

Web of Science-based analysis of the Journal of Human Lactation: An example of bibliometric analysis in nursing

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ABSTRACT

This study was conducted in order to examine the characteristics of the studies published in the Journal of Human Lactation (JHL) between 2010-2020 and the development of the journal from a general bibliometric perspective. The journal reached its 36th year of publishing in 2021. By using bibliometric techniques, we analyze the JHL's impact, its prominent topics, citation rate, and its most prolific authors, including their affiliated institutions and countries. We use VOS viewer software to visualize the mapping of JHL based on co-citation, bibliographic coupling (BC), and co-occurrence (CC). By using the keyword "Journal of Human Lactation" in the Web of Science database, 766 articles covering the years 2010-2020 were reached. In the study, in which bibliometric analysis method was used, studies with an unknown author were not included in the analysis, and the study was completed with 752 articles. As a result according to the bibliometric review of the JHL journal, the annual number of publications is at most 98, and the h index and citation numbers were high. In this study, the most influential aspects and development of JHL are explained, and information is provided to the literature, readers, and authors to comprehend the journal's focus and developmental process.

Keywords: *bibliometrics, VOSviewer, journal of human lactation, nursing*

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Web of Science Tarafından Takip Edilen Human Lactation Dergisi: Hemşireliğe Ait Bir Bibliometrik Analiz Örneği

ÖZ

Bu çalışma, Journal of Human Lactation (JHL) dergisinde 2010-2020 yılları arasında yayınlanan makalelerin özelliklerini ve derginin gelişimini genel bibliyometrik bir bakış açısıyla incelemek amacıyla yapılmıştır. Dergi, 2021 yılında 36. yayın yılına ulaştı. JHL'nin etkisini, öne çıkan konularını, atıf oranını, en üretken yazarlarını, bağlı oldukları kurumları ve ülkeleri bibliyometrik teknikler kullanarak analiz edildi. Ortak alıntı, bibliyografik bağlantı (BC) ve birlikte oluşum (CC) temelinde JHL eşleşmesini görselleştirmek için VOS görüntüleyici yazılımı kullanıldı. Web of Science veri tabanında “Journal of Human Lactation” anahtar kelimesi kullanılarak 2010-2020 yıllarını kapsayan 766 makaleye ulaşıldı. Bibliyometrik analiz yönteminin kullanıldığı çalışmada yazarı belli olmayan çalışmalar analize dahil edilmedi ve çalışma 752 makale ile tamamlandı. Sonuç olarak yapılan bibliyometrik incelemeye göre JHL dergisinin yıllık yayın sayısının en fazla 98 olduğu, h indeksi ve atıf sayılarının yüksek olduğu belirlendi. Bu çalışmada JHL'nin en etkili yönleri ve gelişimi açıklanmış, literatüre, okuyuculara ve yazarlara derginin odak noktası ve gelişim sürecini kavramaları için bilgi verilmiştir.

Anahtar kelimeler: *bibliometri, VOSviewer, insan laktasyon dergisi, hemşirelik*

GİRİŞ

Bibliometry is used to obtain new information by providing macroscopic and microscopic analysis of many publications (research and review articles, conference papers, books, book chapters, notes, letters, typos, etc.) (Kokol & Blažun Vošner, 2019). Bibliometric analysis can identify the most productive authors, institutions, countries and journals within scientific disciplines, analyze literature dynamics, models of communication and collaboration between authors, and examine its history and structure (De Bellis, 2009; Kokol & Blažun Vošner, 2019; Kokol et al., 2017). In addition to this, this method also enables the identification of existing gaps in research disciplines or research subjects (Hall et al., 2018).

Journal of Human Lactation (JHL) is an international multi-disciplinary peer-reviewed journal published once every three months. JHL publishes original

research on breastfeeding and lactation, original theoretical and conceptual articles, and controversial issues related to clinical practice and policy. Its executive editor is Joan E. Dodgson from Saint Louis University. The journal was founded in 1985 and published by SAGE Publications (Clarivate Analytics, 2019). JHL is the official publication of the International Lactation Consultant Association. JHL, the first scientific journal focusing specifically on breastfeeding, has an important place in breastfeeding and in the professionalization of breastfeeding support (Hoover et al., 2019). According to the Thomson Reuters Journal Citation Reports, which measures the frequency with which the ‘average article’ in a journal has been cited in a particular year or period (Thomson Reuters, 1994), JHL had an impact factor of 2.205 in 2019 (Mandal , 2020). The indexes in which the journal is registered are as follows in alphabetical order: CAB Abstracts Database, CABI: Abstracts on Hygiene and Communicable Diseases, CABI: Dairy Science Abstracts, CABI: Global Health, CABI: Nutrition Abstracts and Reviews Series A, CABI: Tropical Diseases Bulletin, CINAHL, Clarivate Analytics: Science Citation Index Expanded (SCIE), Combined Health Information Database (CHID), EMBASE / Excerpta Medica, Food Science and Technology Abstracts, InfoTrac (full text), International Nursing Index, MEDLINE, Nutrition Abstracts and Reviews, Ovid: Allied and Complementary Medicine Database, Review of Medical and Veterinary Mycology, Rural Development Abstracts, Science Citation Index Expanded (Web of Science), Scopus.

