

Mapping the Nursing Literature in Wound, Ostomy and Incontinence Care: A Bibliometric Analysis

Yara, Stoma ve İnkontinans Bakımında Hemşirelik Literatürünün Haritalanması: Bibliyometrik Bir Analiz

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ABSTRACT

This search was undertaken to provide a structured macroscopic overview of the characteristics and research advances associated with the nursing literature in wound, ostomy, and incontinence care. Web of Science was selected as the search engine for the bibliometric analysis. The analysis was performed using the "biblioshiny" application available in the bibliometrics package R. The study analysed 8537 nursing articles on wounds, 737 on ostomies and 3459 on urinary incontinence. There are 1767 productive journals on wound care, 230 on ostomy care and 854 on incontinence care. 9 journals on wounds, 5 on ostomies and 17 on incontinence were in the first zone according to Bradford's law. It was found that authors' publication productivity did not follow Lotka's law in any of the three fields. The study analysed by keyword plus. In the nursing literature, research on wounds tends to focus on care, management and prevention; research on ostomies: quality of life, surgery and stoma; research on incontinence tends to focus on prevalence, urinary incontinence and quality of life. Looking at the top five countries producing nursing publications on this topic; for wounds USA, Australia, China, UK, Japan; for ostomy USA, China, UK, Turkey, Brazil; for incontinence Italy, Ireland, Netherlands, Sweden, Turkey. This bibliometric study provided comprehensive information on global trends and highlights in wound, ostomy and incontinence research, three specific fields of WOC nursing literature. It also identified common and different aspects of the literature across these three specific fields of WOC nursing.

Keywords: Wound, Ostomy, Incontinence, Nursing, Bibliometric analysis

ÖZ

Bu araştırma, yara, ostomi ve inkontinans bakımında hemşirelik literatürüyle ilişkili özelliklerin ve araştırma ilerlemelerinin yapılandırılmış makroskobik bir genel görünümünü sağlamak amacıyla yapıldı. Bibliyometrik analiz için arama motoru olarak Web of Science seçildi. Analiz, bibliyometrik paket R'de bulunan "biblioshiny" uygulaması kullanılarak gerçekleştirildi. Çalışmada yaralar üzerine 8537, ostomiler üzerine 737 ve idrar kaçırma üzerine 3459 hemşirelik makalesi analiz edildi. Yara bakımı üzerine 1767, ostomi bakımı üzerine 230 ve inkontinans bakımı üzerine 854 üretken dergi bulunmaktadır. Bradford yasasına göre yaralar üzerine 9, ostomiler üzerine 5 ve inkontinans üzerine 17 dergi ilk bölgede yer almaktadır. Yazarların yayın üretkenliğinin üç alandan hiçbirinde Lotka yasasını takip etmediği bulunmuştur. Çalışma anahtar kelime artı ile analiz edilmiştir. Hemşirelik literatüründe yaralar üzerine yapılan araştırmalar bakım, yönetim ve önlemeye odaklanma eğilimindedir; ostomiler üzerine araştırma: yaşam kalitesi, cerrahi ve stoma; idrar kaçırma üzerine araştırma yaygınlık, idrar kaçırma ve yaşam kalitesine odaklanma eğilimindedir. Bu konuda hemşirelik yayınları üreten ilk beş ülkeye bakıldığında; yaralar için ABD, Avustralya, Çin, İngiltere, Japonya; ostomi için ABD, Çin, İngiltere, Türkiye, Brezilya; inkontinans için İtalya, İrlanda, Hollanda, İsveç, Türkiye. Bu bibliyometrik çalışma, yara, ostomi ve idrar inkontinansı araştırmalarındaki küresel eğilimler ve WOC hemşirelik literatürünün üç belirli alanı hakkında kapsamlı bilgi sağladı. Ayrıca, bu üç belirli WOC hemşirelik alanındaki literatürün ortak ve farklı yönlerini belirledi.

Anahtar kelimeler: Yara, Stoma, İnkontinans, Hemşirelik, Bibliyometrik analiz

Key Points

*This bibliometric study provided comprehensive information on global trends and highlights in wound, ostomy and incontinence research.

*Developed countries were the most productive countries for WOC nursing literature and publication collaborations were concentrated in these fields. In some of the less developed countries there were no publications at all.

No ethical evaluation was required for this study.

