sciences	341
Oral health status and development of ventilator-associated pneumonia: a descriptive study	Munro et al. (2006)	80	International Journal of Nursing Studies	267
Assessment, management, and prevention of early childhood caries	Kagihara et al., (2009)	78	Intensive and Critical Care Nursing	226
Dysphagia and aspiration pneumonia in older adults	Eisenstadt, E. S. (2010)	76	The American Journal of Maternal and Child Nursing	195
Basic nursing care for nonventilatory hospital-acquired pneumonia	Quinn et al. (2014)	75	Journal of Neuroscience Nursing	188

was "Western Sydney University" (13 articles, 124 citations, 53 total link strengths), and the third was "South Western Sydney Local Health District" (10 articles, 104 citations, 43 total link strengths) (Figure 3b).

In the coauthor-country collaboration analysis, the total number of countries that met the thresholds and collaborated was 52. According to the co-author country analysis, the most collaborating country was the "USA" (272 articles, 4302 citations, 41 total link strengths), followed by the "UK" (37 articles, 476 citations, 29 total link strengths), and "Australia" (87 articles, 1083 citations, 25 total link strengths) (Figure 3c).

Bibliographic Coupling Analysis

Documents identified in the reference lists as referring to one or more common sources are called bibliographically matched documents (24). The total number of documents that met the thresholds in the bibliographic match analysis was 733. When the thresholds were limited to 2 citations per document, the number of publications was determined to be 568. According to the bibliographic matching analysis of the documents, the citation links between Munro and Grap (21), Munro et al. (22), and Grap et al. (23) are high (Figure 4).

Keyword Analysis

Figure 5 shows a visual network map of the relationship between common words used in the publications included in the analysis. In the figure, the size of the circle represents the most studied topic, while the yellow regions represent more recent topics. According to this analysis, 1451 keywords were identified in articles published in this field. According to the common keyword network analysis, the most frequently used keyword is "oral health" (203 occurrences, 217 links, 547 total link strengths), followed by "oral care" (111 occurrences, 142 links, 337 total link strengths), and "nursing" (79 occurrences, 139 links, 283 total link strengths).

Other frequently used keywords in the keyword analysis were "oral hygiene" (64 occurrences, 176 total link strengths), "ventilator-associated pneumonia" (36 occurences, 109 total link strengths), "nursing care" (31 occurrences, 79 total link strengths), "pregnancy" (26 occurrences, 86 total link strengths) and "older people" (32 occurrences, 86 total link strengths) (Figure 5).

Discussion

In this study, the status, development, and trends of oral health and oral care were examined by analyzing English-

