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Research Topics on Malpractis and Medical Error in Nurses and Midwives from 1999 to 2023: A Bibliometric Analysis Using VOSViewer

1999'dan 2023 Yılına Kadar Hemşire ve Ebelerde Malpraktis ve Tıbbi Hatalarla İlgili Araştırma Konuları: VOSViewer Kullanılarak Bibliometrik Analiz

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ABSTRACT

It was carried out to identify and visualize the studies conducted in the field of medical error and malpractice in nurses and midwives between 1999 and 2023 and to reveal the trends in this regard. The data was obtained from the "Web of Science Core Collection" database on July 24,2023. Performance analysis, scientific mapping and bibliometric analysis were performed using the VOSviewer (1.6.15)software program. In the WoS database, the research universe was found to be 6,105 articles in the search conducted with the keywords "Medical Errors" OR "Medical Error"AND "Nursing"AND"Midwifery" OR "Midwife" AND "Malpractice" and the analysis was made on 1,878 publications. As a result of the analysis, it was found that the most used keywords in the WoS category were "medical error" and "adverse event", the author with the most publications was "Gallagher TH" (n=21), the country was USA (n=830), the institution was "Harvard University" (n=155) and among the funding institutions, the "United States Department of Health Human Services" (n=223) supported the most publications. The results of the bibliometric analysis showed that the studies conducted in the field of medical error and malpractice in nurses and midwives between 1999 and 2023 have increased gradually since 2015, and reached the highest number in 2021. It is thought that the results obtained in the study will evaluate the current situation in the field of medical error and malpractice in nurses and midwives, provide a general perspective on the field, and guide the research planned to be conducted in this field.

Keywords: Bibliyometri, Malpractice, Medical Error, Midwifery, Nursing, Vosviewer.

ÖZ

Hemşire ve ebelerde tıbbi hata, malpraktis alanında 1999-2023 yılları arasında yapılan çalışmaların tespit edilmesi ve görselleştirilmesi ve bu konudaki eğilimleri ortaya koymak amacıyla gerçekleştirildi. Veriler, 24 Temmuz 2023 tarihinde "Web of Science Core Collection" veri tabanından elde edildi. VOSviewer (1.6.15) yazılım programı aracılığı ile performans analizi, bilimsel haritalama ile bibliyometrik analizler yapıldı. WoS veri tabanında "Medical Errors" OR "Medical Error" AND "Nursing" AND "Midwifery" OR "Midwife" AND "Malpractice" anahtar kelimeleri ile yapılan taramada araştırma evreni 6.105 makale olarak bulundu ve analizi 1.878 yayın üzerinden yapıldı.Analiz sonucunda WoS kategorisinde en çok kullanılan anahtar kelimelerin"medical error","adverse event" olduğu, en fazla yayın yapan yazar "Gallagher TH" (n=21), ülke USA'nin (n=830), kurum olarak ise "Harvard Unıversıty"nin (n=155) olduğu ve fon kurumları arasında ise "United States Department of Health Human Services" in (n=223) en fazla yayını desteklediği bulundu. Bibliyometrik analizin sonuçları, 1999-2023 yılları arasında hemşire ve ebelerde tıbbi hata, malpraktis alanında yapılan çalışmaların son yıllarda 2015 yılından itibaren giderek arttığı, en yüksek sayıya ise 2021 yılında ulaştığını gösterdi. Çalışmada elde edilen sonuçların Hemşire ve ebelerde tıbbi hata, malpraktis alanında mevcut durumunun değerlendirilmesi, alanla ilgili genel bir bakış açısı sunması ve bu alanda yapılması planlanan araştırmalara rehberlik edebileceği düşünülmektir.

Anahtar Kelimeler: Vosviewer, Bibliyometri, Tıbbi Hata, Hemşirelik, Ebelik, Malpraktis.