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INTRODUCTION

Wound, ostomy and continence (WOC) care management is a speciality of WOC nursing. As well as providing high quality care in their specialist field, WOC nurses research and publish on the impact of this unique care on patient outcomes. Defined as nurses certified by the Wound, Ostomy and Continence Nursing Certification Board.¹ However, in many countries today, the publication productivity of nurses who are experts in their field and trained through national certification programmes is also important.²

Wound, ostomy and continence (WOC) nurses are experts in knowledge translation (KT) and implementation of evidence-based practice (EBP) and produce publications that contribute to outcomes across the evidence pyramid.³ Therefore, there is a gradual expansion and deepening of each of the wound, ostomy and incontinence fields of WOC nursing publications.⁴

The proliferation of academic studies on a global scale makes it increasingly difficult for readers to identify key points, such as researchers and research themes, that shape a particular field and to follow the literature.⁵ Bibliometric analysis is an innovative approach to studying the knowledge base within a particular field.⁶ Since bibliometric analysis is a method of analysis based on quantitative data, it provides objective criteria against which research results can be assessed by giving many numerical values (Kokol, 2021). In recent years, bibliometrics has attracted the attention of nursing researchers.^{7,8}

In the literature search, bibliometric studies on wounds,⁹⁻¹⁸ ostomy^{19,20} and incontinence²¹⁻²⁴ have been identified. However, these studies mostly include the results of interdisciplinary studies. To our knowledge, there is no bibliometric study that includes the results of nursing publications on incontinence. Two specific bibliometric studies related to nursing were identified: one on wounds⁹ and one on ostomy.¹⁹

Bibliometric study with focus on wound care outcomes only includes results on pressure injury prevention and measurement tools from 1997 to 2023.⁹ The bibliometric study focusing on ostomy care outcomes is a bibliometric analysis of qualitative studies on the experiences of ostomy patients published between 2002 and 2018.¹⁹ Although the number of WOC nursing publications is high, there is a limited number of bibliometric studies in the literature focusing on nursing outcomes. Existing bibliometric studies do not provide a perspective on all WOC nursing publications. Bibliometric analysis can be performed in seven categories (overview, sources, authors, documents, conceptual structure, intellectual structure and social structure).²⁵ No bibliometric study was found that included these seven categories and comprehensively analysed the nursing literature on WOC. The purpose of this study is to evaluate WOC nursing research through bibliometric analysis to provide a structured macroscopic overview of its characteristics and progress. This study is significant because it is the first comprehensive bibliometric analysis of WOC nursing publications. It is also essential in providing a comprehensive perspective by bringing together publications relating to the three specialist fields of nursing: wound care, ostomy care and continence care. According to the main purpose of the study, the following questions will be answered:

1. What is the distribution of WOC nursing research publications by country, journal and author?
2. What are the trends, most productive topics and current literature gaps in WOC nursing research?
3. What are the main themes and topics in wound, ostomy and incontinence care studies?
4. What are the opportunities and suggestions for future studies on wound, ostomy and incontinence care?

MATERIALS AND METHODS

Study design

Bibliometric research is a type of systematic literature review that applies quantitative and statistical techniques (e.g. descriptive statistics analysis, performance analysis, cluster analysis or science mapping) to bibliographic data (e.g. publications and citations).²⁶⁻²⁸ Unlike other manual methods of reviewing the literature (e.g. thematic reviews), reviews conducted using bibliometric techniques use quantitative and statistical measurements along with technology. This approach ensures a more objective and comprehensive analysis of the literature.²⁹ Bibliometrics is a reliable method of analysis that effectively provides an overview of academic literature and identifies influential studies, authors, journals, institutions and countries over time.³⁰

Regardless of the field of investigation (e.g., domain, method, or theory; Palmatier et al., 2018), bibliometric studies generally employ two main categories of analytical techniques:^{31,32} (1) performance analysis, an evaluative technique used to assess productivity and impact and (2) science mapping, a relational technique used to uncover clusters of knowledge (such as major themes and research groups) within a field.

Bibliometric methods can be used to define the social, intellectual and conceptual structure of the knowledge base of a research field.³³ Social structure maps the relationships established through collaborative publications between authors, institutions and countries in the scientific world using publication metadata.^{5,34} While the intellectual structure is inferred from co-citation networks between publications, the conceptual structure can be determined by co-word analysis.^{30,33,35}

Data sources and literature searches.

In bibliometric analysis, the selection of the most appropriate data source for the research field and question is crucial.³⁶ Web of Science (WoS), Scopus and Google Scholar are recognised as the three most important bibliometric databases.³⁷ Web of

Science (WoS) encompasses over 21,000 peer-reviewed, high-quality scientific journals globally (including Open Access journals).^{36,37} Web of Science was chosen as the search engine due to its widespread acceptance for analyzing scientific publications, and the study data was reviewed on May 11, 2024.

