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ORIGINAL RESEARCH

A Bibliometric Analysis of Research Articles on Midwifery Based on the Web of Science

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Objective: This study aimed to bibliometrically analyse the main features of the 100 top-cited articles on the midwifery index on the Web of Science.

Methods: Academic articles on midwifery' research published from 1985 to 2020 were included. VOSviewer 1.6.15, SPSS 22.0 software and a homemade applet were used to identify, analyse and visualise the citation ranking, publication year, journal, country and organisation of origin, authorship, journal impact factor and keywords along with the total link strength of countries, organisations and keywords.

Results: Among the 100 top-cited articles, the highest number of citations of the retrieved articles was 484. The median number of citations per year was 5.16 (interquartile range: 3.74–8.38). Almost two-thirds of the included articles (n = 61) centred on nursing and obstetrics/gynaecology. The top-cited articles were published in 38 different journals, the highest number of which was published by *Midwifery* (15%). Australia was the most productive country (24%). According to the total link strength, the sequence ran from the United States (28) to England (28) to Australia (19). The University of Technology Sydney and La Trobe University in Australia topped the list with four papers each. Hunter B was the most productive author (n = 4), and the average citations were positively related to the number of authors ($r = 0.336$, $p < 0.05$).

Conclusion: This study identified the most influential articles on midwifery and documented the core journals and the most productive countries, organisations and authors along with future research hotspots for this field; the findings may be beneficial to researchers in their publication and scientific cooperation endeavours.

Keywords: bibliometric analysis, citation, midwifery, total link strength

Introduction

The health status of women and children is an important indicator commonly used worldwide to measure the level of social development and the comprehensive national strength of the country, and midwives play a pivotal role in ensuring the health and safety of pregnant women and newborns.[1] According to the International Confederation of midwifery, the World Health Organization and the International Federation of Gynaecology and Obstetrics, the midwife is recognized as a responsible and accountable professional who works in partnership with women to give the necessary support, care, and advice during pregnancy, labor and the postpartum period, to conduct births on the midwife's own responsibility and to provide care for the newborn and the infants.[2]

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Midwifery play a crucial role in reducing maternal and neonatal mortality.[3] However, there is a dearth of midwifery both globally and within China. With the implementation of China's comprehensive two-child policy in 2016 and three-child policy in 2021, a new round of fertility peaks has emerged in recent years, and the proportion of older pregnant women has increased significantly; maternal and child health are thus facing severe challenges.[4] According to the *National Bureau of Statistics 2020 China Statistical Yearbook*[5] between 2016 and 2019, 17.34 million babies were born, suggesting that a large number of midwifery are urgently needed in the workforce.

Addressing this concern, the National Health Commission of China issued its "Notice on Issuance of Guidance for the Reform and Development of Nursing Services (National Health and Medical Development [2018] No. 20)", identifying midwifery as 'scarce talents'. The notice further expanded the scale of professional recruitment for nursing and called for improving the proportion of midwife recruitment and vigorously developing the institutional training of midwifery.[6] In 2015, the China Maternal and Child Health Association completed the evaluation and licensing of the first nine standardised midwifery training bases. Furthermore, it organised standardised midwifery training courses in August 2016, September 2017, September 2018, September 2019 and March 2020 to train nearly 2000 midwife professionals, promoting on-The-job training. Similarly, many counties started graduate and specialised nursing–midwifery education programmes (Toosi, Judith, Hammond, Cummins, Lakhani). However, research output remains an important indicator of both the progress in the midwifery profession and the quality of healthcare services in any country.[7–13] Although midwifery research in China is continuously developing, most of the research is still limited to the stage of localization and exploration of related influencing factors, and it is necessary to further expand and deepen the focus of research, and there is still a certain gap between our research and some developed countries, and it is necessary to continue to strive to increase the pace of midwifery research in our country.[14] At present, most scholars' studies have evaluated the influencing factors of waiting quality, treatment options for different stages of labor, and the effects of interventions through experimental studies or investigative studies.[14]

Bibliometric analysis was first published in the Journal of the American Medical Association in 1987. It has been widely used in macroscopic evaluation of domestic and foreign research trends in medical treatment, science and technology, but the application of midwifery related research is still relatively small. This method is a unique tool to analyze the characteristics and importance of published articles. It is based on the number of citations of an article, and usually, it is used to evaluate an article's academic impact.[15–17] In 2006, Seaton HJ mapped the literature on the nursing–midwifery profession using research objects including journal papers, monographs, government documents and miscellaneous papers. In recent years, researchers have attempted to undertake bibliometric studies on nursing and midwifery in Latin America, France, the Caribbean and Arab countries.[18–21] However, a bibliometric analysis of the seminal scientific output of midwifery worldwide has not been conducted. Thus, we conducted a bibliometric study to evaluate the 100 top-cited articles on midwifery using a visualised analysis of the selected articles, including the citation ranking, publication year, journal, country and organisation of origin, authorship, journal impact factor (IF) and keywords as well as the total link strength of countries, organisations and keywords, and the final purpose was to explore the research trends of midwifery worldwide, and to explore the research status, research hotspots, and research frontiers of midwifery by analyzing the relevant domestic and foreign literatures through bibliometric methods, guiding research methods for midwifery scholars at home and abroad.

Methods

Basic Information of the Top-Cited Articles

Articles from the Science Citation Index Expanded™ database of the Web of Science (WOS) were searched on 31 December 2020 using the following retrieval strategy (Appendix A): Mesh = "nurse midwifery" OR TS = "midwifery" OR TS = "midwife" AND Language = English. The publishing year was set from 1985 to 2020. We included journal articles, original articles and synonymous publications with the main subject of midwifery. The

exclusion criteria included a review, systematic review, meta-analysis, editorial, meeting abstract or letter or an article unrelated to midwifery. The selected articles were assessed and screened by two independent reviewers (T. Li and X. Fan). A third researcher (X. Song) was consulted to address any discrepancies. For articles with incomplete information, the required material was obtained through other retrieval platforms, such as PubMed and Google Scholar.