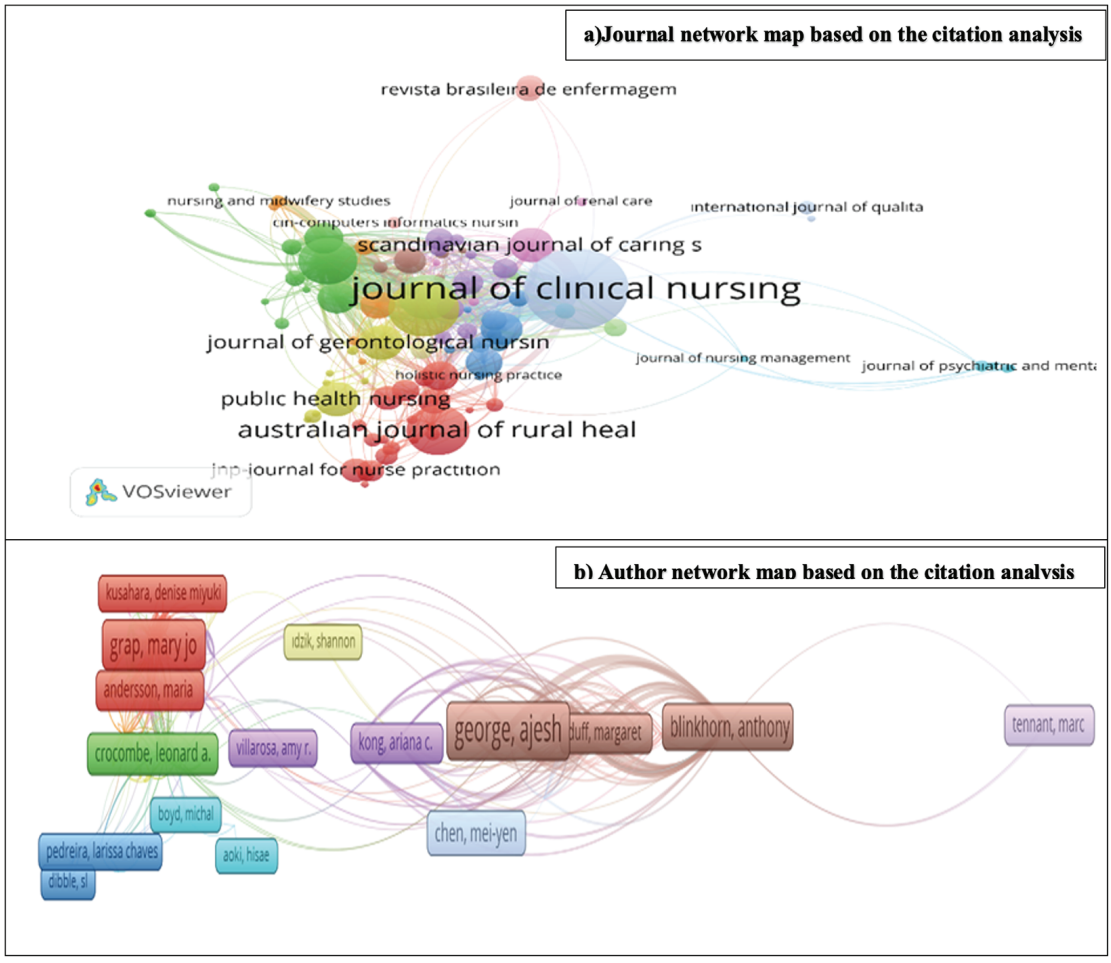

Figure 2.
Authors and journal network maps based on citation analysis

language nursing articles published in the "WoS database" in the area of oral health and oral care between 1981 and 2023. This study provides a retrospective perspective on scientific articles on oral health and oral care in nursing. According to the results of this bibliometric analysis, most studies on oral health and oral care in nursing were published under the title "articles". The first research in this field was published by Reidun Daeffler in 1981, and the number of articles has gradually increased since 1997 and reached a peak in 2021. In 1981, when the first article was published, only three articles were published. From 1981 to 1991, the number of published articles did not exceed one digit. The number of published articles increased rapidly after 2000 and peaked in 2021. From 1981, when the first research article was published, to 2000, a total of 163 articles were published and 370 citations were made. In 2023, the peak year for published articles and citations, a total of 374 articles were published, and 6444 citations were generated. This result shows that articles published in recent years on oral health and oral care in nursing have greatly attracted readers' attention and have had a significant impact on scientific studies. In addition, it is believed that the introduction and more frequent use of the Internet and the online environment in these years has significantly increased the number of studies.

Analyzing the countries, authors, and journals that produce the most scientific articles on the topic provides information about their productivity. The author, journal, institution, and country with the most relevant articles are considered the most productive in the field. In this study, the journal that published the most articles on the topic was "Journal of Clinical Nursing", the country was the United States, and the institution was "The University of Sydney". In addition, in the co-author analysis, the country with the highest number of collaborations was America, followed by "England, Australia, and Canada". This result will help researchers choose appropriate journals to publish their studies and appropriate countries to collaborate with and access information about the studies. The fact that the United States has the highest number of publications and collaborations may be related to its size, the number of universities and authors, and its academic health system. Similar to the results of this study, many bibliometric analysis studies conducted on different topics in nursing have shown that the country with the highest number of scientific publications is the "USA".

Citation network mapping is a technique used to identify seminal research and the dissemination of an idea that has developed in a particular field or topic over a period of