Relevant studies were identified according to the research question in order to perform an in-depth analysis. Firstly, a search concept was created consisting of two concepts. Concept 1 was created in 3 stages related to 3 different roles of wound and ostomy nurses. These stages are: (a) wound, (b) ostomy and (c) incontinence. For each of these stages, the first concept was linked to the second concept by the conjunction "and". The second concept was common to all three stages of the first concept. Search for concept:

a-“Wound” or “wound care” and “nurse care” or “nursing care” or “nurse”

b-“Stoma care” or “ostomy care” or “stoma” or “ostomy” or “ileostomy” or “urostomy” or “colostomy” and “nurse care” or “nursing care” or “nurse”

c-“Incontinence” or “incontinence care” and “nurse care” or “nursing care” or “nurse”

Study selection and extraction

Inclusion and exclusion criteria were first established for the selection of studies. Inclusion criteria were (1) studies containing the search terms in the title, keywords or abstract and (2) articles published in English. Exclusion criteria were: (1) articles without keywords; (2) commentaries were defined as editorials and letters.

Using the search terms, there were 10,507 publications on wound care, 1,028 publications on ostomy care and 3,779 publications on incontinence care. As these search terms are associated with nursing, the selection of nursing articles was not limited to these publications alone. Therefore, nursing articles published in both medical and non-medical journals were also included in the

study. The Web of Science search engine retrieved 8,537 articles on wounds, 737 articles on ostomies and 3,459 articles on incontinence. The abstracts of the article titles were then reviewed and all publications that met the criteria were included in this review. All bibliographic data was collected from the WOS database using the 'Save in other file formats' feature to create the bibliometric map. The content of each record, including full text and reference information, was selected and saved as 'Savedrecs.txt'. Due to the large number of records exceeding 500 in the search results, the articles were downloaded in batches of 500 and then merged into a single file.

Data analysis

The "biblioshiny" application from the Bibliometrix R package was used for comprehensive data analysis.³⁸ Biblioshiny, an open source software designed to facilitate bibliometric analysis, has a web interface that supports detailed exploration of scientific collaborations, general statistics and relationships through three-field graphs.⁵ Biblioshiny lists the most important scientific

collaborations, general statistics and relationships, etc. using the three-field chart. It is a suitable tool for in-depth bibliometric analysis.³⁹ Biblioshiny's main menu offers intuitive and well-organised developer interfaces tailored to the needs of the workflow. It allows users to perform actions in three main categories: "Source", "Author" and "Document". In addition, the menu offers logical analysis and graphical representations for three knowledge structures: conceptual, intellectual and social.²⁵ The analysis options are grouped into seven categories: 1. overview, 2. sources, 3. authors, 4. documents, 5. conceptual structure, 6. intellectual structure, and 7. social structure. Biblioshiny was used to analyse publication output, growth trends, authorship patterns, collaborations, publishing journals, keywords, current trends, subject categories, global distribution and collaborative networks.³⁸

Ethical evaluation

No ethical evaluation was required for this study.

RESULTS AND DISCUSSION

Main data statistics

The study analysed 8537 nursing articles on wounds, 737 on ostomies and 3459 on urinary incontinence. Articles on wound care were published in 1767 sources (1974-2024), ostomy care in 210 sources (1975-2024) and incontinence care in 854 sources (1972-2024). Wound, ostomy and incontinence products had annual growth rates of 12.26%, 4.04% and 8.57% respectively. The average age of the articles was 8.66, 8.46 and 8.57 years, with citation rates per article of 16.59, 13.69 and 28.36. The number of authors involved in these fields was 32.236, 2.270 and 11.874, respectively, and the number of single-author publications was 643, 71 and 214. International collaboration among the authors of these publications was 16.25%, 10.28% and 17.11% respectively. (Table 1).

Publication output and growth trend

The first nursing publication on wound care was in 1975 (three publications), and between 1976 and 2004 annual publications ranged from 0 to 66; publication output began to increase in 2005 (n=167) and peaked in 2023 with an annual production of 753 publications (Figure 1a). The first nursing publication on ostomy care was in 1974 (three publications) and between 1975 and 2003 annual publications ranged from 0 to 5; publication output began to increase in 2005 (n=18) and peaked in 2022 with an annual production of 78 publications (Figure 1b). The first nursing publication on incontinence care was in 1972 (three publications), and between 1973 and 2006 annual publications ranged from 0 to 79; publication output began to increase in 2007 (n=105) and peaked in 2023 with an annual production of 204 publications (Figure 1c).

Journals publishing articles on wound, ostomy and incontinence nursing

The majority of nursing articles on wound

ranked in decreasing order of productivity and divided into three zones.