Ethics committee approval was not required because the study was a retrospective review of previously published research

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INTRODUCTION

Error and medical responsibility in medicine have a long history dating back to Antiquity. Medical error, defined as failure in a pre-planned action or using an incorrect model to achieve the desired goal, is one of the most worrisome issues in the medical field because, as statistics show even in the most advanced medical facilities, many patients suffer great losses every year due to medical malpractice.[1,2] The subject of complaints arising from medical malpractice is one of the most important occupational tensions for every medical professional in the profession. Unfortunately, most of the personnel working in the field of treatment believe that it is impossible to have malpractice, since they have taken all the necessary precautions and care in the course of their professional activities, and they do not feel any discomfort associated with such an event.[3,4]

All members of the healthcare team, and especially midwives, no matter how skilled and dedicated they are, can make mistakes during patient care[1,5,6]. The most important mistakes that will lead patients or their families to complain about the medical team include death or complications for expectant mothers or children, which are unacceptable errors in the opinion of health system administrators, and therefore error reduction strategies should always be one of the priorities of their work.[7,8]

The importance of preventing medical malpractice is so great today that the quality of health care refers to the delivery of health services at the appropriate time, by a qualified person and without malpractice using the least resources.[1,9] Medical malpractice refers to an unlawful act, some non-routine procedure, an act below professional value, a treatment, or omission, and is classified as imprudence, negligence, lack of relevant skills, and disobedience to government regulations (in medicine and midwifery). However, research has shown that the majority of medical malpractice goes unreported, making it one of the most worrisome issues in the healthcare system.[10]

In recent years, it has been seen that the number of people covered by medical care companies has increased. Increased awareness of the legal rights of individuals and inadequate efforts of physicians and midwives to communicate correctly with patients are among the main reasons for the increase and upward trend of legal complaints.[11,12] International reports of a large number of complaints against doctors in different countries reveal that despite significant scientific advances in the field of diagnostic and treatment services and the use of new technology, complaints sent to medical councils tend to increase.[2,13] About one-fourth to one-fifth of malpractice cases are actually some kind of medical malpractice. Johnson's research in Australia showed that midwives and gynaecologists pay high amounts of malpractice insurance (around 18%), while midwives and gynaecologists make up only 2% of doctors and paramedics.[14] However, medical malpractice and related complaints, as well as patients' appeals to court and requests for redemption, have plunged the medical community and medical staff into a growing crisis.[13]

As a result, while contingency plans are revealed when a clinician is often confronted with thoughts of shame or embarrassment following an accusation by patients or family of doing something wrong, medical errors, and other deficiencies in judgment; It is also a condition in which there may be a tendency to over-diagnose and react with unnecessary surgeries that can harm patients. This over-care approach is psychologically soothing. But it can also be for profit. The increase in cases of medical error and the question marks of health personnel on this issue are increasing. As for the contribution of bibliometric analysis to clinician midwifery and nurses working in malpractis, in addition to allowing evaluation of the literature in general, it is extremely important in terms of providing data on the most important researchers, most cited publications, institutions, and journals to contribute to evidence-based nursing and midwife practice.

Following the profile of the literature revealed in the bibliometric analysis is very important for malpractis midwife and nurses who want to contribute to the literature and who are new to the profession and whose development process is underway, to provide evidence-based care and to become professionals. For this reason, this analysis method, which reveals the development of a scientific field by using mathematical and statistical methods, offers a functional unique method for researchers and clinicians to evaluate the increasing body of research.

MATERIAL AND METHOD

The following questions were answered for research on malpractice and medical errors in the field of midwifery and nursing:

•What is the distribution of publications by year?

•What is the distribution of the authors, countries, institutions, funding institutions and journals that contribute the most to the field?

•What is the distribution of the most cited publications?

•What is the distribution of publications according to the language of publication?

•What is the network map of co-author-authors, institutions, and country connections?

•What is the common keyword analysis map?

•According to citation analysis, what is the appearance of the network map of articles, journals, institutions, and countries?

Study Desing

In this descriptive study, the Web of Science (WoS) database, which processes the title, keywords, and abstract sections of articles in journals it scans as a data set, was used. WoS is a bibliographic database that shows the impact of scientific journals in various disciplines, the number of citations received by published articles, and lists the authors' articles and references of the articles. In this database, studies published in the field of malpractis and medical erros were examined using bibliometric analysis and the current situation at the global level was revealed.