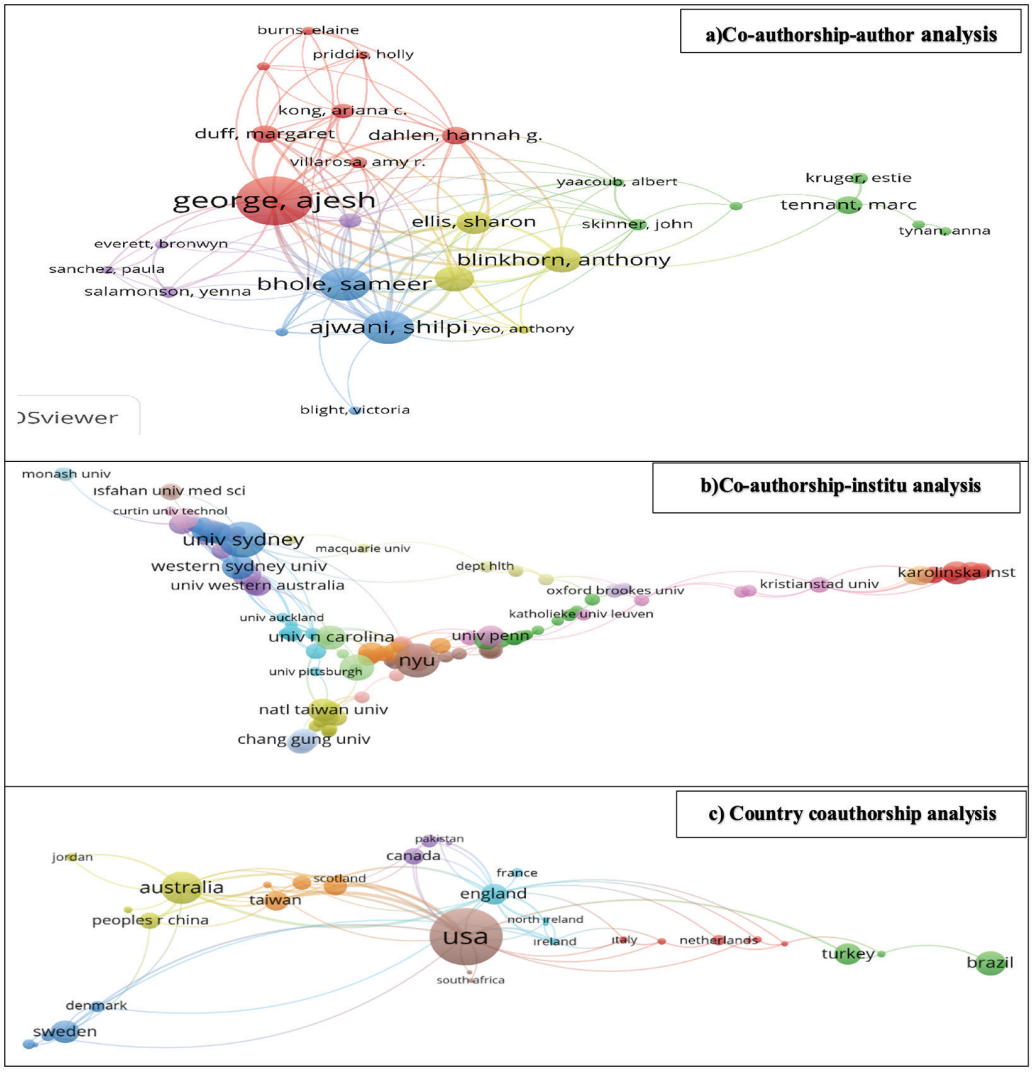

Figure 3.
Co-author-author, institution, and country analysis network map

time (24,25). In this bibliometric analysis, a review article on oral care and oral health in intensive care units written by Munro and Grap (21) was the most cited article in the field. We believe that this article is the most influential on oral care and oral health in nursing. Patients hospitalized in intensive care units are at high risk of developing systemic infections, such as poor oral health, dental plaque, oral infections, and ventilator-associated pneumonia (26). For this reason, many studies have been conducted on intensive care unit (ICU) patients, who represent the oral health risk group, to evaluate oral care practices and outcomes. This result demonstrates that research on oral care among patients hospitalized in intensive care units is a subject of interest and should be more scrutinized by the authors. The second most cited study revealed that providing oral care with a 0.12% chlorhexidine solution to adult patients in intensive care units helped prevent ventilator-associated pneumonia (22). Many studies have investigated which oral care solution is more effective in preventing ventilator-associated pneumonia, and while numerous studies have shown that chlorhexidine solutions between 0.12% and 0.2% are effective (27-30), there is less support in the literature for its role in preventing and managing periodontitis, dental caries, and the aerosolization of viruses (31). Recent guidelines do not recommend routine use of chlorhexidine gluconate for oral care in all patients on mechanical ventilation (32-34). Ventilator-associated pneumonia is particularly common in intensive care patients and is one of the leading causes of infection-related deaths (35). As a result, research on ventilator-associated pneumonia and its prevention has attracted significant interest from researchers in the field and is a subject of frequent study. The third most cited study in this field was a descriptive study aimed at determining the frequency of oral care interventions reported by nurses in various intensive care units. Despite evidence showing that sponge swabs are ineffective in removing plaque, they continue to be used for oral care, particularly in intubated patients in intensive care units. Additionally, although nurses reported performing oral care practices very frequently, the study revealed that very few of these practices were documented (23). From these results, we can conclude that in the field of nursing,