JHL has been found worth conducting a bibliometric analysis study since it publishes quality studies in the field of breastfeeding and lactation, and is one of the most respected journals in its field. This study was conducted in order to examine the characteristics of the studies published in the Journal of Human Lactation (JHL) between 2010-2020 and the development of the journal from a general bibliometric perspective. While sending the results of the study to the Journal of Human Lactation, the authors will be able to recognize the profile of the journal and inform the authors about the journal.

The following questions were addressed within the scope of the study:

- What is the type and citation nature of studies published in JHL?
- What are the author characteristics of the studies published in JHL?
- What are the author keywords in the studies published in JHL?
- What is the distribution of the studies published in JHL by years?
- What is the distribution of the studies published in JHL by country?

METHODS

Design

This study used a bibliometric analysis, a technic that has been progressively used as a tool and basis for monitoring research performance of various scientific disciplines and journals as well as supporting appropriate policy actions. Bibliometry is a quantitative tool used to analyze bibliographic data and has gained a reputation for its applications in various fields (Ellegaard & Wallin, 2015). Databases, such as Web of Science, Google Scholar, PUBMED, Scopus and EMBASE are used. While Web of Science, Scopus and Google Scholar cover all disciplines, PUBMED and EMBASE only cover scientific data in medical sciences (Burmaoğlu et al., 2016; Khare et al., 2014). In our study, keywords, citation analysis, impact factor, article types, distribution of studies by years, institutions and authors that submitted the highest number of publications were analyzed using bibliometric analysis. The study design is shown in Figure 1.