Bibliometric analysis is a scientific method that provides quantitative and qualitative analysis of large bibliometric data to provide information on key research components, including authors, countries, journals and emerging trends.[14] Unlike other commonly used review methods, such as systematic reviews, which are limited to specific and restricted aspects of a research question, bibliometric analysis provides an objective and comprehensive overview of the literature in a specific research field to show general research trends and reveal future directions. Bibliometric analysis can accommodate large datasets and is better suited for large scopes of work.[14,15] The important point in bibliometric analysis is the databases from which the data set will be obtained. There are now multiple databases available for bibliometric analysis. The most frequently used databases include PubMed, Embase, Scopus, SpringerLink, Google Scholar, and ScienceDirect. These databases have different features.[16] Among these, WoS, the most preferred by researchers, was the database used to obtain the data set in the research.[17]

Setting

For bibliometric data, 6,105 publications were reached as a result of searching the keywords “malpractis,” “medical error,” “midwifery,” “midwife” and "nurse“ in the WoS database. The indexes indexed in the database were limited to the Science Citation Index Expanded, the Social Sciences Citation Index, and the Emerging Sources Citation Index. The criteria for inclusion in the database were limited to WoS category, publication type as articles and systematic reviews, publication language (all languages published in this field were included),

publishing institutions, countries (institutions and countries publishing in this field were included), funding institutions, citation topics, journals, authors, and publications between 1999 and 2023. As a result of the limitations, a total of 1878 articles obtained from the WoS database constituted the data set of the study (Figure 1).

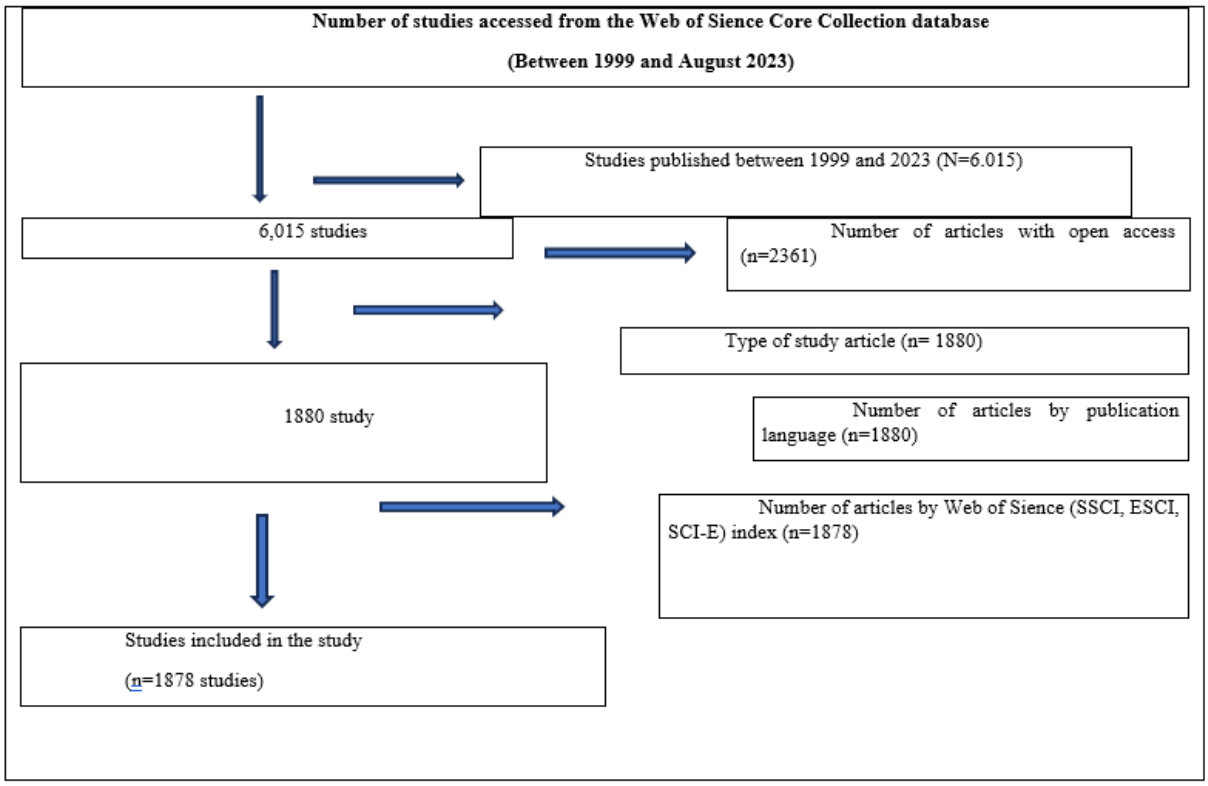


Figure 1. Publication Selection Flow Diagram

Ethical Approval

Ethics committee approval was not required because the study was a retrospective review of previously published research.

Data Collection

The data of the study were obtained from publications in the WoS database between 1999 and 2023 on July 24th, 2023.

