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REVIEW

Global Trends in Neurosurgical Nursing Research from 2014 to 2024: A Bibliometric and Visualization Study

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Abstract: As neurosurgical nursing continues to evolve alongside technological advancements, a systematic examination of its research landscape has become increasingly imperative. This study employed bibliometric analysis to investigate global research trends in neurosurgical nursing from 2014 to 2024, utilizing 5677 records extracted from the Web of Science Core Collection (WOSCC). Through the application of bibliometric techniques and CiteSpace visualization tools, we quantitatively analyzed publication outputs, geographical distributions, institutional contributions, and keyword evolution patterns. Our temporal analysis revealed three key findings: (1) a steady annual growth in publication volume (average increase of 12.3% per year), with the United States contributing 39.90% of total publications; (2) dominant institutional contributors including Harvard University, the University of California System, and the University of Toronto, which collectively accounted for 28.5% of high-citation publications; and (3) emerging research foci centered on seven primary themes: clinical interventions ("clinical article", "external ventricular drain"), patient populations ("neurosurgical patients"), treatment modalities ("radiotherapy"), evidence synthesis ("meta analysis"), care delivery models ("patterns"), and anatomical considerations ("central nervous system"). These findings provided empirical evidence for understanding current research priorities, identifying knowledge gaps, and forecasting future developmental trajectories in neurosurgical nursing. The study established a foundational bibliometric framework that may guide strategic research planning and international collaboration in this specialized nursing field.

Keywords: nursing, neurosurgery, text-mining study, bibliometric analysis

Introduction

Neurosurgical nursing represented a vital aspect of neurosurgical healthcare systems and has experienced significant advancements in recent years across various aspects, driven by technological innovations and evolving nursing paradigms.[1] Nevertheless, the field continued to grapple with ongoing challenges, including the optimization of interdisciplinary team collaboration, providing care for patients with language barriers, managing caregiver burnout, fostering a culture of nursing safety, improving cross-regional communication efficiency, and conducting risk assessments for elderly neurosurgical patients.[2,3] Although existing research has addressed some of these issues, there was a pressing need for further integration and detailed analysis to effectively respond to the increasing complexity of clinical care demands.

Neurosurgical nursing research held significant clinical and practical value, as it directly influenced patient treatment outcomes and recovery quality. By optimizing perioperative care protocols, preventing complications such as intracranial infections and deep vein thrombosis, and improving pain management, neurosurgical nursing demonstrated the capacity to significantly reduce postoperative mortality and hospital readmission rates. Studies showed that specialized neurosurgical care teams could shorten the average hospitalization duration for brain tumor patients while simultaneously improving patient satisfaction scores.[4,5] Furthermore, with the advancement of minimally invasive surgery and precision

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medicine, nursing professionals were required to master more complex technical procedures including intracranial pressure monitoring and ventricular drainage care, which proved crucial for enhancing surgical success rates and long-term prognosis. Contemporary clinical practice faced multiple challenges, including: 1) insufficient care continuity due to imperfect multidisciplinary collaboration mechanisms; 2) difficulties in preventing and controlling the high incidence of postoperative delirium in elderly patients (>65 years old); 3) gaps in specialized nursing training in resource-limited regions such as developing countries; and 4) ethical and safety concerns in the application of emerging technologies like robotic-assisted surgery.[6,7]

The initial development of neurosurgical nursing was grounded in the specialization of neurosurgical care. For example, the Neurosurgery Department at Kyushu University in Japan became autonomous from general surgery in 2000 and subsequently established a multidisciplinary collaborative framework that included nursing teams.[8] In 2006, Australian neurosurgical pioneer Kenneth Jamieson championed the creation of "more standardized clinical teaching systems", stressing the necessity to "elevate neurosurgical nursing standards", which provided a foundation for specialized nursing education. With advancements in critical care technologies, neurosurgical nursing began to prioritize the prevention of complications. The establishment of the Australian Resuscitation Council signaled the onset of systematic training in life-support techniques.[9] Following 2010, research increasingly focused on postoperative management, such as optimizing nursing protocols for the early evacuation of epidural hematomas and monitoring patients post-aneurysm surgery, reflecting the dynamic evolution of research within the field of neurosurgical nursing.[10]

Bibliometric analysis, which employed mathematical and statistical techniques to visualize research patterns, including clustering and temporal trend analyses, is widely utilized to evaluate research hotspots and emerging frontiers.[11] Despite its broad application across various disciplines, bibliometric studies specifically focusing on neurosurgical nursing remain limited. The conduct of bibliometric analysis proved essential for advancing neurosurgical nursing development. The present study systematically examined 5677 publications over the past decade (Web of Science data), revealing three core contributions: firstly, it identified evolutionary trajectories of research hotspots, such as the shift from traditional postoperative care to AI-assisted decision-making, thereby enabling clinicians to track cutting-edge developments; secondly, it quantified the knowledge production dominance of leading institutions like Harvard University, offering empirical evidence for resource allocation; third, it uncovered critical research gaps, particularly the disproportionate contribution pattern where 72% of low-income countries accounted for merely 9% of total publications, thereby directing priorities for future international collaboration. The bibliometric approach further enabled objective evaluation of evidence bases underlying clinical guidelines, exemplified by the finding that only 18% of existing studies provided high-quality evidence regarding "external ventricular drain infection prevention". These analytical outcomes furnished data-driven foundations for establishing standardized care pathways and optimizing education systems, ultimately contributing to improved patient outcomes and more equitable distribution of healthcare resources.