Citation Analysis Indices

The citation analysis indices of each eligible article included the article title, publication year, journal, journal's IF, author, authors' organisation and country, keywords, total citations, average citations per year, total link strength, cooperative countries and organisations. The confirmed keywords were combined before an analysis by a homemade applet (eg "nurse midwife", "nurse–midwifery" and "midwifery" were combined as "midwifery"). The main design of this study referred to previous published bibliometric studies.[22–26]

Statistical Analyses

The statistical analyses were performed using SPSS 22.0 and Microsoft Excel 2019 software, which were used for data analysis and collation, respectively. Means with standard deviations were used to express continuous variables, while medians and interquartile ranges (IQRs) were used to express discrete variables. A *t*-test (for parametric continuous variables) was used for the comparative analysis. Pearson's product–moment correlation coefficient (for continuous variables) and Spearman's rank correlation coefficient (for categorical variables) were used for the correlation analysis. Two-tailed statistical significance was set at $p < 0.05$. The collaborative networks of the countries and organisations were visualised using VOSviewer 1.6.15. Additionally, we used a homemade applet for synonymous keyword merging.

Results

Basic Characteristics

The included top-cited articles are listed in Table S1 in descending order according to the total citations.[27–125] The most frequently cited article was cited 484 times, and the median number of citations was 75.00 (IQR: 62.00–95.75). Considering the total citations related to the publication year, we added a column of data on the average citations adjusted by the publication year. Based on average citations, 9 of the top 10 articles were published in the last decade. However, the number changed to 5 according to the number of total citations. The maximum average citation per year was 64.71, and the median average citation per year was 5.16 (IQR: 3.74–8.38).

These articles were published between 1988 and 2018, with a mean of 5 articles published per year. The highest number of publications was 9, which occurred in 2004 and 2012, followed by 8 in 2005, 2011 and 2014, respectively, collectively contributing 42 of the 100 top-cited articles. According to the WOS categories, nearly half (45%) of the selected articles focused on nursing, followed by obstetrics and gynaecology (16%), general and internal medicine (16%) and public environmental and occupational health (14%). Four articles, which were published in 1988, 2015, 2016 and 2018, were categorised as multidisciplinary sciences (Figure 1).

Journal Distribution Analysis

The journals with two or more top-cited articles are listed in Table 1 in descending order by the number of total citations. The 100 top-cited articles were published in 38 different journals; *Midwifery* published the greatest number of these articles (15%), followed by the *Journal of Midwifery & Women's Health* (9%) and *Birth: Issues in Perinatal Care* (7%). Thirteen journals had an IF higher than 5, and these journals contributed nearly one-third of the top-cited articles (n = 28). The IF of *The New England Journal of Medicine* was the highest (IF = 74.699), followed by *The Lancet* (IF = 60.392) and *The BMJ* (IF = 30.223), which published 1, 6 and 6 of the included 100 articles, respectively. Half of the journals published only 1 top-cited article. The maximum and median IFs of these journals were 74.699 and 2.906, respectively (IQR: 2.032–5.676). The top-cited articles from journals with

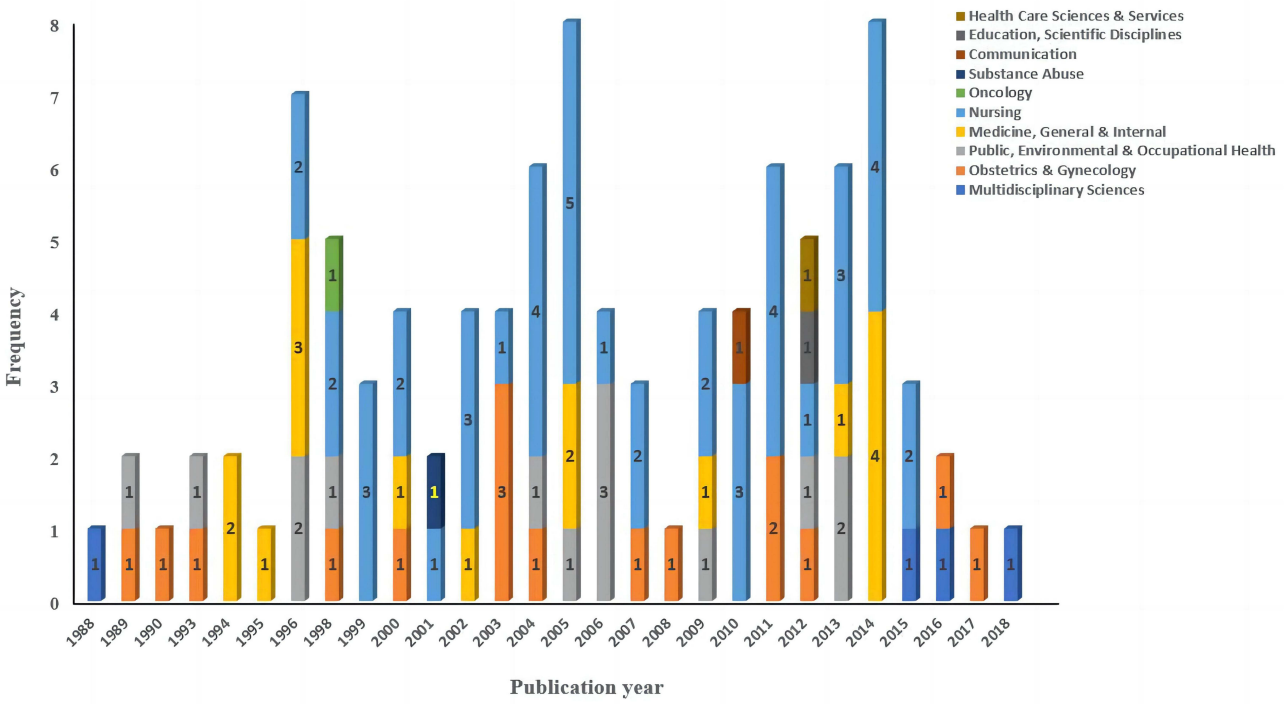

Figure 1 The publication year distribution of the 100 top-cited articles.

an IF higher than 5 were cited more frequently (median [IQR]: 6.464 [5.528–18.984] average citations vs 2.321 [1.760–2.906] average citations; $t = 2.334$, $p<0.05$). However, the journal IFs and average citations per year exhibited no linear correlation ($r = 0.092$, $p > 0.05$).