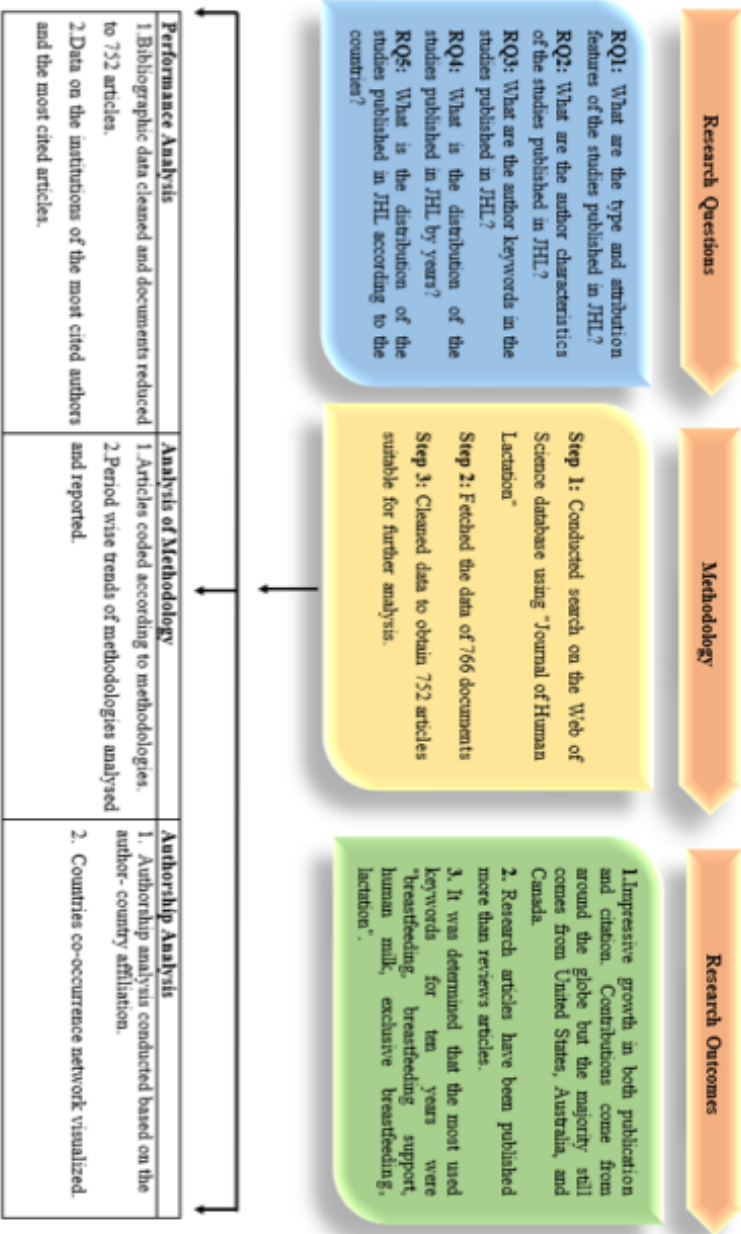


Figure 1. Research design of the study

Collection of Research Data

In order to arrive at information pertinent to this study, data were retrieved from the Web of Science core collection platform by Clarivate analytics, which is the world's premier database for published articles and citations. The characteristics of the articles published in the Journal of Human Lactation between 2010 and 2020 were recorded in the data collection form. While determining the number of citations of the publications, the number of citations received by the articles in Web of Science on 31.12.2020 was used. "Journal of Human Lactation" was the keywords used to look for research abstracts, titles and keywords in the database. As a result of surveying, 766 articles covering the years 2010-2020 have been reached. In the study, in which bibliometric analysis method was used, studies with an unknown author were not included in the analysis and the study was completed with 752 articles. Along with the editorials, the articles in press and those published in 2021 were excluded (as our analysis was restricted up to 2020) for a result of 752 documents.

Data analysis

Bibliometric analysis method was used to evaluate the data. The data obtained on Publication trends and citation network were analyzed by using the Excel program. Number and percentage were used in the analysis of the data. VOSviewer program was used to visualize the network structure of keywords. This is based on the "visualization of similarities" (VOS). Citation, co-citation and keyword analysis have been performed through the VOS viewer. VOSviewer is a tool often used to create bibliometric networks of different items such as authors, institutions or countries using various network analysis methods such as common citation, keyword, and bibliographic matching (Van Eck & Waltman, 2010). The program provides a viewing opportunity that enables bibliometric maps to be examined in full detail and has zoom, pan and search functions that facilitate detailed examination of the map (Van Eck & Waltman, 2010).

RESULTS

General publication profile of JHL

When analyzed in terms of publication, it was determined that 752 articles scanned from Web of Science were published between 2010 and 2020, 695 of these articles (%92.42) were research articles and 57 of them (7.58%) were reviewed articles (Figure 2).

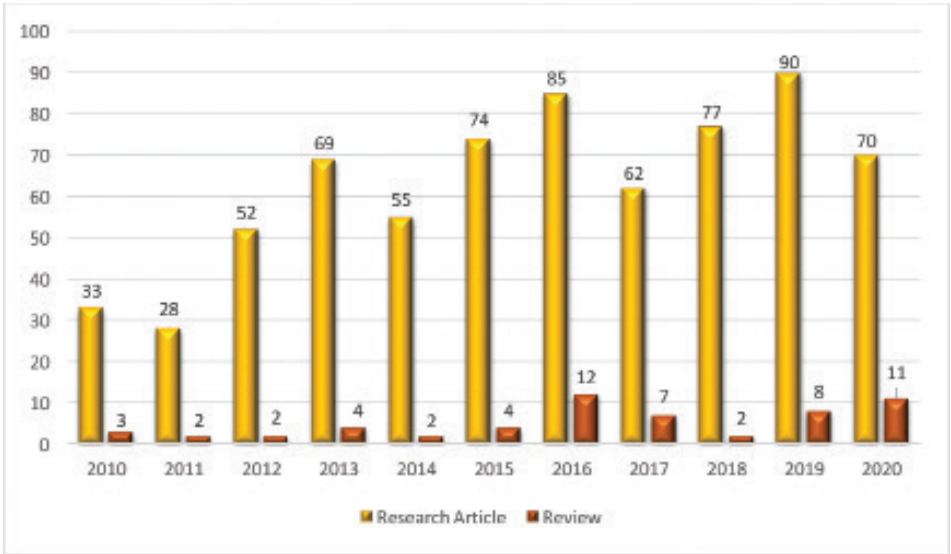


Figure 2. Publication numbers by years

When Figure 2 is examined, it was found that the most research articles were published in 2019, and the review articles were published in 2016 in JHL journal. It was observed that the number of both research and review articles published in the journal decreased in 2011 compared to other years. Of the 44 issues published by the magazine between 2010 and 2020, two issues were published in 2013 and 2015, and one special issue in 2018. Issues named “Breastfeeding Down Under”, “Breastfeeding and Human Milk in Neonatal Intensive Care”, “Equity in Breastfeeding “,” Special Issue on a CDC Initiative to Improve Community-Based Support for Breastfeeding “and” Social Justice and Lactation “ were published as special issues. In special issues that are published, it is focused on lactation and breastfeeding.