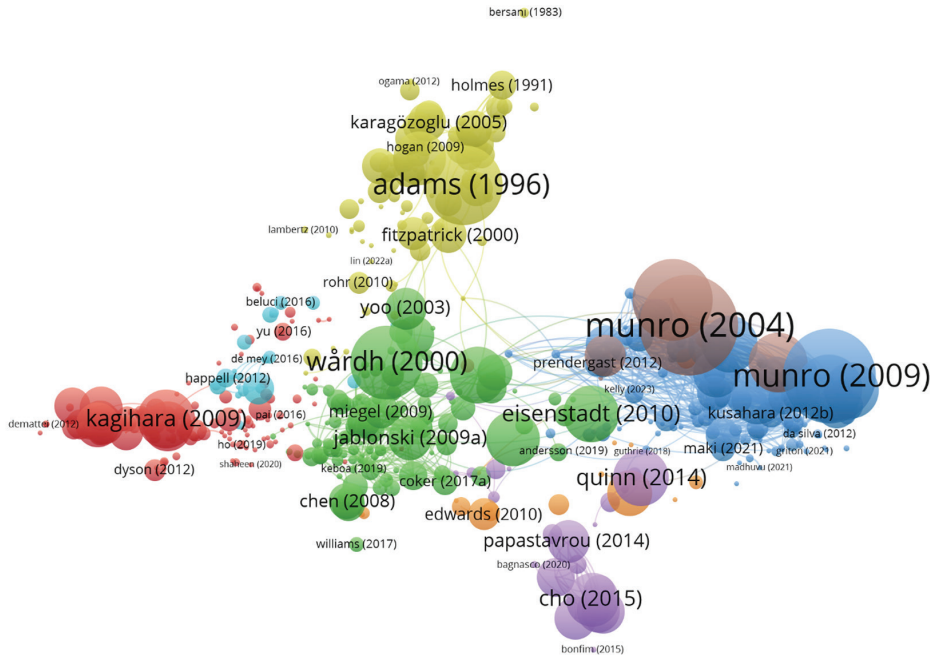

Figure 4.
Bibliographic coupling map of documents

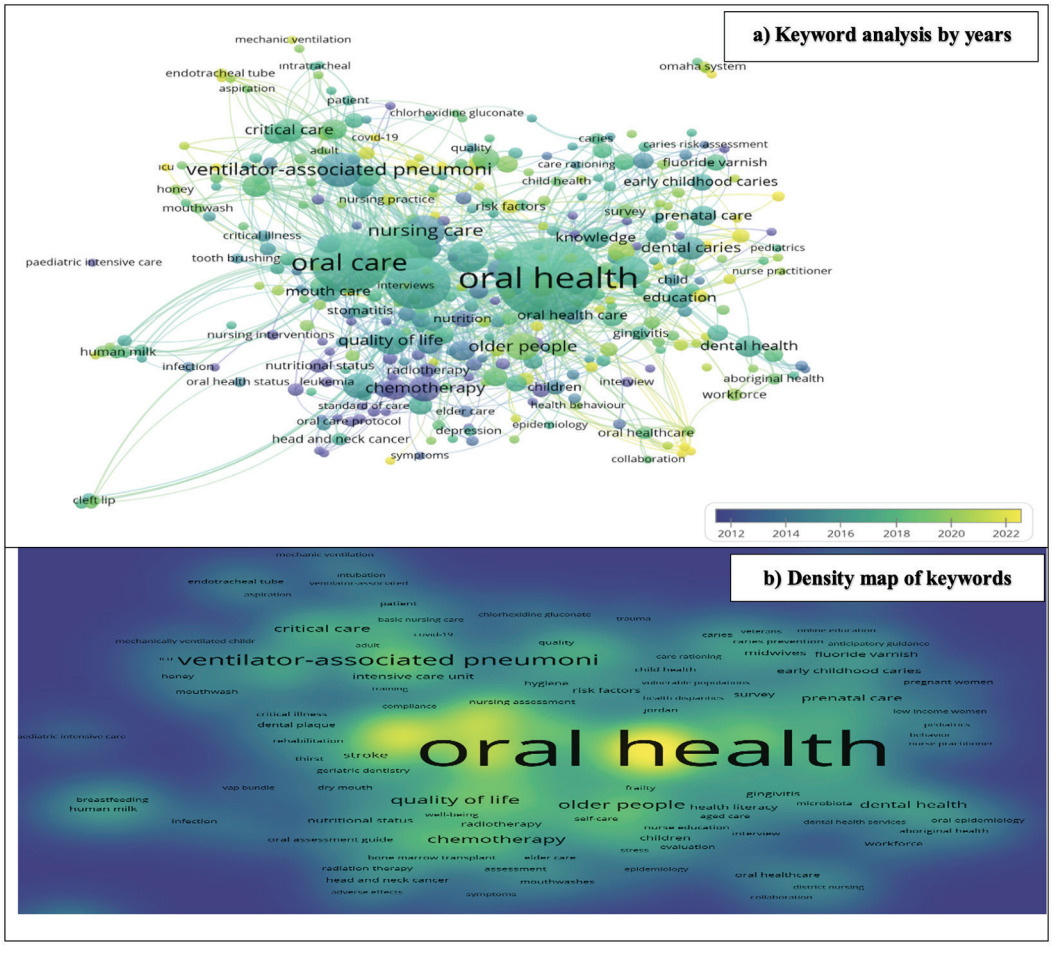

Figure 5.
Keyword analyses

the most researched and frequently cited topics related to oral care include oral care practices for intensive care patients, ventilator-associated pneumonia, products used for oral care, the frequency of care, and the documentation of these practices.

The main purpose of common word analysis is to identify keywords. Common word analysis shows the relationship between concepts or words in the titles, abstracts, or keywords of the studies in the bibliometric analysis (24). The keywords searched ("oral care", "mouth care", "oral health", "oral hygiene") in the research were common keywords used in the studies conducted in the field. In contrast to these keywords, other frequently used keywords were "ventilator-associated pneumonia", "pregnancy", "cancer" and "quality of life". Pregnant women, patients with cancer, and ventilator-associated intensive care unit patients are considered vulnerable patient groups and risk groups for oral health (13,28). Ventilator-associated pneumonia is one of the most common and important causes of morbidity and mortality, especially in the ICU, when intubated patients do not receive adequate oral care (12,36). Dry mouth, mucositis, radiation caries, altered taste perception, fibrosis of the masticatory muscles, ulcerative lesions, and some oral complications are common in patients with cancer during and after treatment (37,38). Therefore, oral care practices are considered an important parameter of supportive care for preventing complications that may occur before and after treatment in patients with cancer (38). Oral care practices have been shown to prevent many oral complications, such as mucositis, and to improve oral comfort and quality of life in many studies involving patients with cancer (39). Physiological changes occurring in the body during pregnancy lead to an increased risk of gingivitis in the oral cavity and many oral-related adverse conditions. Untreated gingivitis can lead to periodontitis, loss of tooth attachment, and permanent damage to the supporting structures of the tooth (40,41). The literature reports that approximately 60-75% of pregnant women may develop periodontal disease, which not only damages the oral cavity but may also affect the health of the developing fetus and lead to adverse pregnancy outcomes (42). Therefore, oral care practices during pregnancy are crucial for maternal and fetal health. Oral health is also known to have a significant impact on an individual's overall psychophysical health and quality of life. Because oral health affects many daily