Materials and Methods

Data Collection and Search Strategy

The information utilized in this research was meticulously sourced from the Web of Science Core Collection (WOSCC), a globally esteemed repository of scholarly literature. The employed search methodology was formulated as follows: [TS= ((neurosurgery) OR (neurosurgical) OR (neurosurgical care) OR (neurosurgical nursing) OR (neurosurgery nursing)) AND TS=((nursing) OR (nurse care) OR (patient care) OR (healthcare) OR (clinical nursing))]. To guarantee an extensive overview of advancements in postoperative care technologies pertinent to neurosurgery patients, we delineated the subsequent inclusion criteria: (1) Timeframe: Publications from January 2014 to December 2024 were incorporated to encompass both historical trends and novel innovations. (2) Document Types: Only peer-reviewed papers (designated as "Article") and review articles ("Review") were chosen to emphasize scientifically validated findings. (3) Language Limitation: Only studies published in English were included to align with the primary language utilized for disseminating technological research (The workflow was illustrated in Figure 1).

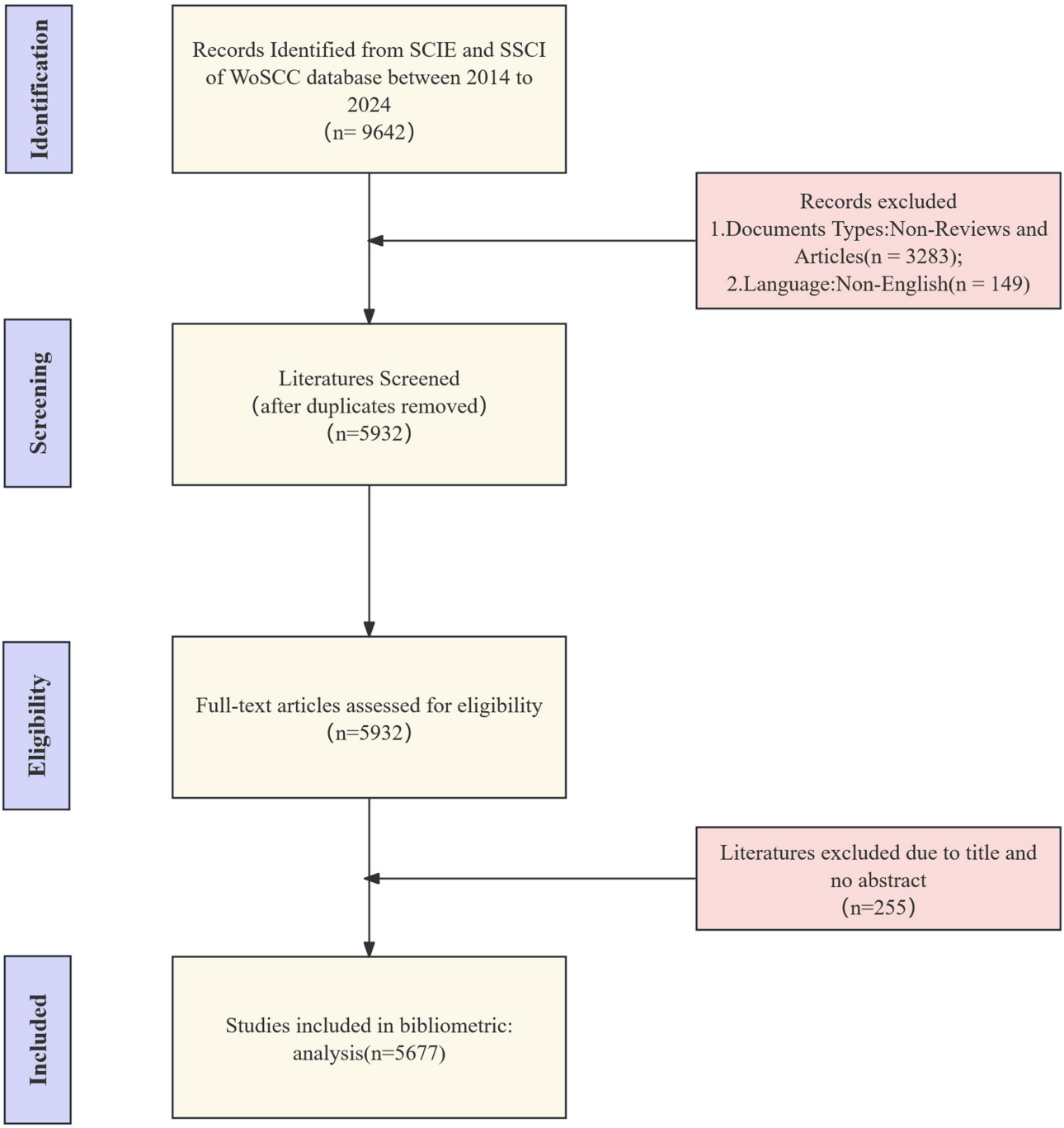

Figure 1 The flow diagram of literature enrollment and data screening.