The 9 most productive wound care journals

Table 1. Main statistics on wound ostomy and incontinence nursing care

	Description	Wound Results	Ostomy Results	Incontinence Results
MAIN INFORMATION	Timespan	1975:2024	1974:2024	1972:2024
ABOUT DATA	Sources	1767	230	854
	Documents	8587	737	3459
	Annual Growth Rate %	12.26	4.25	8.57
	Document Average Age	8.66	8.57	11.7
	Average citations per doc	16.59	13.51	28.36
DOCUMENT CONTENTS	Keywords Plus (ID)	8553	749	3918
	Author's Keywords (DE)	13259	1314	4884
AUTHORS	Authors	32236	2534	11874
	Authors of single-authored docs	643	76	214
AUTHORS COLLABORATION	Single-authored docs	778	82	257
	Co-Authors per Doc	5.65	4.7	5.1
	International co-authorships %	16.25	10.04	17.11

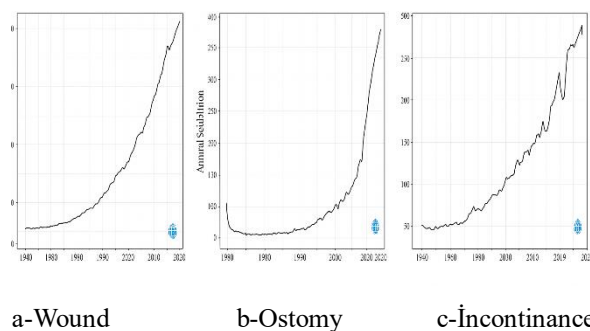


Figure 1. Annual scientific production

(n=890), ostomy (154) and incontinence (n=890) care were published in the Journal of Wound Ostomy and Continence Nursing (Table 2). Bradford's law was used to assess the number of relevant nursing articles. There are 1767 productive journals on wound care, 230 on ostomy care and 854 on incontinence care. According to the law, when journals on a given topic are divided into zones with the same number of articles, the journals are

were included in the first zone. There were 160 journals in the second zone and 1598 journals in the third zone. The top three most prolific wound care journals in the first zone were Journal of Wound Ostomy and Continence Nursing (n=890), International Wound Journal (n=499), Journal of Wound Care (n=402) (Table 2).

The 5 most prolific ostomy journals were included in the first zone. There were 37 journals in the second zone and 188 journals in the third zone (Table 2). The top three most published ostomy journals in the first zone are Journal of Wound Ostomy and Continence Nursing (n=154), Ostomy Wound Management (n=27), Journal of Clinical Nursing (n=24) (Table 2).

The 17 most productive incontinence journals were included in the first zone. There were 116 journals in the second zone and 721 journals in the third zone (Table 2). The top

three most productive incontinence journals in the first zone are Journal of Wound Ostomy and Continence Nursing (n=198), Journal of

Table 2. Most published sources

Journal	Wound Articles	Ostomy Articles	Incontinence Articles
Journal of Wound Ostomy and Continence Nursing	890	154	198
International Wound Journal	499		29
Journal of Wound Care	402		25
Advances in Skin & Wound Care	397		
Ostomy Wound Management	209	27	
Wound Practice and Research	156		
Journal of Clinical Nutrition	151		
Cochrane Database of Systematic Reviews	118		
Wound Repair and Regeneration	116		
Journal of Clinical Nursing		24	98
Journal of Advanced Nursing		22	88
Colorectal Disease		18	
Wound Management & Prevention			
Journal of the American Geriatrics Society			173
Neurourology and Urodynamics			87
International Urogynecology Journal			60
Journal Of The American Medical Directors Association			56
International Journal Of Nursing Studies			49
International Journal Of Urological Nursing			49
Journal Of Urology			49
Gerontologist			42
Geriatric Nursing			39
Archives Of Gerontology And Geriatrics			37
Bmc Geriatrics			37
Cochrane Database Of Systematic Reviews			34
Plos One			31

the American Geriatrics Society (n=173), Journal of Clinical Nursing (n=98).

Authors and collaboration

The three most relevant authors publishing on wounds are Sanada H. (n=309), Nakagami G. (n=195) and Sugama J. (n=125). The three most cited authors are; Sanada H. (n=3924), Dumville (n=2554) and Nakami G. (n=2464). The three most relevant authors publishing on ostomy are Grant M (n=36), Krouse RS. (n=31) and Hornbrook MC (n=23). The three most cited authors are the same: Grant M (n=1288), Krouse RS. (n=1044) and Hornbrook MC (n=707). (Table 3). The three most important authors publishing on incontinence are Schnelle JF. M (n=70), Ouslander JG (n=66) and Bliss (n=44). The 3 most cited authors are Schnelle JF. M (n=3458), Ouslander JG (n=3097) and Grodstein F (n=1706).

The author demonstrates his productivity through Lotka's law 12. Authors and articles were organised according to Lotka's law; of the authors with wound-related publications, 80.2% had one article, 11.9% had two articles, and 3.5% had three articles, while 1.5% of the authors were only authors with more than five publications. Of the authors with publications on ostomy, 84.2% had one article, 9.2% had two articles, and 2.6% had three articles, while 1.4% of the authors had only more than five publications. Of the authors with publications on incontinence, 80% had one article, 11.5% had two articles and 4% had three articles, while 1.9% of the authors had only more than five publications. In the research it was understood that the distribution of authors on wounds, ostomies and incontinence did not follow Lotka's law. However, authors with more than five publications should be considered as core authors, as they are more knowledgeable in their field.