Table 1 Distribution of Journals with 2 or More Top 100 Cited Articles

Rank	Journals	Articles	Average Citations Per Year	Impact Factor	*r*	*p*
1	MIDWIFERY	15	80.85	1.778	0.092	>0.05
2	JOURNAL OF MIDWIFERY & WOMEN'S HEALTH*	9	55.08	1.742		
3	BIRTH-ISSUES IN PERINATAL CARE	7	43.82	2.705		
4	BMJ-BRITISH MEDICAL JOURNAL*	6	30.6	30.223		
5	LANCET	6	155.46	60.392		
6	BJOG-AN INTERNATIONAL JOURNAL OF OBSTETRICS AND GYNAECOLOGY	5	37.7	4.663		
7	BMC PREGNANCY AND CHILDBIRTH	4	44.32	2.239		
8	INTERNATIONAL JOURNAL OF NURSING STUDIES	3	21.09	3.783		
9	JOURNAL OF ADVANCED NURSING	3	10.95	2.561		
10	OBSTETRICS AND GYNECOLOGY	3	16.572	5.524		
11	PLOS ONE	3	54.81	2.74		
12	SOCIAL SCIENCE & MEDICINE	3	12.03	3.616		
13	AMERICAN JOURNAL OF PUBLIC HEALTH	2	13.28	6.464		
14	CANADIAN MEDICAL ASSOCIATION JOURNAL	2	22.72	7.744		
15	INTERNATIONAL JOURNAL OF EPIDEMIOLOGY	2	8.16	7.707		
16	SCANDINAVIAN JOURNAL OF CARING SCIENCES	2	11.82	2.34		
17	SEXUAL & REPRODUCTIVE HEALTHCARE	2	15.98	2.024		
18	SOCIOLOGY OF HEALTH & ILLNESS	2	6.72	3.041		
19	WOMEN AND BIRTH	2	22.14	2.308		

Notes: *As the journal title JOURNAL OF NURSE-MIDWIFERY had changed to JOURNAL OF MIDWIFERY & WOMENS HEALTH in 2000, BRITISH MEDICAL JOURNAL had changed to BMJ- BRITISH MEDICAL JOURNAL in 2000, the top-cited articles published on both journals has been combined, IF of the latter should prevail. *r* and *p* indicate that there is no linear correlation between journal IFs and average citations per year.

Country and Organisation Analysis

It is stipulated that the first author of an article determines the ownership of the intellectual property rights of that publication. The 100 top-cited articles were distributed in 18 countries. Australia published nearly a quarter of these articles (n = 24), followed by the USA (n = 15), England (n = 15) and Sweden (n = 11) (Figure 2).

Scientific research cooperation is an important driving force for the development of science and technology. It can not only improve the overall strength of scientific research teams but also effectively promote the exchange of knowledge among institutions and countries as well as share scientific research achievements. Countries that co-authored three or more articles are shown in Figure 3. The ranking of countries with active international cooperation is consistent with that of the countries with publications of the top-cited articles.

The University of Technology Sydney and La Trobe University in Australia top the article publication ranking, each contributing four papers, followed by Western Sydney University in Australia, the University of California–San Francisco in the USA and the University of British Columbia in Canada, each contributing three articles (Figure 4). Figure 5 shows the organisations that co-authored three or more articles. The University of Technology Sydney in Australia and King's College London in England were the top two most influential organisations according to co-authored publications.

Author Analysis

Ninety unique first authors contributed to the 100 top-cited articles. B Hunter published the most articles (n = 4), followed by Homer (n = 3). Table 2 summarises the co-authors who contributed three or more of the top 100 articles. The median number of all the authors was 4 (IQR: 2–6). The more times an article was cited, the more authors it had, on average ($r = 0.336$, $p < 0.05$).

Keyword Analysis

As the author keywords were not available for some selected articles, we used all keywords (including both author keywords and keywords plus) for the keyword analysis. A total of 310 keywords with different meanings were identified from the top-cited articles. The keywords were counted using VOSviewer, and clustering and time superposition maps were compiled. A keyword co-occurrence map was plotted to visualise the research trends and hotspots in a specific field.