Software for Bibliometric Analysis and Visualization Analysis

The R package "bibliometrix" (version 4.3.0) (https://www.bibliometrix.org) was utilized for bibliometric examination, creating a global distribution network of literature associated with neurosurgical nursing through multidimensional data mining encompassing journals, authors, citations, keywords, institutions, and both national and international co-occurrence networks. Data extraction was performed utilizing Web of Science export files containing comprehensive metadata records, with subsequent analyses executed using R (version 4.3.2) (https://www.r-project.org/) and bibliometrix functions. The preliminary data interpretation was conducted employing the "biblioAnalysis()" command and

"summary()" function, producing metrics such as: temporal publication distribution, document types, average publication year, citations per document, author counts, single versus multiple author ratios, affiliations of corresponding authors by nationality, country-specific citation metrics, leading journals, and frequently occurring keywords.

Collaboration networks were scrutinized through the "metaTagExtraction" and "Biblionetwork" commands. The "biblioshiny()" interface enabled supplementary analyses, including: patterns of national scientific collaboration, institutional networks, evolution of keywords, synthesis of co-occurrence networks, and thematic mapping. Core bibliometric characteristics were systematically charted through the iterative execution of package-specific algorithms, ensuring reproducibility in network topology and metric calculations.

Results

Analysis of Annual Publishing Trends

A cumulative total of 5677 articles that adhered to the defined inclusion and exclusion criteria were published from 2014 to 2024, exhibiting an annual growth rate of 12.29% (the article lists were showed in Supplementary Table 1). Data sourced from the WoSCC database indicated that 28,459 authors affiliated with 3079 institutions across 99 countries/regions produced 5677 papers published in 1177 academic journals. As illustrated in Figure 2A, there was a general upward trend in the volume of publications, despite experiencing occasional declines at specific intervals. Notably, interest in the domain of neurosurgical nursing surged, with 3699 publications during this five-year span, representing over 50% of the aggregate publications.

Contributions of Countries/Regions and Institutions

The publications emerged from a total of 99 countries/regions and 3079 institutions. As depicted in Table 1 and Figure 2B, the United States led in publication output with 2265 articles (39.9%), followed by China (406, 7.2%), the UK (361, 6.4%), and Germany (264, 4.7%). Figure 3A illustrated the collaborative networks among countries/regions. Betweenness centrality quantified how often a node acted as a connector along the shortest path between two other nodes; thus, a node's betweenness centrality increases with its frequency of serving as an intermediary. The leading five countries/regions, ranked by their betweenness centrality scores, were the USA (17.35), the UK (9.21), Germany (3.66), Italy (2.27), Canada (1.68), and the Netherlands (1.58). Consequently, the USA emerged as the most influential country in this domain based on both publication volume and betweenness centrality.

Table 2 outlines the ten most productive institutions. Harvard University topped the list with 514 publications, marking it as the most significant contributor in this area, followed closely by the University of California System (500), Harvard Medical Affiliates (382), the University of Toronto (366), and the University System of Ohio (301). The institutional cooperation network map is provided in Figure 3B, demonstrating active collaborations among various institutions, including Harvard University, Harvard Medical School, Harvard Medical Affiliates, and the University of California System. Remarkably, all top ten institutions are situated in economically advanced nations, particularly in the USA, Canada, and the UK.

Author Productivity and Research Collaboration in Neurosurgical Nursing

A total of 28,459 authors have made contributions to this field. Table 3 lists the ten most productive scholars, with Hutchinson PJ from the University of Cambridge leading the way with 37 publications, followed by Park KB and Smith TR from Harvard Medical School with 31 and 29 publications, respectively, and Kolias AG from the University of Cambridge with 28 publications, alongside Malhotra NR from the University of Pennsylvania, also with 28 publications. In terms of citations, Cunningham CT ranked first with 737 citations, trailed by Frontera JA (484) and Krauss JK (467). These findings indicate substantial contributions from these authors to the field. Notably, several academic teams have emerged as key players, as illustrated in Figure 4, highlighting close collaborations within the same cluster, such as between Park KB and Enam SA, as well as Kolias AG and Marcus HJ. Furthermore, active cooperation among different clusters was evident, including partnerships such as Kolias AG and Park KB, Bydon M and Bekelis K, and Malhotra NR and Glauser G.