Table 3. Most published Authors and Authors' Local Impact

Wound						
Element	H index	G index	M index	TC	NP	PY→start
DUMVILLE JC	30	49	1.875	2554	65	2009
SANADA H	29	43	1.381	3924	309	2004
NAKAGAMI G	27	36	1.421	2464	195	2006
SUGAMA J	24	34	1.200	1772	125	2005
AYELLO EA	22	47	1.000	2235	61	2003
SIBBALD RG	21	45	0.808	2081	52	1999
GRAY M	20	36	1.000	1357	43	2005
MOORE Z	20	34	0.952	1321	77	2004
GILLESPIE BM	19	27	1.188	795	63	2009
Ostomy						
Element	H index	G index	M index	TC	NP	PY→start
GRANT M	19	35	1.000	1288	36	2006
KROUSE RS	17	31	0.895	1044	31	2006
HORN BROOK MC	14	23	0.875	707	23	2009
BALDWIN CM	12	12	0.632	604	12	2006
WENDEL CS	12	22	0.632	650	22	2006
MCMULLEN CK	9	9	0.563	453	9	2009
RAWL SM	9	10	0.474	537	10	2006
ALTSCHULER A	8	8	0.500	328	8	2009
CARLSSON E	8	8	0.533	262	8	2010
Incontinence						
Element	H index	G index	M index	TC	NP	PY→start
SCHNELLE JF	40	57	0.952	3458	70	1983
OUSLANDER JG	35	54	0.814	3097	66	1982
BLISS DZ	21	36	0.840	1349	44	2000
GRODSTEIN F	21	39	0.955	1706	39	2003
NORTON C	21	38	0.778	1546	52	1998
RESNICK NM	20	26	0.690	1327	26	1996
SIMMONS SF	20	29	0.625	1156	29	1993
PALMER MH	18	33	0.529	1115	44	1991
TOWNSEND MK	18	24	0.947	1126	24	2006

NP: Number of publication; PY-start:publication year; TC: Total citation

Keywords plus top trending topics

WoS records contain 2 types of keywords, namely, author keywords and keyword plus. Keyword plus refers to words or expressions that are created by an automatic computer algorithm, often seen in reference titles of an article or not seen as author keywords. The study analysed by keyword plus. In the nursing literature, wound-related research is mostly focused on care, management and prevention; Research on ostomy: quality of life, surgery and stoma; Research on incontinence focused on prevalence, urinary incontinence and quality of life. Care, quality of life and impact were common topics in wound, ostomy and incontinence research As a result of the analysis, gaps in the literature and topics with a lack of publications were identified. The lack of publications in the wound care literature are related to "ostomy, intensive care management, diabetes, chronic

wounds, burns, quality of life, evidence-based practice, surgical wound infection, incidence". Ostomy nursing literature focuses on "experience, self-efficacy, long-term outcomes, adaptation, successful recovery, risk management, evidence-based practice". Incontinence nursing literature; prostate cancer, stress urinary incontinence, qualitative study, prevention, pressure injuries, nursing care, pelvic organ prolapse, overactive bladder" (Figure 2).

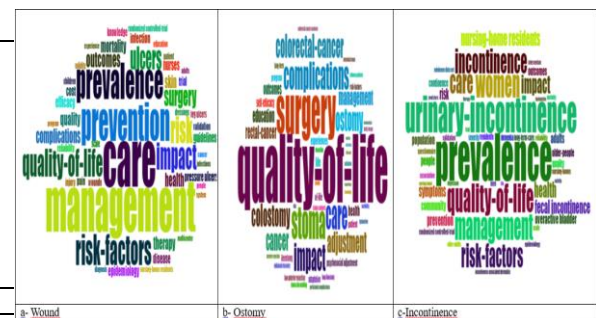


Figure 2. Word cloud by keyword plus

Geographical and institutional distribution and collaboration

It shows that there is significant development on the issue in different countries, as shown by the common dark blue colour in Figure 5. Light blue colours indicate that the issue has been addressed less, and in countries shown in grey, the issue has not yet been addressed (Figure 3). Looking at the top five countries producing nursing publications on this topic; for wounds USA (8393), Australia (3440), China (3286), UK (2545), Japan (2101); for ostomy USA (689), China (304), UK (135), Turkey (127), Brazil (125); for incontinence Italy (745), Ireland (622), Netherlands (594), Sweden (593), Turkey (52) (Figure 3). Global collaborations in the nursing literature related to wounds, ostomy and incontinence were examined. The collaborations for wounds were as follows: Australia- UK (206), USA- Canada (166), USA - UK (136), UK - Ireland (115) and Australia - Ireland (112). Ostomy collaborations were as follows: USA- Canada (8), China - UK (7), UK - Australia (5), Australia - Singapore (3), China-Spain (3). For incontinence, collaborations were as follows: USA-UK (48), UK-Australia (47),

USA-Canada (47), UK-Netherlands (35), USA-China (33).