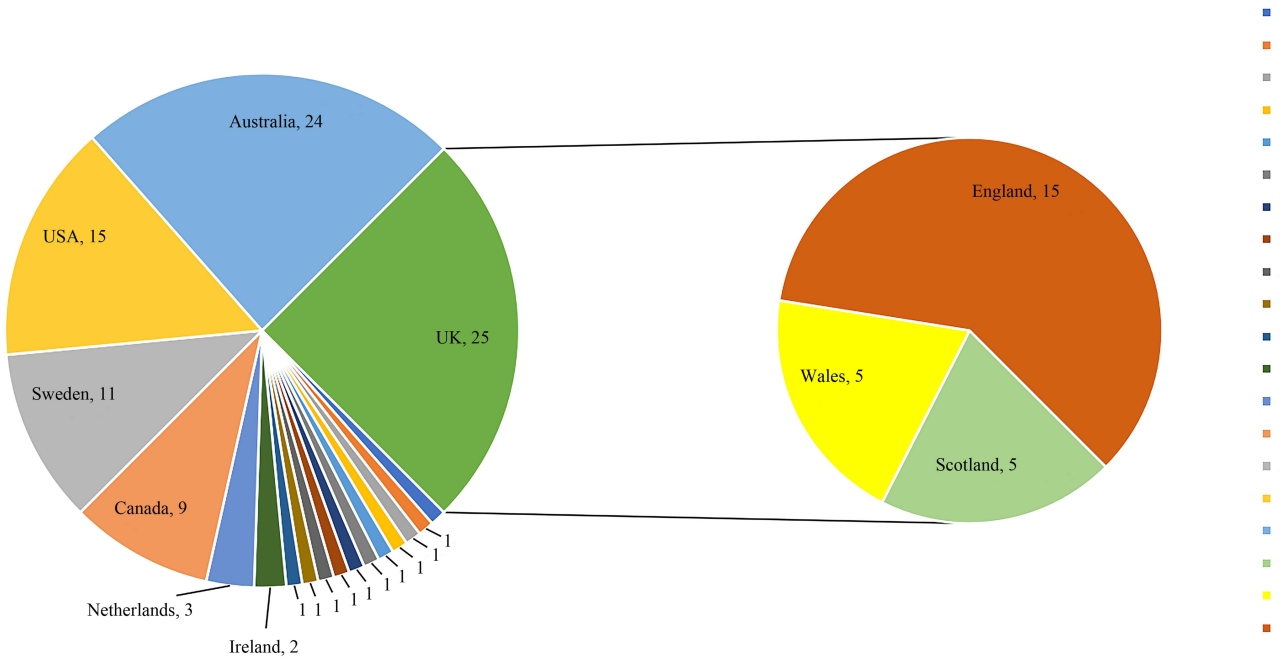

Figure 2 The country distribution of the 100 top-cited articles.

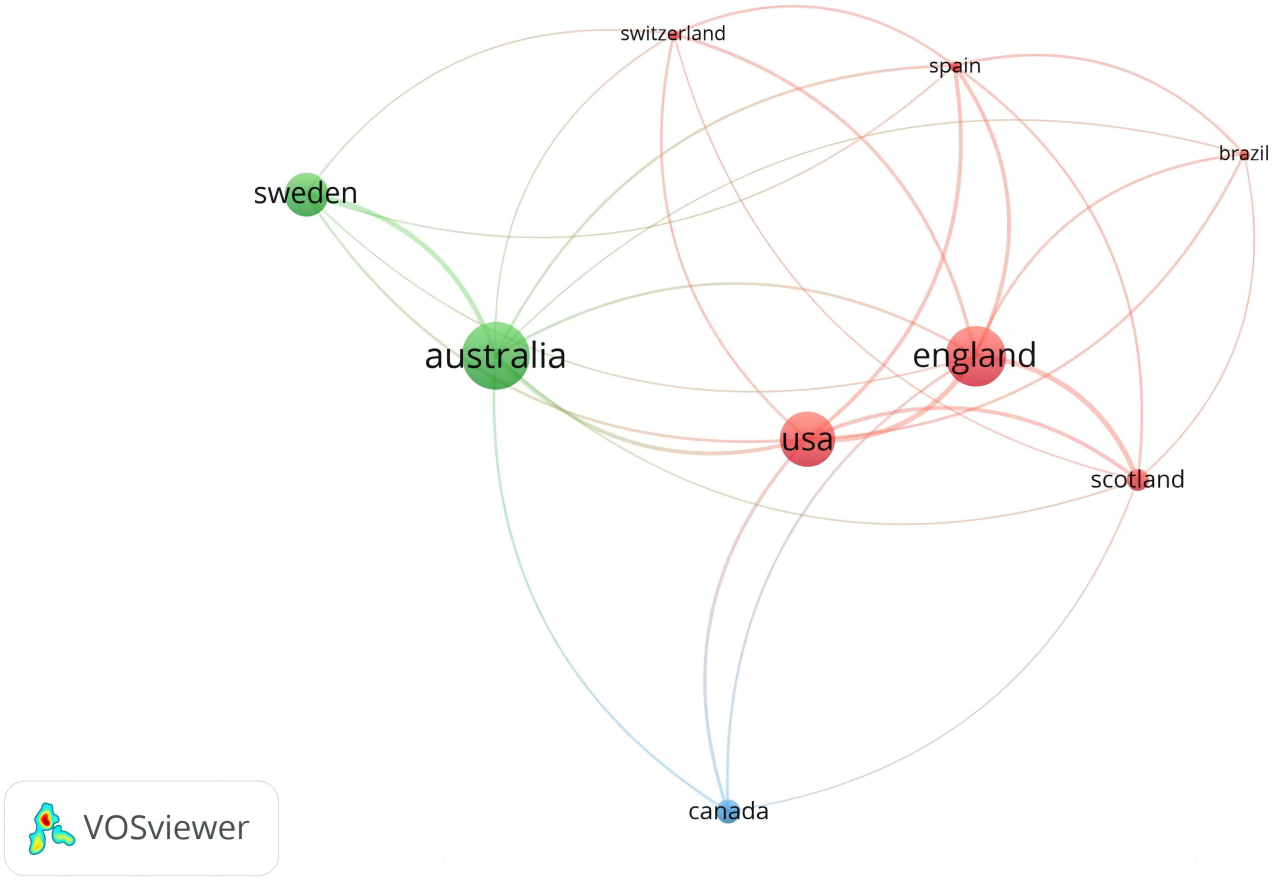

Figure 3 The network map of countries which coauthored three or more articles.