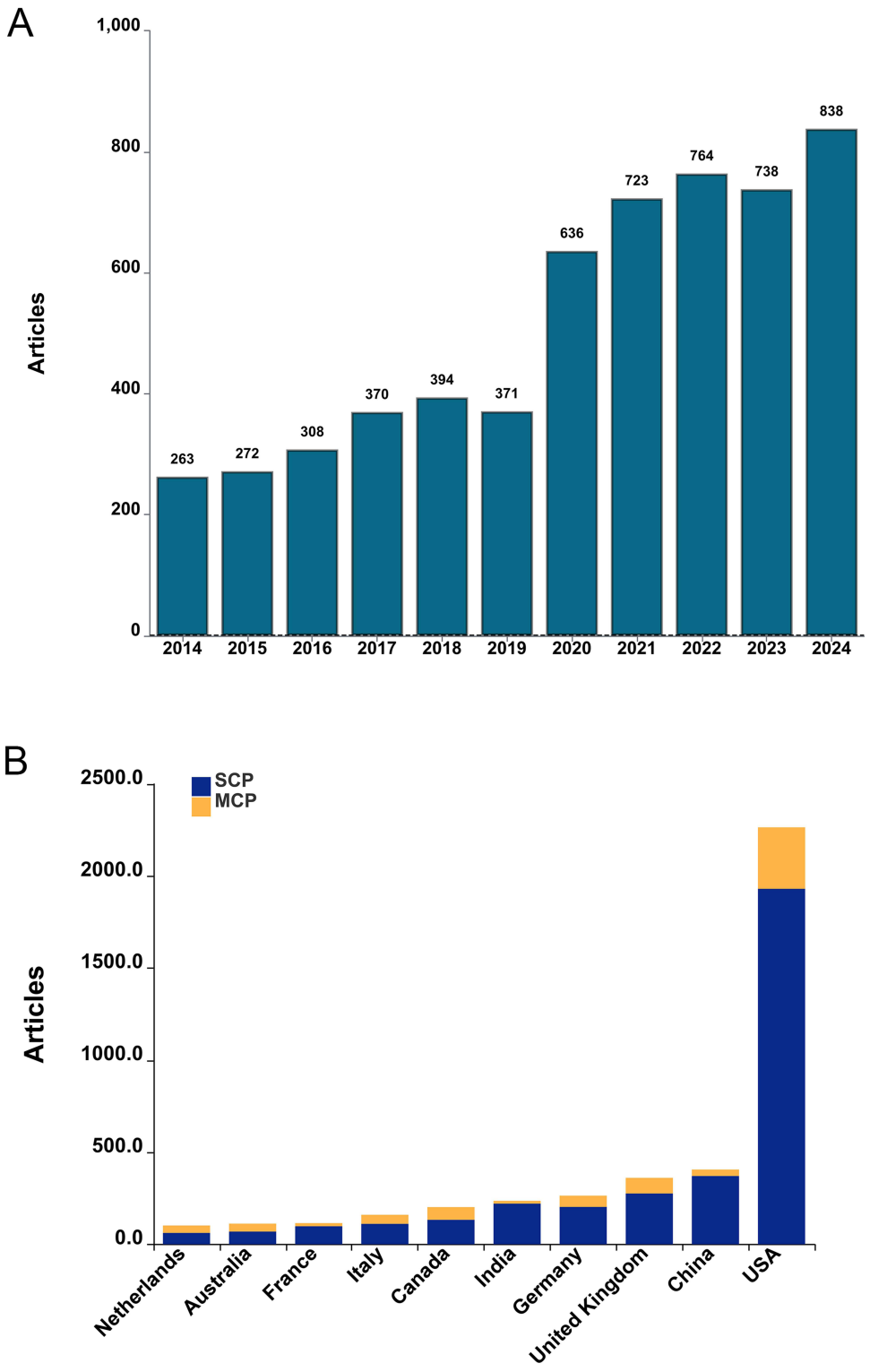

Figure 2 Temporal trends in neurosurgical nursing publications (2014–2024) and leading contributing countries. (**A**) Change trend of annual number of publications related to the research on neurosurgical nursing from 2014 to 2024. (**B**) The top 10 most productive countries related to neurosurgical nursing.

Analysis of Core Journals in Neurosurgical Nursing

Academic journals represented a vital platform for disseminating scientific research findings. The 5677 publications included in this study were distributed across 1177 academic journals. Table 4 outlined the characteristics of the ten most productive journals. Among these, the top ten journals accounted for 1758 publications, representing 30.97% of the total

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Table 1 Ranking of Top-10 Countries That Have Published the Most Article

Rank	Country	Betweenness	Article Counts
1	USA	17.353	0.034
2	China	9.205	0.034
3	United Kingdom	3.655	0.034
4	Germany	2.268	0.034
5	India	1.677	0.033
6	Canada	1.583	0.033
7	Italy	1.309	0.034
8	France	0.957	0.033
9	Australia	0.799	0.034
10	Netherlands	0.708	0.032

articles published. Most of these journals focused on the field of neurosurgical nursing, with the most influential journal being *World Neurosurgery* (599 publications), followed by the *Journal of Neurosurgery* (217). The *Cureus Journal of Medical Science* ranks 179th, with six of the top ten journals situated in the third quartile (Q3), all exhibiting an impact factor (IF) of less than 4.0. Based on co-citation analysis, the three leading journals in this domain are *World Neurosurgery* (7563), *Neurosurgery Focus* (4446), and the *Journal of Neurosurgery* (3164).

Analysis of Keyword Co-Occurrence and Bursts

Examining the co-occurrence of keywords allows for the identification of prominent research areas within a specific field of study. A total of 10,512 keywords were analyzed, revealing that 143 of them appeared more than 20 times. Figure 5A depicted the visualization map of keyword co-occurrences, where the size of each node corresponded to the frequency of the keywords. The five keywords with the highest frequency of co-occurrence were "neurosurgery" (1295), "traumatic brain injury" (412), "COVID-19" (219), "stroke" (145), and "craniotomy" (134). Cluster analysis of these keywords enabled the determination of the underlying structural system of related research fields. All keywords were categorized into twelve distinct groups, denoted by different colored circles, based on the strength of their co-occurrence links (Figure 5B). This thematic categorization comprises "risk factors", "spine surgery", "global neurosurgery", "management", "subarachnoid hemorrhage", "intensive care unit", "glioblastoma", "traumatic brain injury", "telehealth", "pediatric neurosurgery", "global neurosurgery", "deep brain stimulation", and "artificial intelligence".