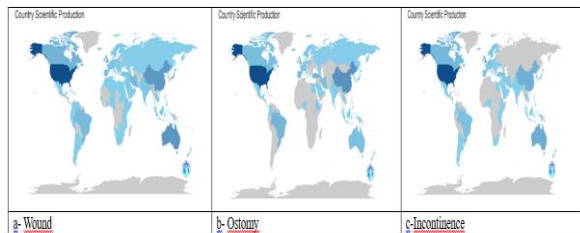


Figure 3. Country scientific map

The increase in the production of publications on related topics is leading publications to focus on deeper and more original fields.⁵ While this makes it easier to understand the issues and track their development, it makes it more difficult to replace outdated or obsolete information with new and up-to-date information.⁴⁰ It is therefore necessary to update existing knowledge and integrate new knowledge in academic and applied fields.⁴¹ Bibliometric studies are an important tool for understanding and adapting to changes in the scientific literature. These studies are an indispensable source for accessing current information in academic and clinical practice, using this information effectively, and identifying gaps in the literature.^{30,35,42}

There are many interdisciplinary bibliometric studies on WOC in the literature.^{10,12,13,15,17,18,20,21,24} However, to our knowledge there is no bibliometric study on incontinence in nursing. Bibliometric studies in the field of nursing, specific to wounds⁹ and ostomy¹⁹ are limited. These studies in both fields have certain subject, data and analysis limitations. The subject limitation is that the wound study only analysed publications on pressure injuries, whereas the ostomy study analysed qualitative publications containing patient experiences. The date limitation stems from the fact that both studies set a date limit and only analysed studies published on these dates. The analysis limitation stems from the lack of citation analysis in both studies. The literature emphasises the critical importance of citation analysis, which is used in bibliometric analyses to assess the academic impact of

researchers and countries in a specific field.
5,6,31,40,43-45

This bibliometric and visualised study analyses in detail the characteristics of a wide range of WOC nursing publications, highlighting research trends, global situations and landmarks. Specifically, the study examines the quantitative and qualitative characteristics of publications in the field of WOC nursing, visually revealing which topics stand out and which countries, institutions, journals and authors are pioneers in the field. This bibliometric study is important in that it contributes to the field from a global perspective by deepening knowledge in the field of WOC nursing and providing a roadmap for future research and practice. In addition, the fact that it is the first comprehensive bibliometric study in this field increases the importance of the study. The results of the study can help both academics and clinical practitioners to make strategic decisions and plan future research and practice.

Publication output and growth trend

The first publications in all three fields of WOC nursing publications occurred between 1974-1975, publication production increased between 2003-2005, and publication production reached its peak in 2022-2023. Such a development profile indicates that all three fields of nursing are becoming increasingly influential. This shows that WOC nursing practice is becoming more important and the scientific literature in this area is increasing. In addition, when the production of nursing publications in the three fields is evaluated, the production of publications related to wounds is higher. In parallel with this finding, the literature shows that there are many interdisciplinary bibliometric studies on wounds, focusing on different approaches to wound care management.¹⁰⁻¹⁸ However, despite the high production of publications, there is only one bibliometric study in nursing.⁹ All bibliometric studies on incontinence are interdisciplinary and related to urinary incontinence.²¹⁻²⁴ Bibliometric studies on ostomy are limited in number.^{19,20} This study identified a lack of literature on nursing

bibliometric studies on incontinence and interdisciplinary and nursing bibliometric studies on fecal incontinence and ostomy.

Journals publishing articles on WOC nursing

The study's analysis of Bradford's Law describes WOC as the most productive group of journals in nursing literature. Bradford's Law is a bibliometric method used to analyse the distribution of scientific literature among journals.^{46,47} This approach aims to identify which journals focus on articles published on a particular topic and the productivity levels of these journals.⁴³ This law divides journals on a subject into three main zones. Each zone is considered a unit containing the same number of articles, and journals are ranked according to their productivity within these units. The first zone contains the group of journals that publish the most articles on the topic and are the most productive. These are the journals that have the greatest impact on a particular topic in the literature and tend to publish the most recent research. The other zones contain journals that publish as many articles as those in the first zone, but are more numerous and less productive. Journals in the second zone, although not as influential as those in the first zone, still contribute a significant amount of literature. Journals in the third zone are generally less productive. Using Bradford's Law, researchers can identify the most important journals on a particular topic and their place in the literature.^{46,48} This method provides an objective assessment for classifying journals in the literature and determining their importance. Bibliometric measures such as literature obsolescence, half-life and impact factor are other parameters often used in these analyses as they provide additional information on the quality and impact of journal publications.^{46,47}