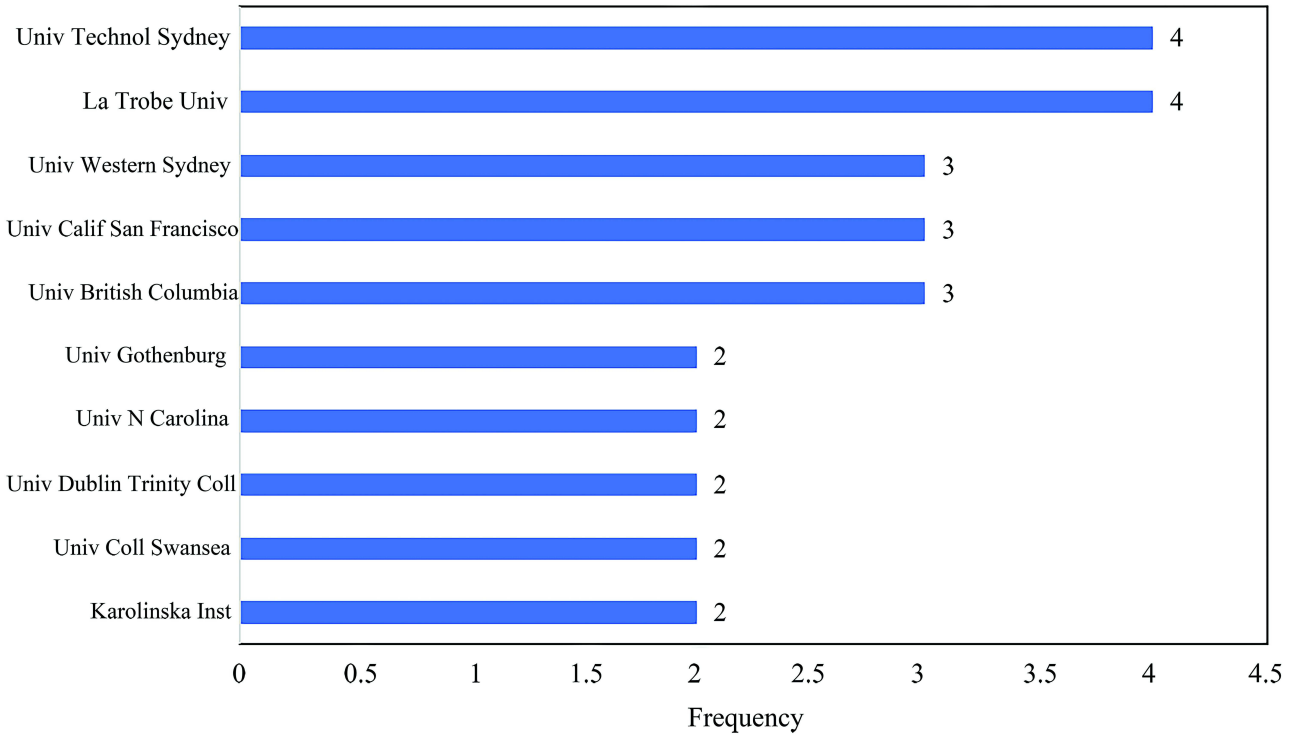

Figure 4 The organizations of two or more articles in the 100 top-cited articles.

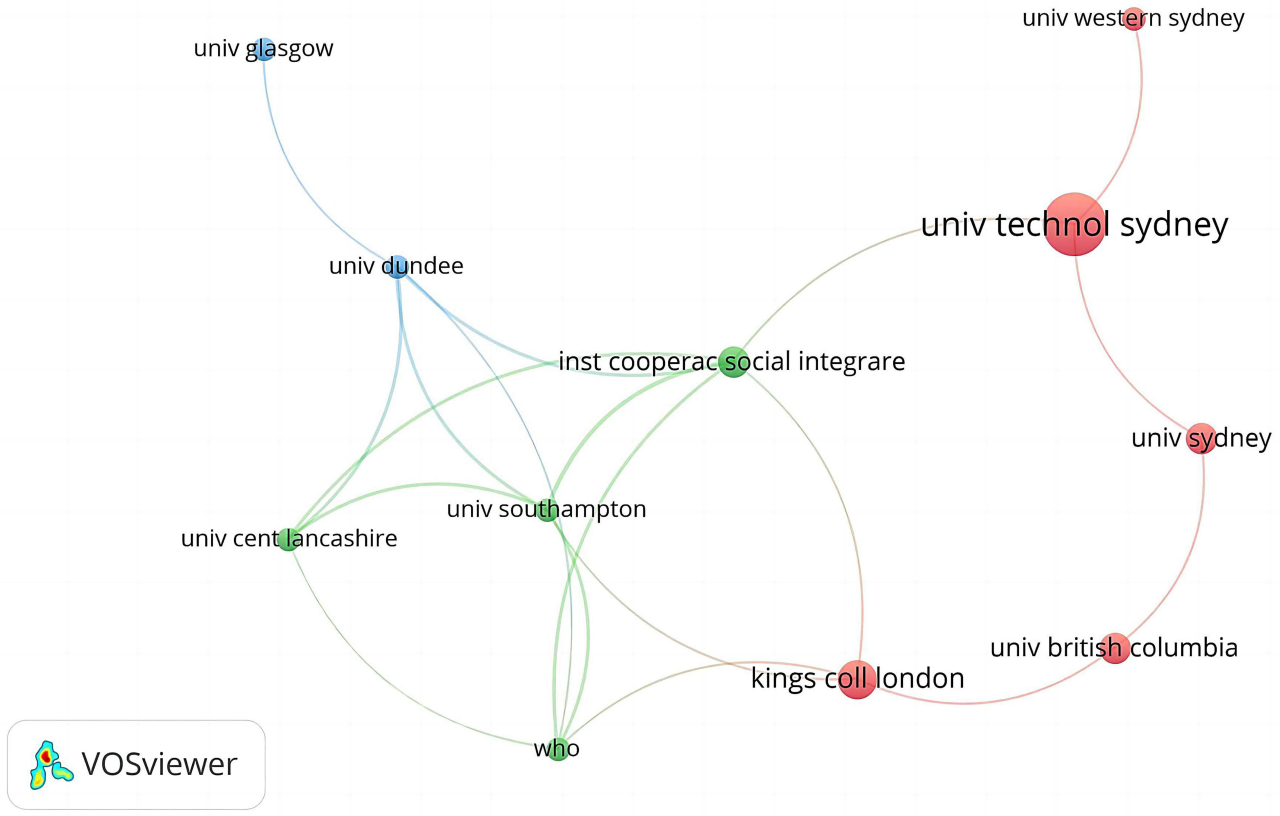

Figure 5 The network map of organizations which coauthored three or more articles.

The related research directions were divided into three categories (Figure 6): ① The green area represents the role of midwifery in childbirth, midwifery care during pregnancy and its impact on reducing the rate of perinatal mortality. Key words were "pregnancy, attitudes, perinatal-mortality, childbirth, midwives". ② The top three keywords in the red area were "nursing satisfaction", "work experience", "health" and "job burnout of midwifery". ③ The blue area represents the effect of midwifery' care in different stages of women's labour and delivery and related studies regarding Caesarean sections. Key words were "caesarean-section, labor". These three research directions are not unrelated but complementary, and they jointly outline the research and development process for midwifery. The time superposition map indicates that most of the early studies focused on the application of midwifery' nursing in pregnancy and delivery. Over time, the satisfaction of midwifery with nursing and the job burnout of midwifery gradually attracted attention. Figure 7 shows the keywords that co-authored five or more articles.