Keyword bursts can provide insights into the evolving trends within the discipline. Figure 5C illustrated the top 22 keywords exhibiting the most significant citation bursts. Between 2014 and 2024, the term "clinical article" demonstrated the highest burst strength (24.55), closely followed by "neurosurgical patients" (19.53) and "meta analysis" (16.92). Furthermore, terms such as "radiotherapy", "patterns", "external ventricular drain", and "central nervous system" maintained bursts extending into 2024, reflecting the latest research directions.

Analysis of Co-Cited References and Reference Bursts

The analysis of co-cited references pertained to those that multiple publications reference concurrently, thereby constituting the foundational knowledge within a specific domain. Table 5 listed the ten most co-cited articles, all of which were referenced over 25 times. The study conducted by Dewan et al[4] in *Journal of Neurosurgery* (78) holds the

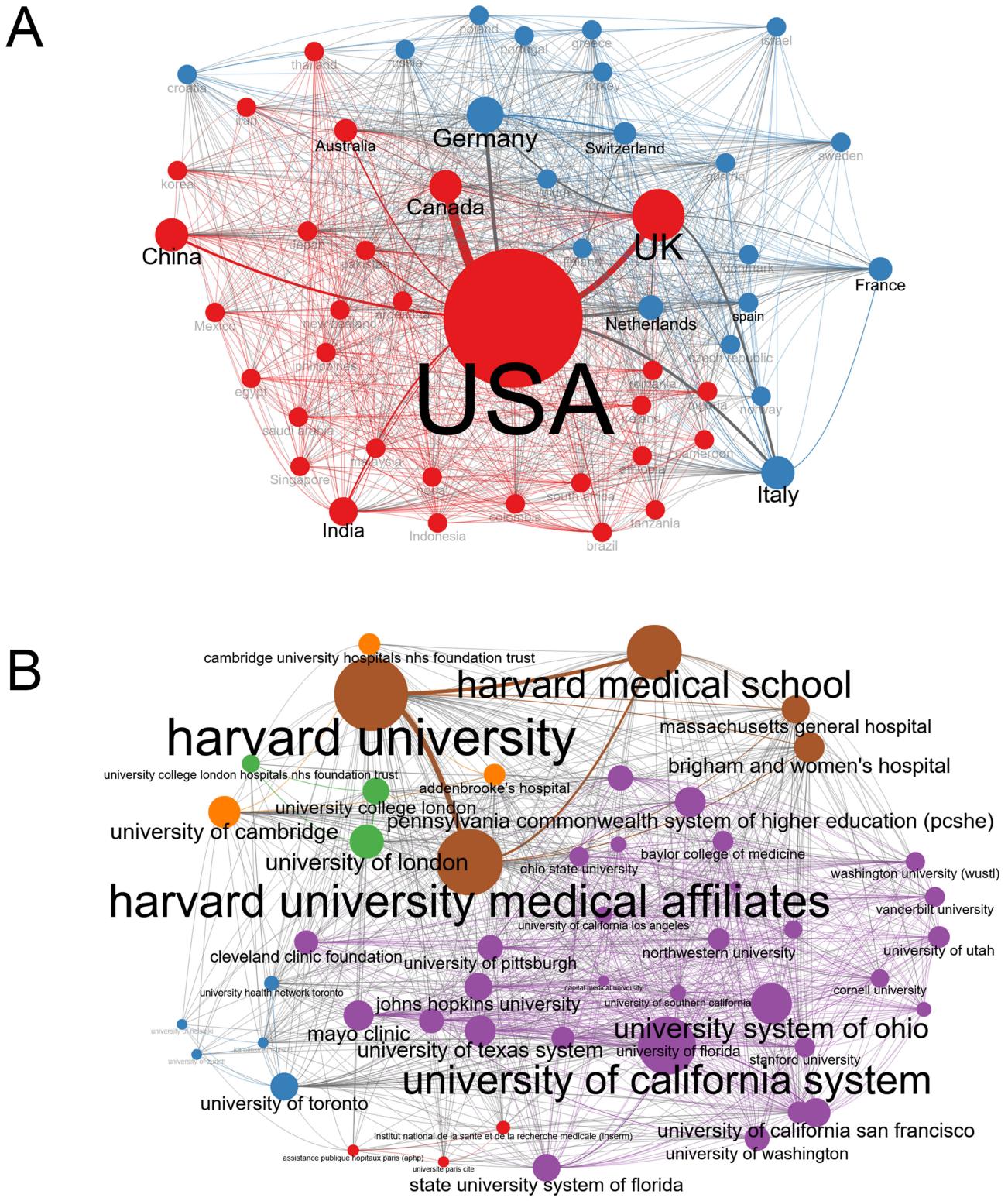

Figure 3 Visualization of international collaboration networks and institutional linkages in neurosurgical nursing research. (**A**) Cooperation network of prolific countries/regions. (**B**) Visualization map of institutions' cooperative relations.