Data Analysis

In the bibliometric analysis, the numerical distribution of publications and citations by years, prominent countries, the language with the most publications, journals, active institutions, active publications, co-authors, partner institutions, partner country collaborations, prominent researchers, and the most used keywords were analyzed. In this study, the VOSviewer (1.6.15) package program was used to visualize the bibliometric analysis method. To better understand the results, the data were represented graphically using VOSviewer software (Van Eck and Waltman, 2010). Analysis and graphical interpretation are invaluable because they can help researchers better understand the issues related to research funding and the main trends in this field. VOSviewer is a software that analyzes bibliographic data from different databases such as WoS, Scopus, and PubMed.[16] VOSviewer offers clear graphical maps that display and visualize results according to different techniques, including co-citation analysis, bibliographic matching, co-authorship, and co-occurrence of keywords.[17]

Network analysis is a visualization method that is frequently used in many fields to formally examine the relationships of individuals, institutions or objects in the social system and the changes in these relationships in the social structure in space and time.[18,19] It consists of the relationships of clusters, which constitute the total sample

for network analysis and are also the unit of analysis, and the edges connecting the clusters. In this way, implicit relationships are visualized and modeled.[18,20] The reason for choosing network analysis as a method in the research is that it effectively presents the holistic and temporal dimension, which is difficult to grasp due to the continuous and cumulative nature of the literature.

For this reason, bibliometric analysis has been preferred in many studies investigating new trends in terms of identifying scientific publications by visualizing the relationships between certain topics, terms, concepts, journals, authors, institutions or countries.[19,21,22] The first stage of the analysis involves determining how often concepts are used. This principle is simply the number of times a unit is used in the data set. The findings obtained as a result of frequency analysis are transferred to network maps as a result of assumptions and constitute the first basic data. These data are expressed as clusters in network analysis and represented as circles on the maps. The lines between the circles represent the connections, and the thickness and sum of these lines represent the connection strength.

The presence of each concept, person, or object in the literature is expressed by the number of clusters, the number of relations, and the total strength of the concept it represents. In this study, the concepts that were repeated at least twice for the unit of analysis and had terminologic value were accepted as assumptions. The threshold value is determined by researchers through the trial and error method to increase the readability of the created maps in line with the research purpose.[22,23] When determining the threshold value for the research, if concepts used at least once were included in the network analysis, independent concepts consisting of a single cluster without establishing a relationship with other concepts would be seen more on the map. In this case, the threshold value was limited to two because the study tried to determine the direction in which the discipline was heading through common concepts that were used very frequently, rather than concepts used in individual studies.

RESULTS AND DISCUSSION

Trends İn Publications

The most publications were first published in 2021 (n = 206 articles), second in 2020 (n = 198 articles), and third in 2022 (n = 178 articles). It was found that the first publications were made in 1999 (n =19 articles) (Table 1).

Table 1. Distribution of Publications by Year (1999- August2023)

Publication Years	Record Count	% of 1.878
2023	66	3.514
2022	178	9.478
2021	206	10.969
2020	198	10.543
2019	142	7.561
2018	111	5.911
2017	112	5.964
2016	119	6.337
2015	111	5.911
2014	77	4.100
2013	76	4.047
2012	89	4.739
2011	49	2.609

Table 1. (Continued)

2009	50	2.662
2008	54	2.875
2007	32	1.704
2006	48	2.556
2005	31	1.651
2004	24	1.278
2003	16	0.852
2002	16	0.852
2001	8	0.426
2000	6	0.319
1999	1	0.053

The top 10 authors countries, institutions, and journals that contributed the most to the field

According to the analysis of the top 10 authors , countries , institutions , funding agencies, and journals that contributed the most to the field , the author who contributed the most was Gallagher TH (n = 21), the country that published the most was the United States of Americ a (USA)(n = 180), the institution that contributed the most was Harvard Unıversıty (n = 155), the institution that provided the most funding was United States Department of Health Human Services (n = 223), and the journal that published the most was Journal of General Internal Medıcıne (n = 64) (Table 2).

Table 2. Top 10 authors, countries, institutions, funding institutions, and journals (1999 -August 2023).