Bradford's Law allows us to identify the most relevant sources by number of publications.^{46,47} It was found that the majority of nursing articles related to Bradford Law WOC care were published in the Journal of Wound Ostomy and Continence Nursing (Table 2). Other bibliometric studies

on ostomy have also identified the Journal of Wound Ostomy and Continence Nursing as a specialist journal.^{19,20} Capilla-Diaz et al reported in their study that, contrary to the findings of this study, the other most relevant journals were nursing journals.¹⁹ This may be because the study in question did not use an analysis of Bradford's Law or because nursing journals have a higher tendency to publish qualitative studies. Clarification of this information can be achieved by conducting a more comprehensive analysis of a bibliometric study that includes qualitative nursing studies on ostomy care. It is expected that studies focusing on Wound, Ostomy and Continence (WOC) care management in nursing will be published in a nursing journal that focuses predominantly on collaborative specialisation. However, WOC nursing studies received more attention in multidisciplinary journals than in nursing journals.

Current literature indicates that WOC care management can be complex and to achieve good patient outcomes and provide high quality care, wound,^{49,50} ostomy^{51,52} and incontinence^{53,54} emphasise the importance of a multidisciplinary team.

Authors and collaboration

WOC nursing publications do not follow Lotka's Law in all wound, ostomy and incontinence publications. Lotka's Law is in one field; it states that authors with one article must contribute 60%, authors with two articles 15% and authors with three articles 7%.⁵⁵ Looking at publication production in all three fields of WOC nursing publications, the percentages of authors contributing one article to publication production are very close and high. Even the percentages of authors contributing two articles in all three fields are low. This shows that the number of authors who publish in these fields is high and most of them do not even produce a second article. Similar to the results of this study, one study pointed out the high percentage of authors who contributed to the production of publications with one article.¹⁹

The number of experts and the publication of application results by experts are important

for the development of a field and the reflection of the application literature. According to Lotka's Law, authors with more than five publications in a field are considered to have deepened their knowledge in the field and these authors are considered to be core authors.²⁹ In this study, although the publication production of wounds was quantitatively higher than that of the other two fields, it was found that the contribution of core authors to the publication production of all wound, ostomy and incontinence fields was very close (1.5%, 1.4% and 1.9%, respectively). The percentage of core authors is higher for authors publishing on incontinence, as the production of publications in this field means that incontinence authors have more depth on the subject. Lotka's Law provides the opportunity to determine how many articles authors have contributed to a particular literature, and thus to quantitatively predict how many articles authors may contribute to that literature in the future. In fact, when looking at the results of bibliometric studies published in all three fields, two studies on incontinence^{21,22} and one study on ostomy¹⁹ mentioned authors with at least five articles, but Lotka's law analysis was not performed in these studies. Lotka's law analysis is of great importance for future bibliometric studies.

In the citation analysis carried out in the study, the most cited authors are Sanada H (3924) in wound care, Grant M (1288) in ostomy and Schnelle JF (3458) in incontinence. In the literature, citation analysis was performed for the authors of only two bibliometric studies on incontinence^{23,24}. The most cited author in these studies is different from both these studies and our study. The reason for these different results is that one of the incontinence studies is only about urinary incontinence²⁴ and the other is about stress incontinence with a time limit.²³ The most cited author in these studies is different from both these studies and our study. The reason for these different results is that one of the incontinence studies is only on urinary incontinence and the other is on stress incontinence with a time limitation. Although an author citation analysis was not performed,

Grant M. is the author with the most publications in the bibliometric study on ostomy care, parallel to the results of our study.¹⁹

Keywords plus top trending topics

Keywords plus refers to words or phrases generated by an automatic computer algorithm that frequently appear in the titles of an article's references and do not appear in the title of the article or as author keywords.⁵³ This analysis provides insight into research trends.⁵⁴ WOC nursing literature, wound-related care, management and prevention; ostomy-related quality of life, surgery and ostomy; for incontinence, there is a greater tendency towards prevalence, urinary incontinence and quality of life issues. Nursing care, quality of life and impact are common themes in WOC nursing research. Wound,^{9,10,13,17,18} with ostomy^{19,20} and incontinence^{23,24} related bibliometric studies have benefited from keyword analysis. Bir çalışma keyword analizi yaklaşımını çalışmasının sınırlılığı olarak vurgulamıştır.⁹ "Prevention and care" in Azizoglu and Terzi's pressure injury study⁹ and "urinary incontinence" in Wu et al.'s stress incontinence study,²³ parallel to our study, were among the most studied topics. There was no keyword or keyword plus analysis in bibliometric studies on ostomy.^{19,20} As a result of the analysis, gaps in the literature and topics with a lack of publications were identified. The lack of publications in the wound care literature relates to 'ostomy, intensive care management, diabetes, chronic wounds, burns, quality of life, evidence-based practice, surgical wound infection, incidence'. Ostomy nursing literature; "experience, self-efficacy, long-term outcomes, adaptation, successful recovery, risk management, evidence-based practice". Incontinence nursing literature; "prostate cancer, stress urinary incontinence, qualitative study, prevention, pressure injuries, nursing care, pelvic organ prolapse, overactive bladder".