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Table 2 Ranking of Top-10 Institutions

Rank	Institution	Country	Betweenness	Article Counts
1	Harvard University	USA	1.03	514
2	University of California System	USA	1.221	500
3	Harvard University Medical Affiliates	USA	0.626	382
4	University of Toronto	Canada	0.296	366
5	University System of Ohio	USA	0.585	301
6	Mayo Clinic	USA	0.075	282
7	University of London	UK	0.589	276
8	Harvard Medical School	USA	0.28	262
9	University of Cambridge	UK	2.067	252
10	Duke University	USA	0.272	243

Table 3 Ranking of Top-10 Most Productive Authors

Rank	Author	From Institution	Article Counts	Centrality Score	Total Number of Citations	Average Number of Citations
1	Hutchinson PJ	University of Cambridge	37	0.024	92	2.49
2	Park KB	Harvard Medical School	31	0.032	170	5.48
3	Smith TR	Harvard Medical School	29	0.022	164	5.66
4	Kolias AG	University of Cambridge	28	0.024	63	2.25
5	Malhotra NR	University of Pennsylvania	28	1	81	2.89
6	Haglund MM	Duke University Health System	27	0.075	108	4.00
7	Bydon M	Mayo Clinic Hospital	26	0.029	30	1.15
8	Agarwal N	University of Pittsburgh	24	0.022	39	1.63
9	Lawton MT	Barrow Neurological Institute	23	0.029	65	2.83
10	Berger MS	University of California, San Francisco	22	0.022	101	4.59

highest citation count, trailed by Jean et al[5] in *Acta Neurochirurgica* (60) and Tunkel et al[12] in *Clinical Infectious Diseases* (58).

Identifying references with citation bursts can reveal the temporal evolution of research hotspots and prospective trends in a particular field. Figure 6A showcased the top 16 references with the most substantial citation bursts. The reference with the strongest burst (23.14), titled "Guidelines for the Management of Aneurysmal Subarachnoid Hemorrhage A Guideline for Healthcare Professionals from the American Heart Association/American Stroke Association", was published in Stroke by Connolly et al[13] in 2012. Additionally, the articles "The National Neurosurgery Quality and Outcomes Database (N2QOD): general overview and pilot-year project description"[14] and

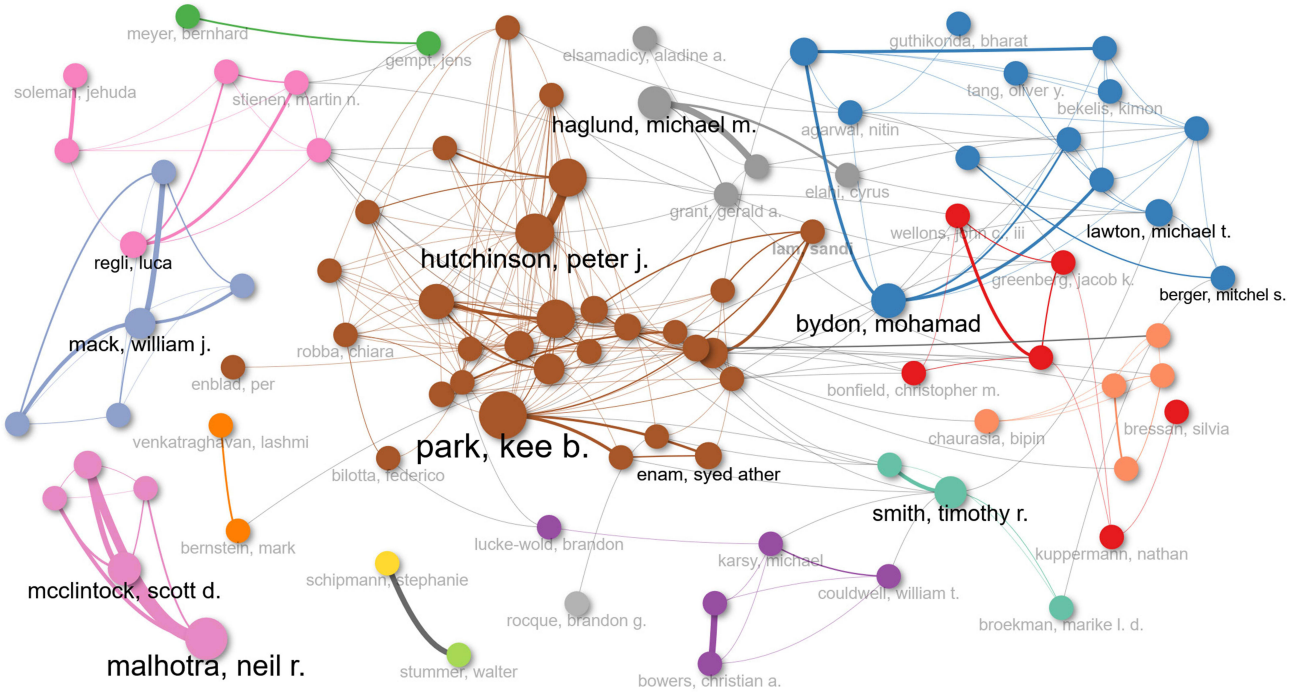

Figure 4 Author collaborative network analysis based on CiteSpace.