Table 2 The Authors of Three or More Articles as First Author or Coauthor

Author Name	Frequency		*r*	*p*
	As First Author	As Coauthor		
B Hunter	4 [32–35][a]	0	0.336	< 0.05
CSE Homer	3 [36–38]	3 [32, 33, 42]		
HP Kennedy	2 [39–40]	3 [32, 34, 43]		
U Waldenstrom	1 [41]	4 [47–50]		
J Sandall	0	3 [51–53]		
J Campbell	0	3 [54–56]		

Notes: [a]The sequence number of corresponding references. *r and p means that there is a linear correlation between the number of citations of articles and co-authors.*

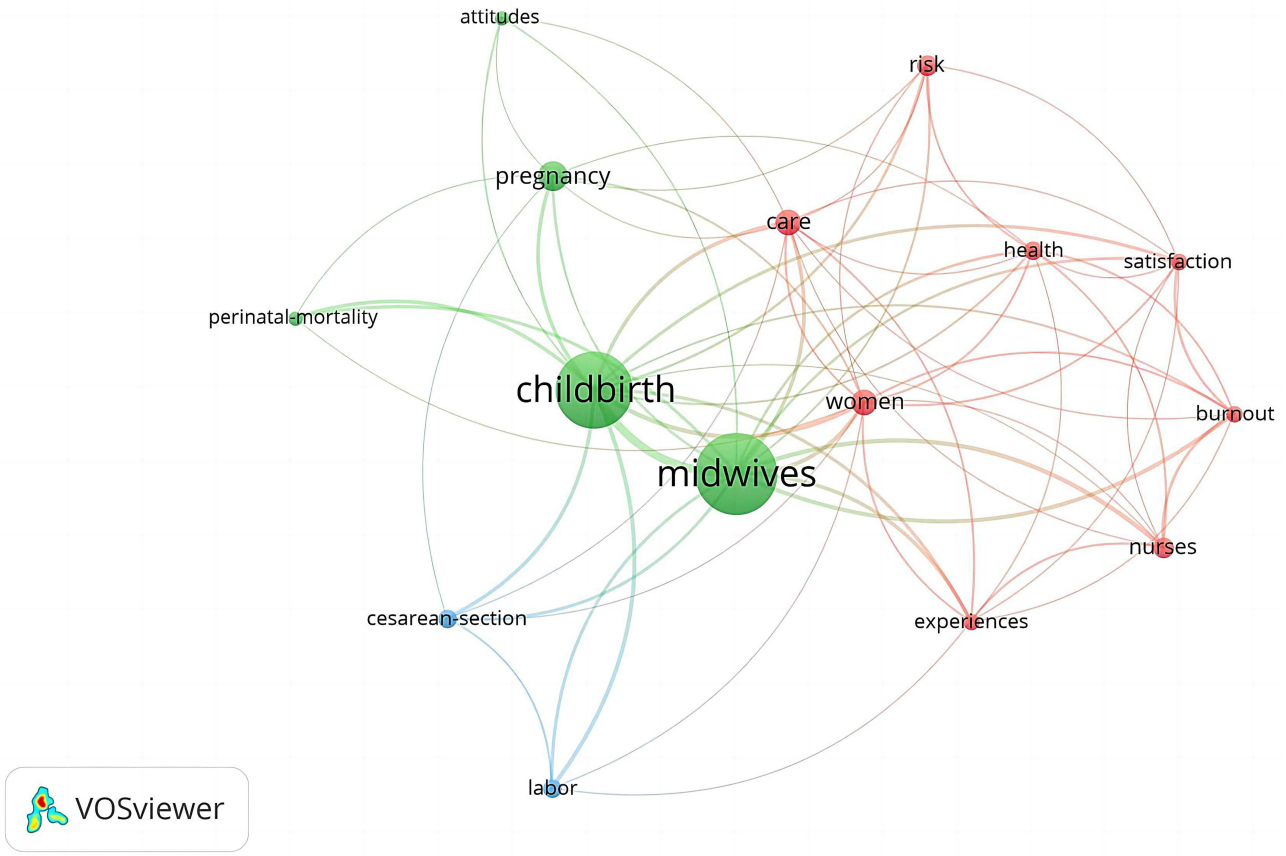

Figure 6 The network map of keywords which co-occurred five or more articles.

