

ORIGINAL ARTICLE

Bibliometric Analysis of Studies on Smoking Cessation in the Field of Nursing

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Main Points

- Smoking is one of the leading causes of death in the world.
- Data from studies on smoking are visualized.
- There is an increasing interest in smoking cessation in the nursing field.
- Less-studied topics related to smoking should be focused on in the field of nursing.

Abstract

The bibliometric analysis method was used to evaluate the articles both qualitatively and quantitatively and to visualize the data. “Web of Science Core Collection” database and the VOSviewer program were used to obtain and analyze the data. Distribution of studies by year, author country institution analysis, journal and author citation analysis, journal and author co-citation analysis, and keyword analysis was carried out. Two hundred authors representing 45 countries and 200 institutions contributed to a total of 285 studies on smoking cessation published in 84 journals between 2003 and 2023. While *Journal of Addictions Nursing* was determined as the journal in which the largest number of articles were published, *Research in Nursing and Health* was determined as the most cited journal. The top three countries that provide the most support for published articles are the United States, Australia, and Canada. The five most frequently used keywords in the published studies were “smoking cessation,” “smoking,” “pregnancy,” “nurses/nursing,” and “tobacco.” The results of this bibliometric analysis showed that the researchers have had an increasing interest in smoking cessation in the nursing field over the past 20 years. It is recommended to focus on less-studied topics in studies to be planned on smoking in the field of nursing.

Keywords: Bibliometric analysis, nurses, nursing, smoking cessation

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Introduction

A quarter of the world’s adult population uses tobacco products, and tobacco use kills more than eight million people each year. Most of these deaths occur in low- and middle-income countries. Smoking affects not only smokers but also passive smokers and causes 1.2 million deaths each year due to exposure to cigarette smoke (WHO, 2023). Of the total deaths worldwide 11.5% are associated with smoking-related reasons (WHO, 2018).

Public health interventions are planned by being influenced by studies on smoking cessation and developing new policies in this regard. The

number of scientific articles on smoking cessation has increased over time (Larsen & Von Ins, 2010). The publication of scientific papers allows for building an evidence base, disseminating knowledge learned from research, and enabling public health interventions/discussions. The literature on smoking cessation helps public health institutions prepare appropriate policies. Furthermore, analyzing this literature in terms of thematic trends such as journals, contributing authors, countries, and number of published studies will provide insight about the advances, challenges, and future directions for public health institutions, researchers studying in this field, and grant funding institutions (Chapman & Derrick, 2012; Cohen et al., 2010).

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Bibliometric analysis is commonly used to characterize research activities and to discover new trends in specific research areas (Guler et al., 2016). In this study, a bibliometric analysis was used to investigate studies on smoking cessation in terms of their number, keywords, journals, country, and global trends in this regard. In addition, it was aimed to visualize the data to help identify trends related to this issue.

This bibliometric study was conducted to determine and visualize the trends of studies published on smoking cessation in the field of nursing between 2003 and 2023.

Methods

Conducted Analyses

For this purpose, the following analyses were made:

- Change in the number of publications of studies over the years,
- Author, country, and institution analyses,
- Journal and citation analyses,
- Journal and author co-citation analysis,
- Subject clustering and keyword analysis.

Study Design and Strategy

In this study, a bibliometric analysis of studies on smoking cessation in the field of nursing was carried out using statistical and bibliometric visualizations. Bibliometric analysis is a statistical analysis tool that allows both quantitative and qualitative evaluation of articles (Donthu et al., 2021).

The “Web of Science Core Collection” database was preferred to collect the data of the study because it is compatible with the VOSviewer program, is one of the most used databases for analyzing scientific publications, and provides access to citation statistics and bibliographic data of scientific publications (Donthu et al., 2021; Yu et al., 2020). The data were collected in August 2023 in accordance with the inclusion and exclusion criteria.

Inclusion Criteria

- Studies in article and review design as a study type,
- Studies published in English,
- Studies conducted between 2003 and 2023,
- Studies in the nursing category of WoS,
- Studies in the SCIE, SSCI, or ESCI indexes from the WoS index.

The following keywords were decided by using Medical Subject Headings (aka MeSH) terms in the Web of Science database: “smoking cessation, stopping smoking, quitting smoking, giving up smoking.” A search was made using the combinations of these keywords and 15,857 articles were retrieved. Then, the following filters were used in the Web of Science database according to the inclusion and exclusion criteria: “review” and “article” were selected as the study type, “English” was chosen as the publication language, “nursing” was chosen as the research field, and the period “2003-2023” was chosen as the publication year. After all these processes were done, 285 studies remained for bibliometric analysis.