"Guidelines for the Management of Spontaneous Intracerebral Hemorrhage A Guideline for Healthcare Professionals from the American Heart Association/American Stroke Association"[15] ranked the second and third.

In the realm of research topics within this field, the five predominant clusters identified were: "traumatic brain injury" (Cluster #0), "30-day readmission rate" (Cluster #1), "neurosurgical practice" (Cluster #2), "neurocritical care" (Cluster #3), and "enhanced recovery" (Cluster #4). Figure 6B provided a visual representation of the temporal scientific significance of co-cited references, which was generated by charting the progression of the nine largest clusters along a timeline. The most contemporary clusters identified include "traumatic brain injury" (Cluster #0), "30-day readmission" (Cluster #1), "covid-19 pandemic" (Cluster #2), "healthcare-associated ventriculitis" (Cluster #3), "global neurosurgery" (Cluster #4), "machine learning" (Cluster #5) and "enhanced recovery" (Cluster #6).

Table 4 Ranking of Top-10 Most Productive Journals

Rank	Journal	Article Counts	Journal Citation Reports (2023)	Journal Impact Factor (2023)	Total Number of Citations	H_index
1	World Neurosurgery	599	Q3	1.9	7555	2.49
2	Journal of Neurosurgery	217	Q1	3.5	4446	5.48
3	Cureus Journal of Medical Science	179	Q3	1	362	5.66
4	Neurosurgery	144	Q1	3.9	3164	2.25
5	Neurosurgical Focus	127	Q2	3.3	1936	2.89
6	Journal of Neurosurgery-Pediatrics	117	Q3	2.1	1455	4.00
7	Acta Neurochirurgica	115	Q3	1.9	1419	1.15
8	BMJ Open	90	Q1	2.4	859	1.63
9	Childs Nervous System	87	Q3	1.3	701	2.83
10	Clinical Neurology and Neurosurgery	83	Q3	1.8	787	4.59

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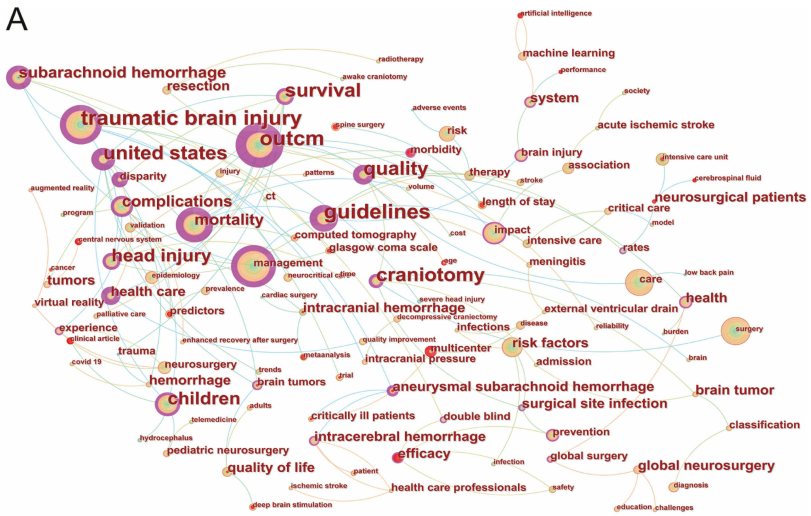

Keywords	Year	Strength	Begin	End	2014 - 2024
clinical article	2014	24.55	2014	2018	
scale	2014	11.49	2014	2015	
critically ill patients	2014	10.23	2014	2015	
infections	2014	6.59	2014	2015	
cerebrospinal fluid	2014	3.58	2014	2016	
neurosurgical patients	2015	19.53	2015	2017	
unit	2015	14.18	2015	2016	
metaanalysis	2016	16.92	2016	2018	
trauma	2016	15.23	2016	2017	
acute ischemic stroke	2015	2.71	2017	2018	
surveillance	2018	13.48	2018	2019	
awake craniotomy	2018	6.2	2018	2020	
anesthesia	2019	11.83	2019	2020	
morbidity	2016	14.2	2020	2021	
ct	2020	5.77	2020	2021	
covid 19	2021	13.8	2021	2022	
patient satisfaction	2021	10.66	2021	2022	
perioperative care	2021	10.66	2021	2022	
radiotherapy	2021	6.08	2021	2024	
patterns	2022	11.3	2022	2024	
external ventricular drain	2022	10.17	2022	2024	
central nervous system	2020	7.04	2022	2024	

Figure 5 Analysis for Keywords associated with global research on neurosurgical nursing. (**A**) Co-occurrence analysis of keywords with a threshold over 20. (**B**) Cluster analysis of keywords. (**C**) Top 22 keywords with the strongest citation bursts related to neurosurgical nursing.