Impact factor depends on the frequency of citation of articles published in a journal and is an indicator that determines the quality of the journal (Saha et al., 2003). The impact factor of the Journal of Human Lactation magazine fluctuates over the years. The year with the highest impact factor is 2019, and the journal’s impact factor does not appear to be above two until 2019 (Figure 3).

The number of citations of articles published in JHL journal by years is given in Figure 3. When the citation status of the articles published in the journal was examined, 649 (86.30%) articles were cited between 2010 and 2020, while 103 (13.70%) articles were not cited at all. Considering the number of citations of the journal, it was determined that the number of citations increased over the years and the journal was cited the most in 2020. At the time of the citation review, it was determined that the total number of citations of the journal was 7771.

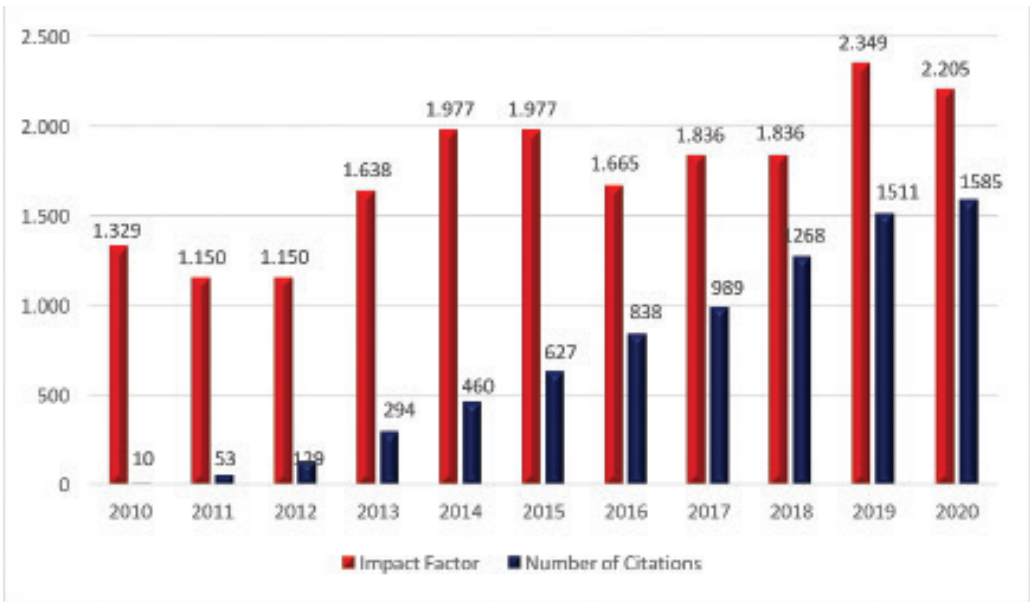


Figure 3. Impact factor and number of citations by years

The most cited JHL articles, top authors affiliated institutions and countries

Information about the articles published in the Journal of Human Lactation, which received 50 or more citations, is given in Table 1. It has been determined that there are 18 studies with 50 or more citations in the journal, the studies were mostly published in 2013 and the most cited publication with 168 citations was the research article titled “Sharing of bacterial strains between breast and infant feces” published in 2012 by Martín et al. Table 1.). The journal’s h index was calculated as 35.

Table 1. 50 and More Cited Publications Published in the Journal of Human Lactation

No	Article Details	Number of citations	Country	Organizations
1	Martín, V., Maldonado-Barragán, A., Moles, L., Rodríguez-Baños, M., Campo, R. D., Fernández, L., ... & Jiménez, E. (2012). Sharing of bacterial strains between breast milk and infant feces. <i>Journal of Human Lactation</i> , 28(1), 36-44. (Martín et al., 2012)	168	Spain	Complutense University of Madrid University
2	Bramson, L., Lee, J. W., Moore, E., Montgomery, S., Neish, C., Bahjri, K., & Melcher, C. L. (2010). Effect of early skin-to-skin mother—Infant contact during the first 3 hours following birth on exclusive breastfeeding during the maternity hospital stay. <i>Journal of human lactation</i> , 26(2), 130-137. (Bramson et al., 2010)	98	USA	Loma Linda University
3	Nyqvist, K. H., Häggkvist, A. P., Hansen, M. N., Kylberg, E., Frandsen, A. L., Maastrup, R., ... & Haiek, L. N. (2013). Expansion of the baby-friendly hospital initiative ten steps to successful breastfeeding into neonatal intensive care: expert group recommendations. <i>Journal of Human Lactation</i> , 29(3), 300-309. (Nyqvist et al., 2013)	95	Sweden	Uppsala University Hospital