Author	Article count	Country	Article count	Institution	Article count	Funding organization	Article count	Journal	Article count
Gallagher TH	21	USA	30	Harvard Unıversıty	155	United States Department of Health Human Services	223	Journal of General Internal Medıcıne	64
Landrigan CP	21	England	131	Harvard Medıcal School	98	National Institutes of Health Nih Usa	153	BMC Health Servıces Research	52
Shanafelt TD	19	Canada	101	Brıgham Women S Hospıtal	85	Agency For Healthcare Research Quality	89	Internatıonal Journal For Qualıty In Health Care	52
Czeisler CA	13	Australıa	79	Unıversıty of Calıfornıa System	67	National Institutes of Health Research Nihr	20	Academıc Medıcıne	47
Bates DW	12	Germany	69	Stanford Unıversıty	49	Nih National Center For Advancing Translational Sciences Ncats	18	Plos One	38

Table 2. (Continued)

Schwappach DLB	11	Netherlands	67	Unıversıty of Washıngton	47	Nih National Heart Lung Blood Institute Nhlbi	18	Bmj Open	33
Barger LK	9	Iran	61	Unıversıty of Washıngton Seattle	47	Nih National Center For Research Resources Ncrr	15	Internatıonal Journal of Envıronmental Research And Publıc Health	30
Mazor KM	9	Swıtzerland	56	Unıversıty of Mıchıgan	45	Nih National Library of Medicine Nlm	15	Qualıty Safety in Health Care	25
Thomas EJ	9	Saudı Arabıa	51	Unıversıty of Mıchıgan System	45	Canadian Institutes of Health Research Cihr	14	Journal of Patıent Safety	24
Weingart SN	9	Peoples R Chına	50	US Department of Veterans Affaırs	44	Nih National Cancer Institute Nci	14	BMC Medıcal Educatıon	23

Analysis of coauthor-author, institution, country and network map

When the co-author analysis was limited to a minimum of 2 publications and 2 citations per author, the total number of authors was found to be 8662. Based on the minimum number of publications and minimum citations per author, the number of authors meeting the threshold values was found to be 719. When the co-authorship, citation and total link power of the authors were examined, "gallagher, thomas h." was found to be the number of co-authorships (n=20), the number of citations (n=806), the total link strength was 81, "shanafelt, tait d."the number of co-authorships (n=19), the number of citations (n=4732), the total link strength was 60, the number of "landrigan, christopher p." co-authorships (n=15), the number of citations (n=1090), and the total link strength were 67 (Figure 2A). In the analysis of the co-author institution, when the threshold value per institution was limited to a minimum of 2 publications and 2 citations and analyzed, the number of institutions doing joint work was found to be 2759. The number of collaborators meeting the threshold values was found to be 653. "brigham & womens hosp" publication count (n=69), number of citations (n=5310), total link power 261, "harvard univ" publication count (n=67), number of citations (n=6821), total link power 181, "univ Michigan" publication count (n=44), citation count (n=1417), total link power 75, "univ calif san Francisco" publication count (n=34), citation count (n=1595), the total connection strength was found to be 123 (Figure 2B). In the co-author country collaboration analysis, when the threshold per country was limited to a minimum of 2 publications and 2 citations per country and analyzed, the number of countries doing joint work was found to be 97. The number of collaborating countries that met the threshold values was found to be 68. The number of articles in the United States (n=823), the number of citations (n=34897), the total link strength was 166, the number of England articles (n=131), the number of citations (n=3799), the total link strength was 101, the number of German articles (n=69), the number of citations (n=883), the total link strength was 56, the number of Netherlands articles (n=67), the number of citations (n=1039), and the total link strength was 49 (Figure 2C).

The cluster analysis of keywords shows the basis of the literature and research themes.[28] A link depicts a connection or a relation between two items. In this context, links indicate the number of links of an item with other items, and the total link strength indicates the total strength of the links of an item with other items.[29] When the common word analysis was done, it was seen that the network consisted of 193 keywords, 12 clusters, 1669 links that passed the threshold value, and the total connection strength was

3531. Medical error in nurses and midwives, common keyword in the field of malpractice in the field of network map analysis of the keyword "medical error", 9 clusters, 89 links, 219 total connection strength, "adverse event" keyword 7 clusters, 64 links, total link strength 203 "patient safety" keyword 11 clusters, 152 links, 842 aggregate link strength, "risk management" keyword 7 clusters, 43 links, total link strength of 93," keyword "medical error", 2 clusters, 163 connections of 949 total link strength, "burnout" keyword, 1 cluster, 70 links, total link strength of 186, were found as a result of the analysis (Figure 2D).