Data Analysis

The data obtained from the database were downloaded as a single file in the format of plain text. Bibliometric analysis was

performed using VOSviewer software version 1.6.19. VOSviewer is a computer program for generating, visualizing, and exploring bibliometric maps of scientific data. Items analyzed in the VOSviewer program are shown with a colored circle.

For each item, the font size of the item label and the size of the item circle depend on the weight of the item, and if items are assigned to clusters, the color of an item is determined by the cluster to which the item belongs. In scatter view, each point on a map has a color that depends on the density of the items at that point. The higher the number of items in the neighborhood of a point and the weights of the neighboring items, the closer the color of the point is to red. On the other hand, the fewer items in the neighborhood of a point and the lower the weights of the neighboring items, the closer the color of the point is to blue. The view of cluster density can be used only if items are assigned to clusters. The view of cluster density is similar to the normal density view, except that the density of the items is viewed separately for each cluster of items. In the view of cluster density, the color of a point on a map is close to the color of a specific cluster if there are many items of that cluster around the point (van Eck & Waltman, 2011).

Ethical Considerations

Ethics committee approval is not required since data were not collected from any individual in this study and document analysis was used as the data collection method.

Results

Distribution of the Studies by Years

Among 285 studies on smoking cessation in the field of nursing, 257 were articles and 28 were review articles. The number of publications by years among the 285 studies varied between 3 and 25. While the publications ($n = 25$) were conducted mostly in 2019, the least publications ($n = 3$) were conducted in 2003.

Author, Country, and Institution Analysis

There were 200 authors from a total of 45 countries who contributed to 285 studies published on smoking cessation in the field of nursing. Froelicher ES ($n = 8$), Bialous SA ($n = 8$), and Sarna L ($n = 7$) were the top three most productive authors in this field, contributing the most to the field. The top 10 countries that supported the published articles were the United States ($n = 136$), Australia ($n = 31$), Canada ($n = 20$), South Korea ($n = 17$), England ($n = 16$), Netherlands ($n = 11$), Spain ($n = 11$), China ($n = 9$), Taiwan ($n = 9$), and Sweden ($n = 8$) (Table 1). In addition, there were a total of 200 institutions that contributed to studies of smoking cessation in the field of nursing, and the first three institutions that contributed the most were the University of California System ($n = 17$), the University of California San Francisco ($n = 14$), and the University of Ohio ($n = 11$). The institution that provided the most funding for articles on smoking cessation in the nursing field was “United States Department of Health Human Services” ($n = 16$). Table 1 shows the top 10 authors, countries, and institutions who contributed to the field and their information of funding support.

Journal and Citation Analysis

The 285 studies included in the bibliometric analysis were published in 84 journals. The publications were mostly published

Table 1.
Top Ten Authors Who Contributed the Most to the Field, Country, Institution, Funding Agency, and Journal Information

Name of Author	Number of Articles	Country	Number of Articles	Institution	Number of Articles	Institution Providing Funding Support	Number of Articles	Journal	Number of Articles
Froelicher, Erika S	8	USA	136	University of California System	17	US Department of Health Human Services	16	<i>Journal of Addictions Nursing</i>	18
Bialous SA	8	Australia	31	University of California San Francisco	14	National Institutes of Health (NIH) USA	11	<i>Journal of Advanced Nursing</i>	15
Sarna L	7	Canada	20	University System of Ohio	11	National Health and Medical Research Council (NHMRC) (Australia)	6	<i>Midwifery</i>	12
Okoli, Chizimuzo	5	South Korea	17	University of Kentucky	9	Centers for Disease Control and Prevention (USA)	4	<i>Public Health Nursing</i>	12
Duffy Sonia A	5	England	16	University of Newcastle	9	Ministry of Science and Technology (Taiwan)	4	<i>Nursing Research</i>	11
De Vries Hein	5	Netherlands	11	Inha University	8	NIH National Institute of Nursing Research	4	<i>Journal of Clinical Nursing</i>	10
Wells MJ	5	Spain	11	University of California Los Angeles	8	European Union	3	<i>Western Journal of Nursing Research</i>	10
Duaso MJ	4	China	9	University of Michigan	7	Ministry of Health Labor and Welfare Japan	3	<i>International Journal of Nursing Studies</i>	8
Newhouse Robin P	4	Taiwan	9	University of Michigan System	7	NIH National Cancer Institute	3	<i>Journal of Obstetric Gynecologic and Neonatal Nursing</i>	7
Martinez C	4	Sweden	8	Maastricht University	6	NIH National Institute on Drug Abuse	3	<i>Journal of Nursing Scholarship</i>	7