4	Jiménez, E., de Andrés, J., Manrique, M., Pareja-Tobes, P., Tobes, R., Martínez-Blanch, J. F., ... & Rodríguez, J. M. (2015). Metagenomic analysis of milk of healthy and mastitis-suffering women. <i>Journal of Human Lactation</i> , 31(3), 406-415. (Jiménez et al., 2015)	93	Spain	Complutense University of Madrid University
5	Chapman, D. J., Morel, K., Anderson, A. K., Damio, G., & Pérez-Escamilla, R. (2010). Breastfeeding peer counseling: from efficacy through scale-up. <i>Journal of Human Lactation</i> , 26(3), 314-326. (Chapman et al., 2010)	88	USA	University of Connecticut
6	Rempel, L. A., & Rempel, J. K. (2011). The breastfeeding team: the role of involved fathers in the breastfeeding family. <i>Journal of Human Lactation</i> , 27(2), 115-121. (Rempel & Rempel, 2011)	82	Canada	Brock University
7	Hassiotou, F., Geddes, D. T., & Hartmann, P. E. (2013). Cells in human milk: state of the science. <i>Journal of Human Lactation</i> , 29(2), 171-182. (Hassiotou et al., 2013)	81	Australia	University of Western Australia
8	Maycock, B., Binns, C. W., Dhaliwal, S., Tohotoa, J., Hauck, Y., Burns, S., & Howat, P. (2013). Education and support for fathers improves breastfeeding rates: a randomized controlled trial. <i>Journal of Human Lactation</i> , 29(4), 484-490. (Maycock et al., 2013)	78	Australia	Curtin University

9	Agarwal, S., Karmaus, W., Davis, S., & Gangur, V. (2011). Immune markers in breast milk and fetal and maternal body fluids: a systematic review of perinatal concentrations. <i>Journal of Human Lactation</i> , 27(2), 171-186. (Agarwal et al., 2011)	76	USA	University of South Carolina
10	Casadio, Y. S., Williams, T. M., Lai, C. T., Olsson, S. E., Hepworth, A. R., & Hartmann, P. E. (2010). Evaluation of a mid-infrared analyzer for the determination of the macronutrient composition of human milk. <i>Journal of Human Lactation</i> , 26(4), 376-383. (Casadio et al., 2010)	76	Australia	University of Western Australia
11	Bai, Y., Middlestadt, S. E., Peng, C. Y. J., & Fly, A. D. (2010). Predictors of continuation of exclusive breastfeeding for the first six months of life. <i>Journal of Human Lactation</i> , 26(1), 26-34. (Bai et al., 2010)	75	New Jersey	Montclair State University
12	Khan, S., Hepworth, A. R., Prime, D. K., Lai, C. T., Trengove, N. J., & Hartmann, P. E. (2013). Variation in fat, lactose, and protein composition in breast milk over 24 hours: associations with infant feeding patterns. <i>Journal of Human Lactation</i> , 29(1), 81-89. (Khan et al., 2013)	63	Australia	University of Western Australia

13	Mirkovic, K. R., Perrine, C. G., Scanlon, K. S., & Grummer-Strawn, L. M. (2014). Maternity leave duration and full-time/part-time work status are associated with US mothers' ability to meet breastfeeding intentions. <i>Journal of Human Lactation</i> , 30(4), 416-419. (Mirkovic et al., 2014)	59	USA	Centers for Disease Control & Prevention
14	Brockway, M., Benzies, K., & Hayden, K. A. (2017). Interventions to improve breastfeeding self-efficacy and resultant breastfeeding rates: a systematic review and meta-analysis. <i>Journal of Human Lactation</i> , 33(3), 486-499. (Brockway et al., 2017)	54	Canada	University of Calgary
15	Patel, A., Banerjee, A., & Kaletwad, A. (2013). Factors associated with prelacteal feeding and timely initiation of breastfeeding in hospital-delivered infants in India. <i>Journal of Human Lactation</i> , 29(4), 572-578. (Patel et al., 2013)	53	Philadelphia	University of Pennsylvania
16	Mortel, M., & Mehta, S. D. (2013). Systematic review of the efficacy of herbal galactogogues. <i>Journal of Human Lactation</i> , 29(2), 154-162. (Mortel & Mehta, 2013)	51	Chicago	The University of Illinois