activities, such as speaking, laughing, chewing, swallowing, tasting, and smiling, the quality of life of an individual is affected to varying degrees when oral health deteriorates (1). Many studies have shown that poor oral health negatively affects patients' perceptions of quality of life (43-45). According to the results of the keyword analysis, the fact that the words ventilator-associated pneumonia, pregnancy, cancer, and quality of life were used more frequently indicates that researchers are interested in these topics and that these topics will be among the important research areas for future studies.

Therefore, the content of published articles on oral health and care varies. For example, some studies investigated the oral health and care practices and behaviors of nurses and caregivers working in different centers (intensive care, home care, nursing homes, retirement homes, etc.) (8,37,46,47) some studies evaluated oral care and oral hygiene practices in the elderly (9,10), some studies evaluated different oral care solutions (5% sodium bicarbonate, 0.2% chlorhexidine, 0.12% chlorhexidine, saline solution, etc.) (11,28,48) or oral care protocols on oral hygiene and oral health, and some studies investigated the experiences of nurses and caregivers regarding oral care practices (49,50). In addition, in recent years, many international scientists have focused on investigating the impact of oral health on quality of life (51,52). The World Health Organization (WHO), in its strategic objectives for establishing a Global Strategy on Oral Health and achieving the Sustainable Development Goals by 2030, has outlined research priorities in areas such as health systems, applied sciences, workforce models, digital technologies, and the public health dimension of oral diseases and oral health status (53). Following the WHO's global strategy, health policies and future research in various countries are likely to focus more on these topics.

Study Limitations

The research data were selected from the "WoS" database because it is one of the most accepted and preferred databases in the world, and the literature in its collection is of superior quality. The main limitation of this study is that the research database consists only of publications published in "WoS". However, some research in this area is also published in nursing journals that are not indexed in "WoS". If more articles had been included in the study, the results of the analysis might have been different. In addition, sources other than studies published as articles were not included in the study, and in-depth content analysis was not performed on the included studies. Instead, descriptive and bibliographic data analysis was performed.