mostly in the *Journal of Addictions Nursing* ($n = 18$), which was followed by *Journal of Advanced Nursing* ($n = 15$), *Midwifery* ($n = 12$), *Public Health Nursing* ($n = 12$), *Nursing Research* ($n = 11$), *Journal of Clinical Nursing* ($n = 10$), *Western Journal*

of Nursing Research ($n = 10$), *International Journal of Nursing Studies* ($n = 8$), *Journal of Obstetric Gynecologic and Neonatal Nursing* (JOGGN) ($n = 7$), and *Journal of Nursing Scholarship* ($n = 7$), respectively.

Table 2.
Top 10 Most Cited Publications and the Journal in Which They Were Published

Publications	Authors	Year	Name of Journal	Total Citations
Efficacy of a smoking-cessation intervention for elective-surgical patients	Ratner PA et al.	2004	<i>Research in Nursing and Health</i>	81
Qualitative systematic review: barriers and facilitators to smoking cessation experienced by women in pregnancy and following childbirth	Flemming K et al.	2015	<i>Journal of Advanced Nursing</i>	73
The effect of a multi-component smoking cessation intervention in African American women residing in public housing	Andrews JO et al.	2007	<i>Research in Nursing and Health</i>	72
Motivational interviewing as a smoking cessation intervention for patients with cancer: Randomized controlled trial	Wakefield M et al.	2004	<i>Nursing Research</i>	66
Frequency of nurses' smoking cessation interventions: report from a national survey	Sarna L et al.	2009	<i>Journal of Clinical Nursing</i>	65
Efficacy of smoking cessation intervention among special populations - Review of the Literature From 2000 to 2005	Doolan DM et al.	2006	<i>Nursing Research</i>	55
The effectiveness of nicotine-patch therapy for smoking cessation in patients with schizophrenia	Chou K et al.	2004	<i>International Journal of Nursing Studies</i>	49
Psychiatric nurses' ethical stance on cigarette smoking by patients: Determinants and dilemmas in their role in supporting cessation	Lawn S et al.	2006	<i>International Journal of Mental Health Nursing</i>	45
Health care providers' engagement in smoking cessation with pregnant smokers	Okol, CTC et al.	2010	<i>Journal of Obstetric Gynecologic and Neonatal Nursing</i>	43
Stages and processes of smoking cessation among adolescents	Ham OK et al.	2007	<i>Western Journal of Nursing Research</i>	43

The purpose of citation analysis is to identify the most influential publications in a research field and to analyze the relationships between publications (Donthu et al., 2021). A total of 10,658 references were cited by the 285 studies published on smoking cessation in the field of nursing between 2003 and 2023. The total number of citations to the 285 studies was 2,944 and the average number of citations per study was 10.32. The most cited article ($n = 81$) was the study entitled "Efficacy of a smoking-cessation intervention for elective-surgical patients" conducted by Ratner et al., and published in the journal *Research in Nursing and Health*. Table 2 shows the top ten most cited publications.

Journal and Author Co-citation Analysis

The purpose of co-citation analysis is to analyze the relationships between cited publications to figure out the emergence of main themes in a research field (Donthu et al., 2021). This analysis includes the co-citation analysis of the journals and authors for the studies included in the bibliometric analysis that are commonly cited. The purpose of the journal co-citation analysis is to determine the journals in which studies on smoking cessation in the field of nursing are published. The journal that the published studies co-cite the most was the *Nicotine & Tobacco Research* ($n = 312$), which was followed by *Cochrane Database Systematic Reviews* ($n = 291$) and *Addictive Behaviors* ($n = 282$), respectively.

In author co-citation analysis, authors who have worked in the field and authors who have contributed to the formation of research foci are shown in a network (Donthu et al., 2021; Van Eck & Waltman, 2011a). The first three most cited authors in the

285 studies published in the field were Sarna ($n = 104$), Fiore ($n = 100$), and Prochaska ($n = 91$). In this sense, the studies of these authors were the ones that contributed the most to the research between 2003 and 2023 (Figure 1).