17	Semenic, S., Childerhose, J. E., Lauzière, J., & Groleau, D. (2012). Barriers, Facilitators, and Recommendations Related to Implementing the Baby-Friendly Initiative (BFI) An Integrative Review. <i>Journal of Human Lactation</i> , 28(3), 317-334. (Semenic et al., 2012)	51	Canada	McGill University
18	Clemons, S. N., & Amir, L. H. (2010). Breastfeeding women's experience of expressing: a descriptive study. <i>Journal of Human Lactation</i> , 26(3), 258-265. (Clemons & Amir, 2010)	50	Australia	La Trobe University

When the institutions and countries of the most cited articles were examined, it was determined that the articles published in the University of Western Australia and the publication country of the journal, the United States of America, received more citations (**Figure 4**).



Figure 4. Institutions of the most cited authors

Authorship analysis

In order to arrive at information pertinent to this study, data were retrieved from It was determined that 752 articles included in the study were written by 2604 authors and the number of authors per article was 3.46. The number of authors of the articles published in the journal varies between 1-13. 10.37% of the publications had a single author, 13.83% had two authors, 17.82% had three authors, 15.43% had four, 14.89% had five, 11.84% had six, 7.58% by seven, 3.59% by eight, 2.39% by nine and 2.26% by ten or more authors. Anne Merewood (14 publications), Riccardo Davanzo (11 publications), Peter E. Hartman (11 publications) and Donna T. Geddes (11 publications) were found to have ten or more publications between the dates of the review (**Figure 5**.)

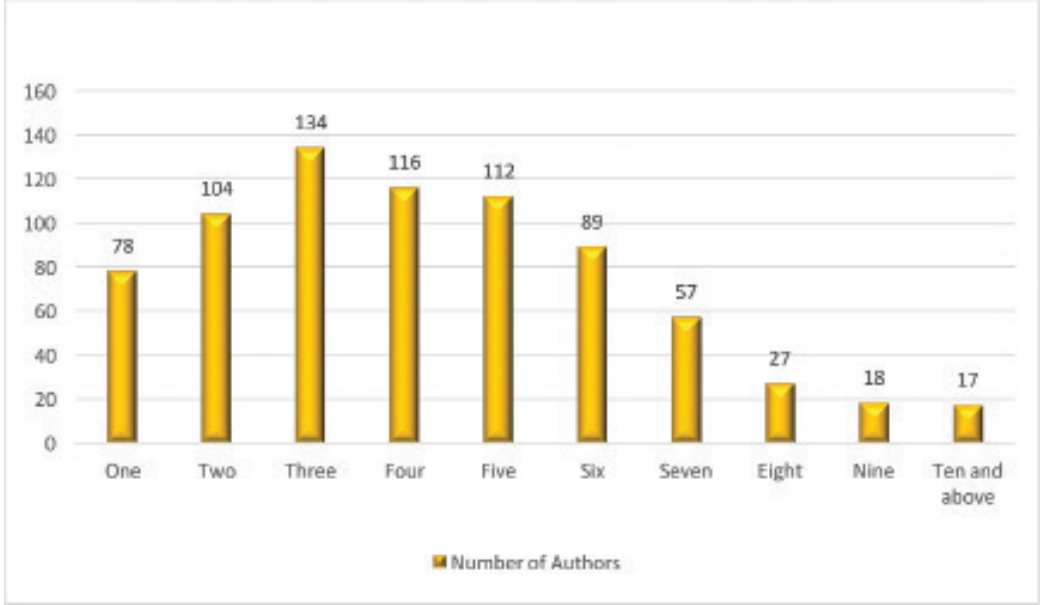


Figure 5. Number of authors

A total of 1281 author keywords were used in the articles published between 2010 and 2020 in the Journal of Human Lactation. The most used author keywords were determined as “breastfeeding (648)”, “breastfeeding support (108)”, “human milk (88)”, “exclusive breastfeeding (71)” and “lactation (71)”. Keywords are determined by the authors and indicate which author keywords are used more frequently, how they are linked and when they are used (Železnik et al., 2017). It is stated that the larger the circles and character fonts, the more frequently the author keywords are used, the smaller the circles and character fonts, the less keywords are used (Figure 6).