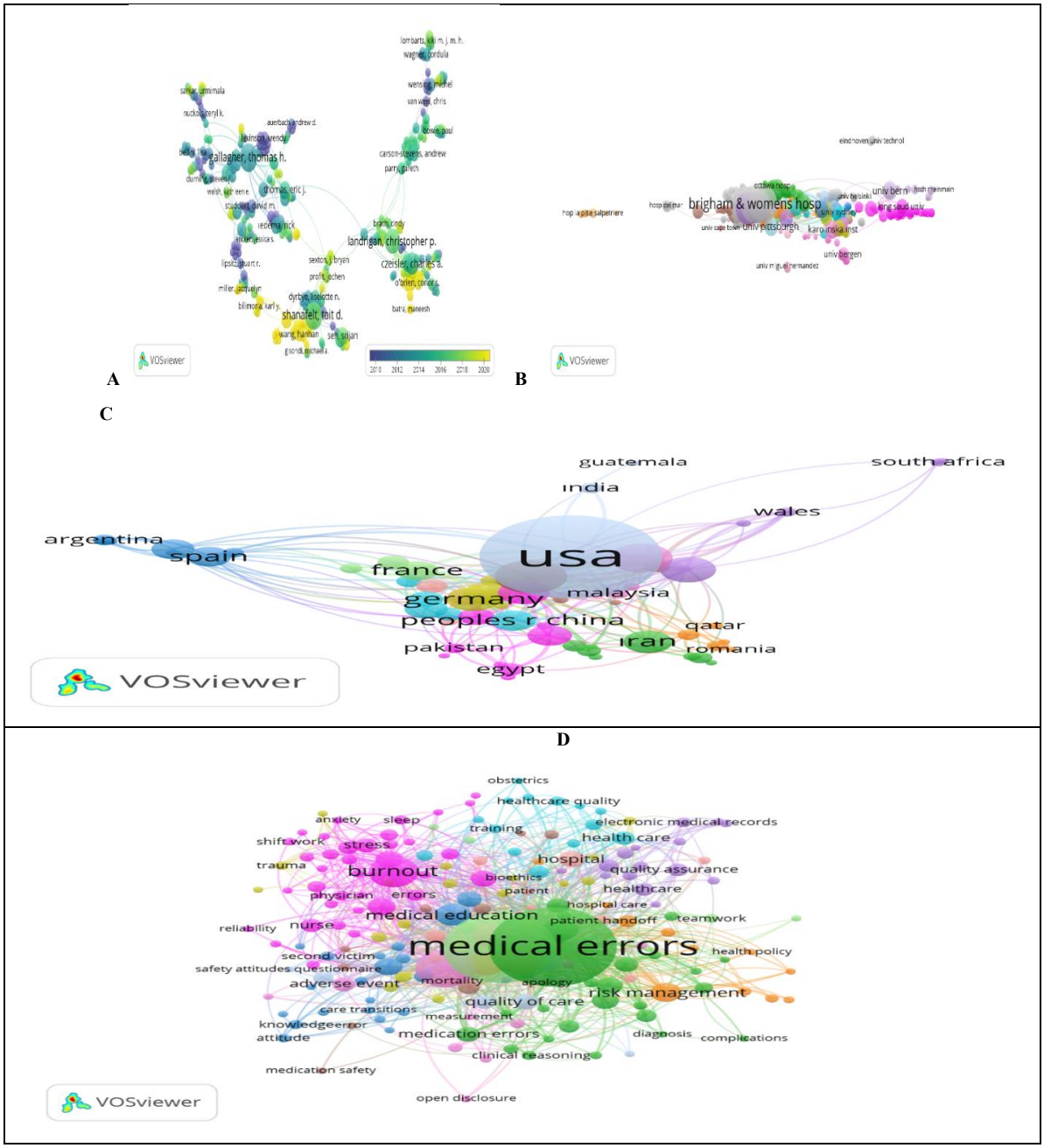


Figure 2. Co-Author- Author, Institution, Country Analysis and Keywords Network Map