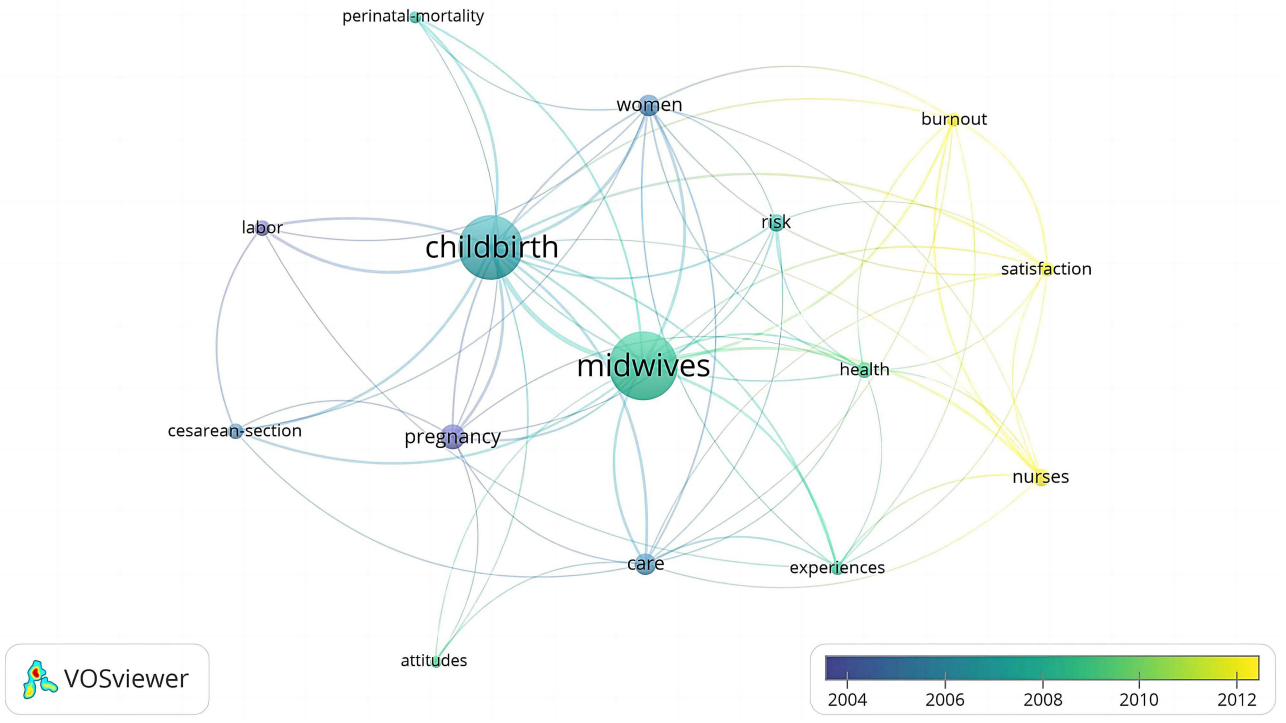

Figure 7 The time superposition map of keywords which co-occurred five or more articles.

Table 3 The Top 10 Total Link Strengths of Keywords, Organizations, and Countries

Rank	Keywords	TLS[a]	Co.oc[b]	Organizations	TLS[a]	To.ci[c]	Pub.no[d]	Countries	TLS[a]	To.ci[c]	Pub.no[d]
1	Midwifery	84	42	Comprehensive Institute of Social Cooperation	11	914	4	USA	28	2978	23
2	Childbirth	82	39	University of Southampton	10	776	3	England	28	2666	25
3	Women	31	10	Karolinska Institute	8	706	8	Australia	19	2520	28
4	Care	22	10	University of Dundee	8	728	3	Scotland	17	1326	9
5	EXPERIENCES	21	6	La Trobe University	7	471	5	Spain	17	914	4
6	Burnout	20	6	University Of Central Lancashire	7	738	3	Sweden	11	1477	18
7	Nurses	19	8	World Health Organization	7	407	3	Switzerland	10	407	3
8	Health	17	7	King's College London	4	512	5	Brazil	8	658	3
9	Labor	17	7	Monash University	4	335	4	Canada	8	1046	10
10	Pregnancy	17	12	University of Melbourne	3	246	3	Wales	0	415	5
11	Satisfaction	17	6	University of Technology Sydney	3	781	8	Netherlands	0	197	3
12	Cesarean-section	14	7	University of British Columbia	2	486	4	/	/	/	/
13	Perinatal-mortality	11	5	University of Technology Sydney	2	382	4	/	/	/	/
14	Risk	11	8	University of Glasgow	1	263	3	/	/	/	/
15	Attitudes	8	5	Western Sydney University	1	198	3	/	/	/	/
16	/	/	/	University of Gothenburg	0	256	3	/	/	/	/
17	/	/	/	University of California, San Francisco	0	215	3	/	/	/	/

Notes: [a]Total Link Strengths, [b]Co-occurrence, [c]Total citations, [d]Publication number.

Total Link Strength Analysis

The total link strength is the sum of the link strengths of one node over all the other nodes, and it functions as a standard to measure attributes.[23] Therefore, keywords, organisations and countries with high total link strengths were considered leading keywords in midwifery' research, and they formed the network hub of the co-occurrence map. The top 10 total link strengths of the keywords, organisations and countries are shown in Table 3, with three as the minimum number of publications. "midwifery" and "childbirth" were the top two keywords with the strongest total link strength (147 and 138, respectively) and were also the top two keywords with the highest co-occurrences (42 and 39, respectively). This finding was consistent with the result displayed in the keyword co-occurrence map (Figure 6). In terms of organisations, the Comprehensive Institute of Social Cooperation in Spain had the strongest link strength (11) and the highest number of total citations (914), followed by the University of Southampton in England (link strength: 10, total citations: 776). Among the 10 organisations, the Karolinska Institute in Sweden co-authored the most publications (8). In terms of countries, the USA, England and Australia were the top three countries with the strongest total link strength (28, 28 and 19, respectively), the most co-authored documents (23, 25 and 28, respectively) and total citations (2666, 2978 and 2520, respectively).

Discussion

A citation analysis can provide a great deal of information about journals, organisations, authors, etc., and it can summarize high-impact papers and influential journals.[126–129] It provides a historical perspective on the scientific process as well as the investigative trend in the field of midwifery A bibliometric analysis applies quantitative and statistical analyses to describe patterns observed in specific publications and can help to identify previous, current and future major advances in biomedical research.[130–132] This bibliometric study described the 100 top-cited articles on the theme of midwifery and analysed the distribution of these articles in terms of citation ranking, publication year, journal, country, organisation, authorship, keywords and the total link strength of countries, organisations and keywords. Furthermore, visualised network maps were used to explore keyword co-occurrence and co-authorship by country and organisation.

Basic Characteristics

The 100 included articles published between 1988 and 2018 were cited 55 to 484 times. The most-cited article, by Garfield, was published 33 years ago (in 1988), which explains the time bias of total citations. More than half of these articles (n = 68) were published a decade ago, and none published in the past 5 years appeared in the top 30. Hence, these articles were rearranged based on average citations per year. Consequently, a visualised map of midwifery across the USA published in average citations ranked 3rd, while in terms of total citations, it ranked only 46th.[71] Similarly, two articles published in 2016 and 2017 ranked much higher (from 34th to 8th and from 56th to 7th, respectively) based on average citations per year.[59,81] Moreover, according to the average citations per year compared with total citations, more articles were published in the past decade.

Typically, scientific articles begin to be substantially cited 1–2 years after publication, reach a maximum after 3 to 5 years and then decrease to a lower level.[133] Consequently, with high average citations, articles published in recent years may reflect the emerging research trends in the field of midwifery, contributing more citations over time, as with the three articles above.