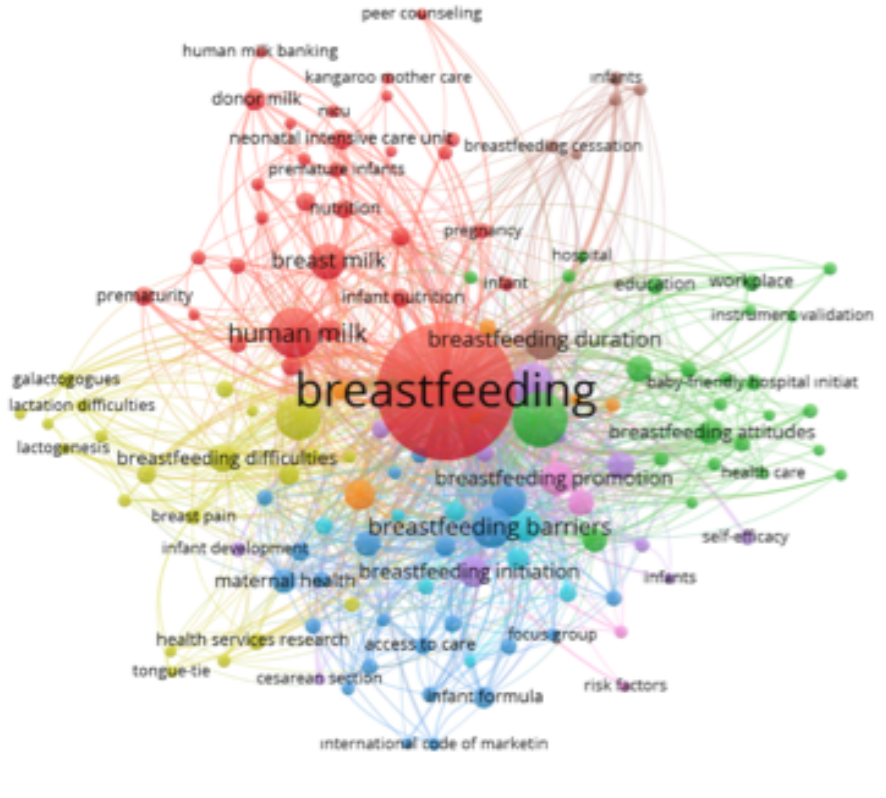


Figure 6. Author keywords co-occurrence network

Of the 752 studies included in the review, it was determined that 57% (429 publications) were from the United States, 9.57% (72 publications) were from Australia, 7.98% (60 publications) were from Canada and 25.45% were sent from other countries (Figure 7).



Figure 7. Countries co-occurrence network

DISCUSSION

Journal of Human Lactation magazine, which has been published since 1985, is published four times a year in February, May, August and November. It was determined that the published articles were 92.42% research and 7.58% review articles. In the bibliometric analysis of the Journal of Advance Nursing, it was found that 83.54% of the analyzed studies were also research articles (Železnik et al., 2017). This finding shows that journals are open to new and up-to-date information and that they were published.

The number of articles published in the Journal of Human Lactation has started to increase since 2012 and it has been determined that the highest number of publications is in 2019. Similarly, in the bibliometric analysis of the articles published in the International Journal of Nursing Studies between 1963-2018, İmani et al. (2019) stated that the number of articles continued to increase every year and the highest number of articles was in 2018. In the bibliometric analysis of the Journal of Nursing Management between 1993 and 2018, the number of

articles increased rapidly after 2008, reaching 119 articles in 2019 (Yanbing et al., 2020). With the rapid advancement of technology and science, the worldwide visibility of journals has increased and it is thought that the number of articles published in the journal has increased as this progress has caused the number of articles to increase rapidly over the years.

The impact factor used in measuring the effectiveness of scientific journals is defined as the number of citations per article in a journal (Garfield, 2006; Önalın, 2013). Since citations to previous issues of scientific journals may not reflect the current impact of the journal, when calculating the impact factor value of a journal, the articles published in the issues of the journal one and two years ago and the references to these articles are taken into account (Asan, 2004). Although the impact factor of the Journal of Human Lactation shows fluctuations, it is observed that it increases and decreases in parallel with the number of articles over the years. The year with the highest impact factor is 2019, is the year in which the journal published the most articles.