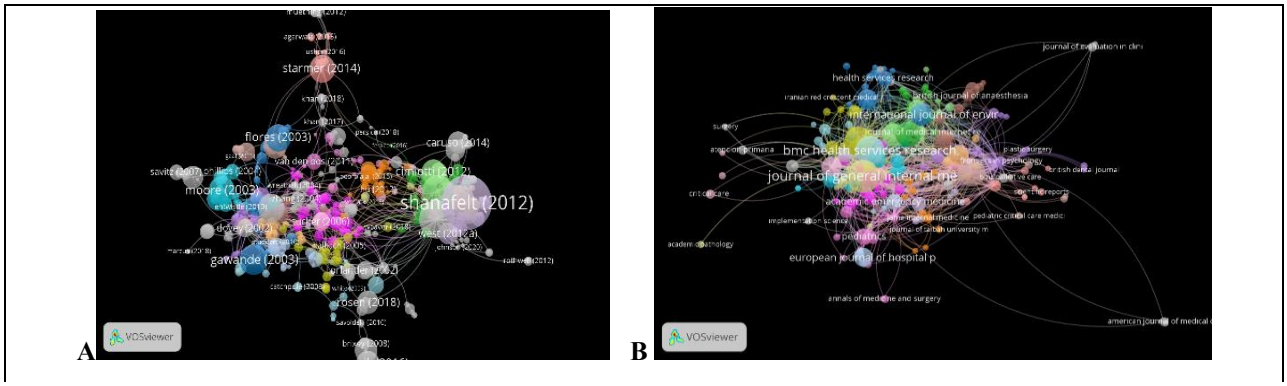
The Network Map According to Citations

When the threshold value per article for citation analysis of articles was limited to a minimum of 10 citations and analyzed, the total number of publications was found to be 1878. Based on the minimum number of citations, the number of publications that met the threshold values was found to be 855. According to the number of citations, the

article published in Shanafelt (2012) had 14 clusters, 35 links and citations were 1911, the article published in Blendon (2002) had 31 clusters, 55 links and citations were 507, and the article published in West (2006) had 27 clusters, 89 links and citations were 916 (Figure 3A). For the citation analysis of journals, when the article citation threshold value per journal is limited to 2, it is seen that the total number of journals is 696 and the number of journals that meet the threshold value is 245. The most cited journal received 2343 citations for "archives of internal medicine", 1175 citations, "health services" 1071 and "bmc health services research" 954 citations, respectively (Figure 3B). When the number of articles related to the number of citations received by the institutions was limited to 2 and the citation threshold value was limited to 2, it was seen that the total number of institutions was 2759 and the number of institutions meeting the threshold value was 653. "Harvard Univ" received 6821 citations, "Brigham & Womens Hosp" had 5310 citations, "Stanford Univ" had 3569 citations (Figure 3C). When the number of citations received by the countries was limited to the minimum number of articles 2 and the minimum citation threshold value was 2, it was seen that the total number of countries was 97 and the number of countries meeting the threshold value was 68. According to the country citation analysis, the United States received 34897 citations, England received 3799 citations, and Canada received 3447 citations (Figure 3D).

In this bibliometric analysis, 1878 WoS-indexed articles published from 1999 to the present on the malpractis and medical error were identified. According to the results of our analysis, the number of global publications on the malpractis and medical error about midwifery and nursing increased during this period, reaching a peak in 2021. A downward trend in global publication output was observed in 2023. In another study on bibliometric-based overview methods of malpractis studies, it was found that the first article was published in 1999, but the number of publications increased after the 2006 s, and contrary to our analysis result, 53.94 % of the articles were published after 2017.

Medical error, defined as failure in a pre-planned action or using a false model to achieve the desired goal, is one of the most worrisome issues in the medical field.[25] When the researches are examined, it is seen that the number of medical people covered by medical care companies has increased in recent years. The results of this bibliometric analysis show that between 2003 and 2023, studies on medical error have been steadily increasing in recent years.[13,17] It was seen that the interest of researchers in the subject increased significantly from 2020 onwards. The results of the analysis also show that the increase in awareness of the legal rights of individuals and the inadequate efforts of physicians and midwives to communicate correctly with patients are among the main reasons for the increase and upward trend of legal complaints.[26,27]