Journal Distribution

The publishing theme of 15% of the 100 top-cited articles was midwifery. Journals with high IFs (the lower quartile of the IFs was 5.15) published nearly one-third of the 100 articles. Thirteen of the top-cited articles were published in the top three journals with an IF higher than 30 (JCR division Q1). However, 16 different journals with an IF lower than 5 published one-fifth of the selected articles. Furthermore, there was no linear correlation between journal IF and average citations per year. This finding demonstrates that journal IF does not represent the level of an article but the evaluation of the overall academic level of the journal.[134,135] Therefore, when evaluating scientific research achievements, we should comprehensively consider both journals' IFs and article citations.

Country and Organisation

Australia contributed nearly a quarter of the top-cited articles, and it occupied the centre of the country co-authorship visualisation map, reflecting its close collaboration with other countries, such as England, the USA and Sweden. This result shows the principal academic status of Australia in midwifery. Notably, the USA and England were tied in terms of publishing the second-highest number of the top 100 articles and were the top two countries with the strongest total link strength (both 28), which was also indicated by their short distances from other nodes in the country co-authorship visualisation map. This finding confirms the tremendous impact of both countries on midwifery' research. In contrast, as the co-authorship map shows, although Spain and Switzerland contributed few articles, they actively collaborated with other countries. The statistical results showed that the total article citations were relevant to both publications and total link strength. However, Asian countries are not represented on the co-authorship map. Thus, improve the midwifery research level, they should deepen their cooperative relationship with Australia, the USA and European countries.

The three organizations with the 11 top-cited articles were from Australia, 8 of which were published by Three organizations published 11 top-cited articles, 8 of 11 were published by two organizations, they are the Nursing & Midwifery School and the Mothers & Children's Health Study Centre, which may be attributed to the high academic degree-level education of midwifery in Australia.[136] The top two influential organisations in the organisation co-authorship network map were the University of Technology Sydney in Australia and King's College London in England. Notably, although few top-cited articles originated from the University of Central Lancashire, the University of Southampton and the University of Dundee in the UK as the first affiliation, they had strong collaborative links with other dominant organisations. Moreover, the top 10 total link strengths of organisations, most of which were from European countries, such as England, Spain and Sweden, were correlated with total citations. These results suggest that Australia and many European countries are at the frontier of midwifery' research and cooperate well to yield high-quality articles.

Core Authors

B Hunter, who published four papers that have been cited 337 times, was the most productive and cited author. Homer CSE, Kennedy HP and Waldenstrom U were prolific authors in the midwifery field both as first authors and co-authors. Although Sandall J and Campbell J were not identified as the first authors of any of the selected articles, they were actively involved in academic cooperation networks and played an important academic role in this field. More than half of the 100 articles were finished by four or more authors (the median number of co-authors was four), and the average citations were positively linearly correlated with the number of co-authors, indicating a trend of enhanced cooperation among high-quality articles.

Study Hotpots

Considering the nursing nature of midwifery, articles related to "nursing" were identified prominently in the top-100 list (n = 45). As midwifery have developed, the competency and training modes of midwifery, which are categorised as "obstetrics & gynaecology", have been well studied, and they accounted for 16 papers. Furthermore, studies on occupational adaptation, which plays a vital role in "public, environmental and occupational health", accounted for 14% of the list. The above conclusions confirmed the keyword analysis results. According to the keyword co-occurrence and time superposition maps, in the early years, the midwifery' research focused mainly on the application of midwifery nursing in clinics. Midwifery' occupational health emerged as a new research hotspot.

Total Link Strength

The link strength between two nodes denotes the frequency of co-occurrence and can be used as a quantitative index to describe the relationship between two nodes.[137] According to the total link strength of the top 10 keywords, the total link strength and co-occurrences had a linear correlation. In the co-authorship analysis, the link strength between organisations or countries represents the number of co-authored articles.[138] The total link strength of the top 10 organisations was correlated with total citations but not with publication number. For countries, the total link strength was correlated with both total citations and the number of publications.

Citation Bias

Considering that articles' citations generally rely on publication time, the time of issuance can significantly affect the number of times an article is cited.[131,132,139] The included articles were published between 1988 and 2018, and the analysis demonstrated that most (86) of the top-cited papers on midwifery were published from 1996 to 2015. This finding is comparable with that of another bibliometric analysis,[140] which demonstrated that generally, the final impact of an article usually cannot be precisely measured for at least 20 years after its publication. Additionally, classic papers may be cited less day by day since their research findings have become accepted truth and are embedded in daily clinical practice.[141]

Strengths and Limitations

A strength of our research is that we analysed the total link strength of keywords, organisations and countries, which can reflect the leading ones of the top-cited articles. Then, we listed the authors, journals, keywords, countries and organisations in detail. Finally, we performed statistical analyses to determine the underlying factors that may be related to citation counts.

Our research has some limitations. First is the inherent time bias referred to when relying on the number of citations of an article, which could preferentially favour older papers.[142] Second, the language of the papers was restricted to English; thus, studies written in other languages may have been omitted. Third, only the WOS was searched for data collection purposes, and other databases, such as PubMed, were not analysed.

In summary, this bibliometric analysis of the 100 top-cited articles distinguishes the major advances and research trends in the field of midwifery that disseminate midwife-led clinical research, develop nurse and midwife researchers and highlight the direction of midwifery' education and training.

Conclusion

Our study identified articles responsible for the most significant developments in research on midwifery. The core journals for midwifery are *Midwifery* (IF = 1.778), *The Journal of Midwifery & Women's Health* (IF = 1.742) and *Birth: Issues in Perinatal Care* (IF = 2.705). The most productive country is Australia, and the most productive organisations (The University of Technology Sydney and La Trobe University) and author (Hunter B from Wales) are based there. Midwifery' occupational health, including their physical and mental health, could be future research hotspots.

Data Sharing Statement

The data used to support the findings of this study are available from the corresponding author upon request.

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Disclosure

The authors declare that they have no conflicts of interest.

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