Conclusion

This research is important for providing information about the research and publication performance of countries and institutions on oral health and oral care in nursing. According to the results of this study, the number of articles and citations related to oral health and oral care in the field of nursing has increased rapidly in the last 10 years. It was determined that there is more interest in articles that show the importance and effectiveness of oral care practices in the elderly and pregnant women, in the prevention of ventilator-associated pneumonia, and in improving quality of life, and more articles were published on these topics. Based on these results, it can be concluded that the number of publications on oral health and oral care and the interest in this field will continue to increase. However, less research has been conducted on newborns, children, and adolescents compared with other age groups. There is also a scarcity of studies examining oral care and practices among individuals with chronic illnesses and mental health disorders, as well as patients with oral health conditions (such as stomatitis, ulcerations, mucositis, dental caries,

gingivitis, halitosis, and the use of dental prostheses, etc.). In alignment with the WHO's global objectives, we are likely to see an increase in comprehensive research focusing on the application of digital technologies in oral health and diseases, the effectiveness of oral health practices, and the public health implications of oral health. Future studies can be conducted more comprehensively using other databases, such as Scopus, ScienceDirect, and Google Scholar. In addition, broad-based studies, including study topics, study dates, citation status, and general orientation analyses, can be planned in the future.

Ethics Committee Approval: This was a retrospective review of studies published in WoS, and ethics committee approval was not required.