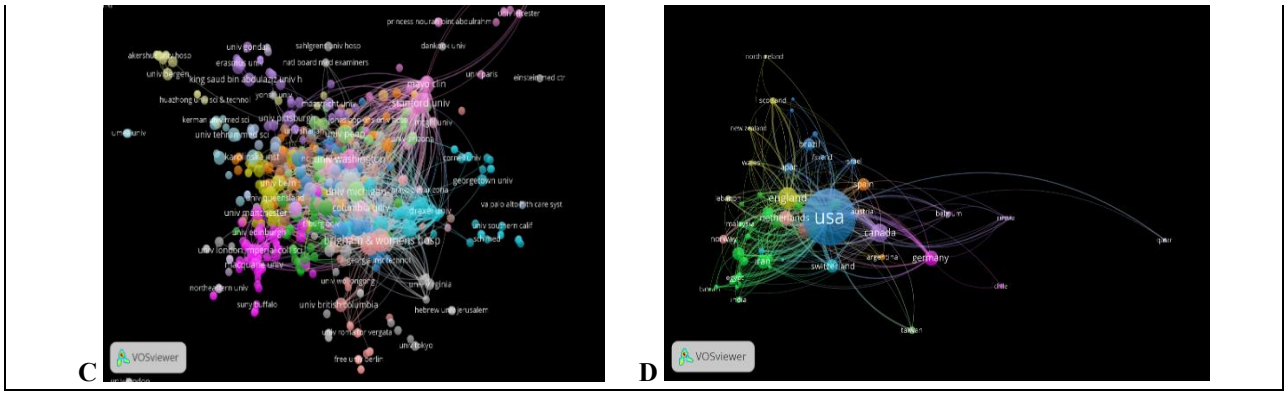


Fıgure 3.Article, Journal, Institution, Country Network Map According to Citation Analysis

In recent years, it has been seen that the number of people covered by medical care companies has increased.[28,29] International reports of a large number of complaints against doctors in different countries reveal that despite significant scientific advances in the field of diagnostic and treatment services and the use of new technology, complaints sent to medical councils tend to increase. About one-fourth to one-fifth of malpractice cases are actually some kind of medical malpractice. Johnson's research in Australia showed that midwives and gynaecologists pay high amounts of malpractice insurance (around 18%), while midwives and gynaecologists make up only 2% of doctors and paramedics.[30,31] In this bibliometric analysis, when the studies conducted by country in the field of medical error and malpractice in nurses and midwives are examined, it is stated that the USA is the country that contributes the most. In addition, it was found that the institution that published the most in this field was "Harvard University", the "United States Department of Health Human Services" supported the publication and the "Journal of General Internal Medicine" supported the publication.

For the first 180 years following the founding of the United States, doctors were occasionally sued for medical malpractice.[32,33] Since the 1960s, the number of malpractice cases has increased at a geometric rate, and in the 1970s, physicians began to practice defensive medicine. This has continued with lawsuits of medical personnel in other countries and outside the United States. Depending on the cases in the countries, the interest of researchers in these regions is increasing. This situation is also related to the countries that are interested in malpractice and where there are the most cases and trying to bring solutions.[34,35] As a result of the study, differences are observed between published articles on the subject and authors with high citation rates. Depending on the originality and content of the subject between publications and citations, there may be an increase or decrease in the right proportion or inverse proportion, and the number of citations may decrease as the publication becomes old or not visible. According to the study, although Gallagher TH from USA is the author with the most publications, the highest number of citations belongs to Shanafelt, Tait D.[36]

Strengths And Limitations

Our data analysis is objective and clearly shows general global trends in research on malpractice and medical error, as well as research frontiers that can serve as a reference for researchers wishing to conduct more indepth studies in this area. However, there are some limitations to the study. We may have missed other relevant articles in the literature because our study only collected articles from a single database (i. e. the WoS database). In addition, because the study included publications published in the Science Citation Index Expanded, the Social Sciences Citation Index, and the Emerging Sources Citation Index, not examining publications in other databases may have hidden some important points in this research field. Another limitation is that the analysis was conducted with a single keyword.

Therefore, the results of the study may not cover all the studies conducted in this field. Finally, the quality of publications cannot be diffeentiated according to the number of citations in the VOSwiever program.

CONCLUSION AND RECOMMENDATIONS

The results of the bibliometric analysis showed that between 1999 and 2023, studies in the field of medical error and malpractice in nurses and midwives have been increasing in recent years since 2015, reaching the highest number in 2021. When the literature in the field of medical error and malpractice in nurses and midwives was examined, it was seen that more studies were needed in this area. It is thought that the results obtained in the study may guide the medical error in nurses and midwives, the evaluation of the current situation in the field of malpractice, providing a general perspective about the field and the planned research in this field. At the same time, midwife leaders and policymakers, by understanding the experiences of midwives and the problems they face during the investigation of midwifery practice, can plan future strategies to support, equip and prepare midwives for the risks and reality of scrutiny in a legal forum.

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