Geographical and institutional distribution and collaboration

In parallel with the results of bibliometric studies in the literature, in our study, the

country that produces the most publications on wounds is the USA.^{9,11} Contrary to the results of the study, most of the collaborations in the literature are between the USA and China^{11,18}. It can be seen that country cooperation in interdisciplinary studies differs from country cooperation in nursing studies. Bibliometric studies in the literature report that, similar to the study literature, the USA and China are among the top five countries in the production of wound-related publications.^{10,11,17,18} This finding is consistent with the results of our study.

In the study, the countries with the most publications on ostomy care are the USA, China, the UK, Turkey and Brazil. While Brazil was ranked first in the Capilla-Diaz et al. study, it is ranked fifth in this study. The reason for this discrepancy may be that this study focuses only on the analysis of qualitative studies and covers a specific time period.¹⁹ In the study, most of the collaborations were between the USA and Canada. No collaboration analysis was performed in bibliometric studies on ostomy literature.^{9,19}

The study found that most nursing publications on incontinence were produced in Italy. It was reported in third place in one of the Italian interdisciplinary incontinence studies.²⁴ In our study, the most common publishing collaboration is between the USA and the UK. In addition, intensive publishing collaboration was found between the USA and Canada and China. One study reported that publication cooperation is concentrated among European countries.²³ In our study results, we have identified publishing cooperation between the UK and the Netherlands, one of the European countries.

The study found that WOC publications are discussed more in developed countries, but not at all in some less developed countries. This may be due to the high level of financial support that countries provide to researchers and/or the economic, technological and educational advantages of developed countries. In parallel, it can be said that the implementation of the protocol in these countries is uncertain, especially due to the

lack of publications in some underdeveloped countries. There is a clear gap in the literature regarding the outcomes of WOC care studies, especially in underdeveloped countries. Publication collaborations can be interdisciplinary, multidisciplinary, national and international.⁵⁵ Collaboration took place between developed countries. Collaboration between researchers can help share knowledge, resources and ideas, and learn new skills and practices.⁵⁶ These collaborations can therefore help to create innovative applications and increase research.²⁸ Multi-centre and international health research is valuable in identifying the most effective practices and implementing evidence-based practices, which requires collaboration between countries and institutions.⁵⁷ Researchers may conduct national or international collaborative studies, and it is particularly important to conduct studies that assess the situation in underdeveloped and developing countries.

Strengths and Limitations

The strengths of this study are that it is the first comprehensive bibliometric analysis of the field of WOC nursing, focusing on nursing publications related to wound, ostomy and incontinence (1), revealing the common and different characteristics of publications related to these three specific fields of WOC nursing (2), analyses using keyword plus, Lotka and Bradford laws (3) and selecting literature from WOS (Web of Science), one of the most reliable databases (4). The limitations of the study are; the choice of another database may lead to different results, as nursing studies in this field are published in journals that are not indexed in WOS (1), and the analyses include only articles and review articles.

Conclusion

This bibliometric study provided comprehensive information on global trends and milestones in wound, ostomy and incontinence research, three specific fields of WOC nursing literature. It also identified common and different aspects of the literature across these three specific fields of WOC nursing. The results of this study showed that

the number of publications in WOC nursing increased each year and peaked early in the publication of the three specialties. It was found that of the three specialties, most publications were related to wound care, according to the Bradford Law analysis, the most productive journals were in the first specialty related to incontinence care, and multidisciplinary journals were also in the core group of journals for these specialty nursing publications. It turns out that not all of these fields follow Lotka's law for writer productivity. It was shown that the number of specialist writers who specialise in all three fields should be increased. Developed countries were the most productive countries for WOC nursing literature and publication collaborations were concentrated in these fields. In some of the less developed countries there were no publications at all. This study used keyword plus analysis to identify gaps in the literature in three fields. As keyword plus

analysis analyses not only the relevant publication but also the topics of the publications citing that publication, this study provided a detailed analysis for these three fields and offered the opportunity to evaluate them from a broader perspective. At the same time, the lack of a bibliometric study of incontinence nursing in the literature and the identified limitations of the wound and incontinence nursing literature and interdisciplinary bibliometric studies of these three fields showed the importance of this study.

According to the results of this study, future studies should deepen the literature in this field, increase the number of publications and, in parallel, increase the number of journals in the core journal group and the number of authors who are experts in their field. This study will provide an overview of the literature on WOC nursing.

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