Footnotes

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References

1. Baiju RM, Peter E, Varghese NO, Sivaram R. Oral health and quality of life: current concepts. J Clin Diagn Res. 2017;11(6): ZE21-ZE26. [Crossref]
2. Weening-Verbree LF, Schuller AA, Cheung S-L, Zuidema SU, Van Der Schans CP, Hobbelen JSM. Barriers and facilitators of oral health care experienced by nursing home staff. Geriatr Nurs. 2021;42(4):799-805. [Crossref]
3. Willis JR, Gabaldón T. The human oral microbiome in health and disease: From sequences to ecosystems. Microorganism. 2020;8(2):308. [Crossref]
4. D'Aiuto F, Gkranies N, Bhowruth D, Khan T, Orlandi M, Suvan J, et al. Systemic effects of periodontitis treatment in patients with type 2 diabetes: a 12 month single-centre, investigator-masked randomised trial. Lancet Diabetes Endocrinol. 2018;6(12):954-965. [Crossref]
5. Mai X, Genco RJ, LaMonte MJ, Hovey KM, Freudenheim JL, Andrews CA, et al. Periodontal pathogens and risk of incident cancer in postmenopausal females: the Buffalo OsteoPerio study. J Periodontol. 2016;87(3):257-267. [Crossref]
6. Payne JB, Golub LM, Thiele GM, Mikuls TR. The link between periodontitis and rheumatoid arthritis: a Periodontist's perspective. Curr Oral Health Rep. 2015;2(1):20-29. [Crossref]
7. Jang CS, Shin YS. Effects of combination oral care on oral health, dry mouth and salivary pH of intubated patients: a randomized controlled trial. Int J Nurs Pract. 2016;22(5):503-511. [Crossref]
8. Odgaard L, Kothari M. Survey of oral nursing care attitudes, knowledge and practices in a neurorehabilitation setting. J Oral Rehabil. 2019;46(8):730-737. [Crossref]
9. Andersson M, Persenius M. Good in providing oral care, but we could be better- nursing staff identification of improvement areas in oral care. SAGE Open Nurs. 2021;7:23779608211045258. [Crossref]
10. Coker E, Ploeg J, Kaasalainen S, Fisher A. A concept analysis of oral hygiene care in dependent older adults. J Adv Nurs. 2013;69(10):2360-2371. [Crossref]
11. Quinn B, Baker DL, Cohen S, Stewart SL, Lima CA, Parisa C. Basic nursing care to prevent nonventilator hospital-acquired pneumonia. J Nurs Scholarsh. 2014;46(1):11-19. [Crossref]
12. Saddki N, Mohamad Sani FE, Tin-Oo MM. Oral care for intubated patients: a survey of intensive care unit nurses. Nurs Crit Care. 2017;22(2): 89-98. [Crossref]
13. Honkavuo L. Oral health in the shadow of clinical nursing and caring science. International Journal of Caring Sciences. 2019;12(2):674-683. [Crossref]
14. Patterson Norrie T, Villarosa AR, Kong AC, Clark S, Macdonald S, Srinivas R, et al. Oral health in residential aged care: perceptions of nurses and management staff. Nurs Open. 2019;7(2):536-546. [Crossref]
15. Barbe AG, Küpeli LS, Hamacher S, Noack MJ. Impact of regular professional toothbrushing on oral health, related quality of life, and nutritional and cognitive status in nursing home residents. Int J Dent Hyg. 2020;18(3):238-250. [Crossref]
16. Li L, Ai Z, Li L, Zheng X, Jie L. Can routine oral care with antiseptics prevent ventilator-associated pneumonia in patients receiving mechanical ventilation? An update meta-analysis from 17 randomised controlled trials. Int J Clin Exp Med. 2015;8(2):1645-1657. [Crossref]
17. Rosário WR, de AraujoA VV, Costa FF, Farias ACR, Freitas MS, de Souza RG, et al. Association between metabolic syndrome and oral health: a bibliographic review. Electronic Journal Collection Health. 2020;12(10):e4322. [Crossref]
18. Zhang J, Weng Y, Qiao M, Chen W, Zhang L. Research status, hotspots and trends on oral care research in the elderly published from 2002 to 2022: a bibliometric analysis - a review article. Nurs Open. 2023;10(8):4907-4918. [Crossref]
19. Donthu N, Kumar S, Mukherjee D, Pandey N, Lim WM. How to conduct a bibliometric analysis: an overview and guidelines. Journal of Business Research. 2021;133: 285-296. [Crossref]
20. Özkan S. Understanding digital inequality: a bibliometric analysis for early detection and action. İstanbul Aydın Üniversitesi Sosyal Bilimler Dergisi. 2023;15(4):547-571. [Crossref]
21. Munro CL, Grap MJ. Oral health and care in the intensive care unit: state of the science. Am J Crit Care. 2004;13(1):25-34. [Crossref]
22. Munro CL, Grap MJ, Jones DJ, McClish DK, Sessler CN. Chlorhexidine, toothbrushing, and preventing ventilator-associated pneumonia in critically ill adults. Am J Crit Care. 2009;18(5):428-437. [Crossref]
23. Grap MJ, Munro CL, Ashtiani B, Bryant B. Oral care interventions in critical care: frequency and documentation. Am J Crit Care. 2003;12(2):113-118. [Crossref]
24. Bağıs M. Main analysis techniques used in bibliometric research. In: Öztürk O, Gürler G (editors). Bibliometric analysis as a literature review tool. 2nd ed., İstanbul: Nobel Scientific Works, 2021[Crossref]
25. Aslan E. Sosyal bilim araştırmalarında VOSviewer ile bibliyometrik haritalama ve örnek bir uygulama. Anadolu Üniversitesi Sosyal Bilimler Dergisi. 2022; 22(Özel Sayı 2): 33-56. [Crossref]
26. Tanguay A, LeMay S, Reeves I, Gosselin É, St-Cyr-Tribble D. Factors influencing oral care in intubated intensive care patients. Nurs Crit Care. 2020;25(1):53-60. [Crossref]
27. Jackson L, Owens M. Does oral care with chlorhexidine reduce ventilator-associated pneumonia in mechanically ventilated adults? Br J Nurs. 2019;28(11):682-689. [Crossref]
28. Kes D, Aydın Yıldırım T, Kuru C, Pazarlıoğlu F, Çiftci T, Özdemir M. Effect of 0.12% Chlorhexidine use for oral care on ventilator-associated respiratory infections: a randomized controlled trial. J Trauma Nurs. 2021;28(4):228-234. [Crossref]
29. Kim NY, Ryu S, Kim Y-H. Effects of oral care using chlorhexidine gluconate on ventilator-associated pneumonia and mortality: a systematic review and meta-analysis. Korean J Adult Nurs. 2019;31(2):109-122. [Crossref]
30. Zhang Y, Zhao Y, Xu C, Zhang X, Li J, Dong G, et al. Chlorhexidine exposure of clinical Klebsiella pneumoniae strains leads to acquired resistance to this disinfectant and to colistin. Int J Antimicrob Agents. 2019;53:864-867. [Crossref]
31. Brookes ZLS, Bescos R, Belfield LA, Ali K, Roberts A. Current uses of chlorhexidine for management of oral disease: a narrative review. J Dent. 2020;103:103497. [Crossref]