Keyword Analysis

In word analysis, words are produced from author keywords. In cases where it is limited, noteworthy words can be obtained from article titles, abstracts, or full texts (Donthu et al., 2021). In the word network analysis, the most used common words were analyzed. In this context, "smoking cessation" ($n = 182$), which is the most used keyword for smoking cessation in the field of nursing, was excluded from the analysis in order to make other words appear easily in the bibliometric analysis. The next ten keywords were "smoking" ($n = 48$), "pregnancy" ($n = 27$), "nurses" ($n = 24$), "nursing" ($n = 18$), "tobacco" ($n = 18$), "qualitative research" ($n = 16$), "tobacco use cessation" ($n = 13$), "motivational interviewing" ($n = 12$), "self efficacy" ($n = 12$), and "tobacco use" ($n = 11$) (Figure 2).

Discussion

In this study, a bibliometric analysis of 285 studies published on smoking cessation in the field of nursing was performed using the VOSviewer program. In the study, important articles, influential authors, current research topics, and developing trends in this field were determined. As a result of the literature review, we found no bibliometric analysis examining the studies on smoking cessation in the field of nursing between 2003 and 2023, which

cessation.” Accordingly, this suggests that the developments related to smoking cessation, new studies, and public health policies to be developed on this subject will continue by increasing the up-to-dateness of studies on this subject in the field of nursing.

When the countries where the studies on smoking cessation were conducted were examined, the publications were conducted mostly in the United States, Australia, and Canada, respectively. These countries were followed by South Korea, England, the Netherlands, Spain, China, Taiwan, and Sweden, respectively. A study conducted in America reported that smoking, which reached its peak in 1964, gradually decreased, and factors such as smoking-associated health problems such as cancer, a high tax increase, and restriction of smoking in public places were effective in this situation (Cummings & Proctor, 2014). It is reported that the number of smokers in Australia also tends to decrease over the years, and high tax rates are effective; a similar tax increase should be applied to rolled cigarettes along with factory-produced cigarettes so that individuals do not turn to rolling cigarettes (Wilkinson et al., 2019). According to a study conducted in Canada, it was determined that an increase of 10% in the price of cigarettes caused a decrease of 11.3% in starting smoking and 10.2% in smoking intensity (Cui et al., 2019).

Although there were 200 institutions contributing to the studies, it can be asserted that the top ten institutions were universities, and the institutions providing funding support were mostly non-university institutions. According to this information, it is thought that conducting studies on smoking and providing funding by institutions and institutes other than the universities have made significant contributions to the field. It is also emphasized in the literature that strengthening the interaction between universities and other institutions contributes to the improvement of the field (Wang et al., 2020).

The 285 studies included in the bibliometric analysis were published in 84 journals, and the journal with the highest number of publications was *Journal of Addictions Nursing*, followed by *Journal of Advanced Nursing*, *Midwifery*, *Public Health Nursing*, and *Nursing Research*, respectively. It can be asserted that these five journals are the journals that have accepted the most publications on smoking at the international level in the last 20 years. The journal most cited by the studies on smoking was the journal *Nicotine & Tobacco Research*. When examining the most cited journals, it can be asserted that they were the journals that publish the most on smoking.

The first 10 keywords in the studies included in the bibliometric analysis, which are the reflection of the study subjects, were “smoking,” “pregnancy,” “nurses,” “nursing,” “tobacco,” “qualitative research,” “tobacco use cessation,” “motivational interviewing,” “self efficacy” and “tobacco use.” It can be said that the trends in recent years were mostly items with large volume such as smoking, pregnancy, nurses, tobacco use cessation, and self-efficacy. Also, nurses who conduct scientific studies on smoking have focused on quitting smoking, women/pregnancy, motivational interviewing, and self-efficacy, and their trends were in this direction.

This bibliometric analysis revealed the current state of smoking-related studies in nursing, as well as the top journals, institutions,

and authors in terms of contribution and increasing and decreasing trends. There has been an increasing interest in smoking cessation in the last 20 years in the field of nursing. The studies included in the bibliometric analysis focused on keywords such as “smoking,” “pregnancy,” “nurses,” “nursing,” “tobacco,” “qualitative research,” “tobacco use cessation,” “motivational interviewing,” “self efficacy,” and “tobacco use.” Nowadays nurses mainly focus on topics that include these keywords. According to these results, it is thought that focusing on the less studied subjects in the studies to be planned about smoking in the field of nursing and increasing global cooperation may be effective in deepening the international literature together with nursing care.

Limitations: Since this study was conducted in the Web of Science Core Collection database, studies published in non-Web of Science indexed journals were not included in this analysis. The second limitation is that only articles and review articles were included in the analysis. The third limitation is the inclusion of only English-language studies in the analysis.

Ethics Committee Approval: N/A

Informed Consent: N/A

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