Citations are considered as important building blocks for status and success in science (Nielsen & Andersen, 2021). When we look at the 10-year citation analysis of the Journal of Human Lactation, it was determined that the most citations were in 2020, the least cited in 2010, and the number of citations increased every year. In the bibliometric analysis study by Kantek and Yeşilbaş (2020) covering 38 different nursing journals between 1974 and 2019, it was determined that there were fluctuations in the number of citations, but the number of citations increased despite fluctuations and the highest number of citations was in 2019 (471 citations). When we compare the citation analysis of the nursing journals in the bibliometric analysis study conducted by Kantek and Yeşilbaş (2020) with the Journal of Human Lactation, it was seen that the citations of JHL journal were high even in only 10-year citation analysis. This finding shows that the Journal of Human Lactation magazine accepts up-to-date and high-quality academic studies, and that the published articles attract the attention of researchers.

When we examined the articles with 50 or more citations in the Journal of Human Lactation, it was determined that the most cited article was the research article "Sharing of bacterial strains between breast milk and infant feces" by Martin et al. (2012) and received 168 citations in eight years. It shows that among the published articles, research articles are cited the most and that this finding is used by researchers who use research articles that explain new information and evidence. However, in the bibliometric analysis of the Journal of Advance Nursing, conducted by Železnik et al. (2017), it was determined that the review articles received more citations. The reason for obtaining a different finding

in our study may be that the Journal of Human Lactation has published more research articles and its researchers have benefited more from the results of current research articles.

The H-index was created in 2005 by Jorge E. Hirsch to measure the productivity, quality, or citation impact of a researcher, an article or journal (Jones et al., 2011). Although originally designed for scientists, the H-index is also used for citation analysis of any country, institution or journal.. According to Hirsch (2005), “If each of the N articles of a scientist has at least h citations, the other articles (N-h) each have h citations, the h index of the scientist is h.” (Hirsch, 2005). For instance, the h-index of a researcher with 10 published articles each with at least 10 citations, is calculated as 10. According to the WoS database of the Journal of Human Lactation, the h-index of all articles was calculated as 35. It is thought that the high h index of the journal has a positive contribution to the impact factor. The H-index is dynamic and the articles published by years change as they are cited.

Multi-authorship affects the quality of a scientific article. The large number of authors, collaboration with other authors, allows authors to benefit from each other's talents by combining their talents (Tucker et al., 2016). 752 articles published in the Journal of Human Lactation were elaborated by 2604 authors. It was determined that 134 articles included in the study had three authors and the number of articles decreased as the number of authors increased. Multiple authorship of an article increases the productivity of scientists and occurs in a shorter time compared to the article produced by a single author (Al et al, 2006). The reason why the Journal of Human Lactation journal has multiple authors is thought to be due to the fact that the journal includes more research articles.

According to the bibliometric examination, when we examine the most prolific authors and countries of the magazine, it was determined that Anne Merewood ranks first with 14 publications, and the most productive country is the United States of America. More than half of all published articles were sent from the United States. The most productive countries after the United States are Australia (second) and Canada (third). Due to the fact that that the number of institutions for education and research in the United States of America and the budget they allocate for these institutions is high, and the journal is published in this country, making it the country that sends most articles. Anne Merewood, who has the most publications, is the former editor-in-chief of the Journal of Human Lactation and is therefore thought to have more publications than any other author.

In bibliometric research, keywords are accepted as basic elements representing knowledge concepts and are widely used to reveal the knowledge structure of

research areas (Su & Lee, 2010). The frequency of keywords indicates which subjects tend to be more (Kantek & Yesilbas, 2020). In the keyword analysis of the Journal of Human Lactation, it was determined that the most used keyword was “breastfeeding”. The reason why “breastfeeding” is the most used keyword in the ten-year history of the journal is due to the name of the journal and it is thought that the use of the keyword “breastfeeding” will increase as the number of articles published in the journal increases.

LIMITATIONS

Research data is limited to only articles browsed in the Web of Science database. Study results may differ if another database is used. In addition, the citation numbers specified in this study indicate the numbers on the date of the scanning. The number and order may differ in the survey to be made at a different time.

CONCLUSION

According to the bibliometric analysis results from 2010 to 2020, it was determined that 752 articles written by 2604 authors were published in the Journal of Human Lactation. It has been observed that the most productive country is the United States of America, and the number of articles published in the journal has increased in recent years. This study provides in-depth information about the history and current status of the journal between 2010 and 2020 and provides more information for readers / authors.

There is no conflict of interest between the authors.

Author Contribution:

Research design: Meltem Özkaya, Öznur Körükcü; **Data collection:** Meltem Özkaya; **Data analysis:** Meltem Özkaya, Öznur Körükcü; **Supervision/consulting:** Öznur Körükcü; **Writing of the article:** Meltem Özkaya; **Critical review:** Öznur Körükcü, Meltem Özkaya

No Conflict of interest.

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