32. Collins T, Plowright C, Gibson V, Stayt L, Clarke S, Caisley J, et al. British Association of Critical Care Nurses: evidence-based consensus paper for oral care with in adult critical care units. Nurs Crit Care. 2021;26:224-233. [Crossref]
33. De Cassai A, Pettenuzzo T, Busetto V, Legnaro C, Pretto C, Rotondi A, et al. Chlorhexidine is not efective at any concentration in preventing ventilator-associated pneumonia: a systematic review and network meta-analysis. J Anesth Analg Crit Care. 2024;4:30. [Crossref]
34. Cuthbertson BH, Dale CM. Less daily oral hygiene is more in the ICU: yes. Intensive Care Med. 2021;47(3):328-330. [Crossref]
35. Cooper AS. Oral hygiene care to prevent ventilator-associated pneumonia in critically ill patients. Critical Care Nurse. 2021;41(4):80-82. [Crossref]
36. Hanlon P. Preventing VAP: research, strategies, and suggestions. The Journal for Respiratory Care Practitioners. 2017;30(5):22–24. [Crossref]
37. Quinn BG, Campbell F, Fulman L, Harding J, Dargan S, Mathlin J. et al. Oral care of patients in the cancer setting. Cancer Nursing Practice. 2020;19(5):35-42. [Crossref]
38. Yu Y-T, Deng J-L, Jin X-R, Zhang Z-Z, Zhang X-H, Zhou X. Effects of 9 oral care solutions on the prevention of oral mucositis: a network meta-analysis of randomized controlled trials. Medicine. 2020;99(16). [Crossref]
39. Nishikawa M, Honda M, Kimura R, Kobayashi A, Yamaguchi Y, Hori S. et al. The effects of intensive oral care before surgery for gastric cancer patients. Oral Diseases. 2021;27(7):1847-1853. [Crossref]
40. Hoerler SB, Jenkins S, Assad D. Evaluating oral health in pregnant women: knowledge, attitudes and practices of health professionals. Journal of Dental Hyjgiene. 2019;93(1):16-22. [Crossref]
41. Komine-Aizawa S, Aizawa S, Hayakawa S. Periodontal diseases and adverse pregnancy outcomes. Journal of Obstetrics Gynaecology Research. 2019;45(1):5-12. [Crossref]
42. Yenen Z, Ataçağ T. Oral care in pregnancy. Journal of the Turkish-German Gynecological Gynecol Association. 2019;20:264-268. [Crossref]
43. Koistinen S, Olai L, Ståhlnacke K, Fält A, Ehrenberg A. Oral health-related quality of life and associated factors among older people in short-term care. International Journal of Dental Hygiene. 2020;18:163-172. [Crossref]
44. Lim C, Lee H, Park G. Effects of oral care interventions on oral health and oral health-related quality of life among denture-wearing older adults. Korean Journal of Adult Nursing, 2021;33(1):76-86. [Crossref]
45. McCormack B, Dewing J, McCance T. Developing person-centred care: addressing contextual challenges through practice development. The Online Journal of Issues in Nursing. 2011;16(2):3. [Crossref]
46. Alja'afreh MA, Mosleh SM, Habashneh SS. Nurses' perception and attitudes towards oral care practices for mechanically ventilated patients. Saudi Medical Journal. 2018;39(4):379-385. [Crossref]
47. Jablonski RA, Kolanowski AM, Azuero A, Winstead V, Jones-Townsend C, Geisinger ML. Randomised clinical trial: efficacy of strategies to provide oral hygiene activities to nursing home residents with dementia who resist mouth care. Gerodontology. 2018;35:365-375. [Crossref]
48. Murray J, Scholten I. An oral hygiene protocol improves oral health for patients in inpatient stroke rehabilitation. Gerodontology. 2018;35(1):18-24. [Crossref]
49. Delgado MB, Latour J, Neilens H, Griffiths S. Oral care experiences of palliative care patients, their relatives, and health care professionals: a qualitative study. Journal of Hospice & Palliative Nursing. 2021;23(3):229-237. [Crossref]
50. Prendergast V, Jakobsson U, Renvert S, Hallberg IR. Effects of a standard versus comprehensive oral care protocol among intubated neuroscience ICU patients: results of a randomized controlled trial. Journal of Neuroscience Nursing. 2012;44(3):134-146. [Crossref]
51. Larsson P, Bondemark L, Häggman-Henrikson B. The impact of oro-facial appearance on oral health-related quality of life: a systematic review. Journal of Oral Rehabilitation. 2021;48(3):271-281. [Crossref]
52. Saarela RKT, Hiltunen K, Kautiainen H, Roitto H-M, Mäntylä P, Pitkälä KH. Oral hygiene and health related quality of life in institutionalized older people. European Geriatric Medicine. 2022;13(1):213-220. [Crossref]
53. World Health Organization (WHO). Global strategy and action plan on oral health 2023–2030. Geneva: World Health Organization; 2024. Licence: CC BY-NC-SA 3.0 IGO. [Crossref]