Table 5 Top-10 Most Co-Cited References List

Rank	Year	First Author	Title	Source	Citations
1	2019	Dewan MC	Global neurosurgery: the current capacity and deficit in the provision of essential neurosurgical care. Executive summary of the global neurosurgery initiative at the program in global surgery and social change	Journal of Neurosurgery	78
2	2020	Jean WC	The impact of covid-19 on neurosurgeons and the strategy for triaging non-emergent operations: a global neurosurgery study	Acta Neurochirurgica	60
3	2017	Tunkel AR	2017 infectious diseases society of america's clinical practice guidelines for healthcare-associated ventriculitis and meningitis	Clinical Infectious Diseases	58
4	2014	Rolston JD	Frequency and predictors of complications in neurological surgery: national trends from 2006 to 2011	Journal of Neurosurgery	46
5	2016	Fried HI	The insertion and management of external ventricular drains: an evidence-based consensus statement	Neurocritical Care	42
6	2015	Moghavem N	Cranial neurosurgical 30-day readmissions by clinical indication	Journal of Neurosurgery	37
7	2014	Marcus LP	Incidence and predictors of 30-day readmission for patients discharged home after craniotomy for malignant supratentorial tumors in california (1995–2010)	Journal of Neurosurgery	36
8	2018	Punchak M	Neurosurgical care: availability and access in low-income and middle-income countries	World Neurosurgery	36
9	2016	Kahn EN	Neurosurgery and telemedicine in the united states: assessment of the risks and opportunities	World Neurosurgery	32
10	2020	Blue R	Telemedicine in the era of coronavirus disease 2019 (covid-19): a neurosurgical perspective	World Neurosurgery	29

Discussion

The role of neurosurgical nursing had emerged as a critical component in enhancing patient outcomes and facilitating rehabilitation. This importance had become increasingly pronounced in recent years, driven by advancements in medical technologies and the evolution of nursing philosophies. Particularly over the last decade, considerable research efforts have been directed toward the development of innovative and improved methodologies aimed at alleviating patient suffering and minimizing rates of postoperative recurrence. Utilizing bibliometric analysis allowed for a comprehensive understanding of the current research landscape within this discipline and aids in forecasting future developments. To our knowledge, this study represented the inaugural effort to investigate the focal points in the domain of neurosurgical nursing through bibliometric and visual analysis.

The bibliometric analysis of 5677 publications from 2014 to 2024 reveals a rapidly evolving field of neurosurgical nursing, marked by a 12.29% annual growth rate in research output. This surge reflects the increasing recognition of neurosurgical nursing's critical role in patient outcomes, rehabilitation, and perioperative care. The dominance of high-income countries—particularly the United States, which accounted for 39.9% of publications—highlights disparities in global research capacity. The USA's high betweenness centrality (17.35) further underscores its pivotal role as a collaborative hub, facilitating knowledge exchange across institutions and nations. However, the underrepresentation of low- and middle-income countries (LMICs) in publication output and collaboration networks signals a need for targeted capacity-building initiatives to promote equitable participation in neurosurgical nursing research.

A

References	Year	Strength	Begin	End	2014 - 2024
Connolly ES, 2012, STROKE, V43, P1711, DOI 10.1161/STR.0b013e3182587839, DOI	2012	**23.14**	2015	2017	
McGirt MJ, 2013, NEUROSURG FOCUS, V34, P0, DOI 10.3171/2012.10.FOCUS12297, DOI	2013	**20.74**	2014	2017	
Hemphill JC, 2015, STROKE, V46, P2032, DOI 10.1161/STR.0000000000000069, DOI	2015	**20.1**	2016	2019	
Rolston JD, 2014, J NEUROSURG, V120, P736, DOI 10.3171/2013.10.JNS122419, DOI	2014	**18.86**	2015	2017	
Diringer MN, 2011, NEUROCRIT CARE, V15, P211, DOI 10.1007/s12028-011-9605-9, DOI	2011	**16.66**	2014	2016	
Buchanan CC, 2014, J NEUROSURG, V121, P170, DOI 10.3171/2014.4.JNS13944, DOI	2014	**11.74**	2016	2018	
Jauch EC, 2013, STROKE, V44, P870, DOI 10.1161/STR.0b013e318284056a, DOI	2013	**11.45**	2015	2017	
Bratzler Dale W, 2013, AM J HEALTH SYST PHARM, V70, P195, DOI 10.1089/sur.2013.9999, DOI	2013	**11.45**	2015	2017	
Shah MN, 2013, J NEUROSURG, V119, P1043, DOI 10.3171/2013.3.JNS121769, DOI	2013	**11.13**	2014	2017	
Cooper DJ, 2011, NEW ENGL J MED, V364, P1493, DOI 10.1056/NEJMoa1102077, DOI	2011	**11.06**	2014	2016	
Asher AL, 2014, SPINE, V39, PS106, DOI 10.1097/BRS.0000000000000579, DOI	2014	**10.4**	2015	2017	
Asher AL, 2013, NEUROSURG FOCUS, V34, P0, DOI 10.3171/2012.10.FOCUS12311, DOI	2013	**10.4**	2015	2017	
Anderson CS, 2013, NEW ENGL J MED, V368, P2355, DOI 10.1056/NEJMoa1214609, DOI	2013	**9.4**	2014	2017	
Mendelow AD, 2013, LANCET, V382, P397, DOI 10.1016/S0140-6736(13)60986-1, DOI	2013	**7.89**	2014	2016	
Dickinson H, 2015, J NEUROSURG, V122, P61, DOI 10.3171/2014.8.JNS1498, DOI	2015	**6.52**	2018	2020	
Meara JG, 2015, LANCET, V386, P569, DOI 10.1016/S0140-6736(15)60160-X, DOI	2015	**6.52**	2018	2020	

B

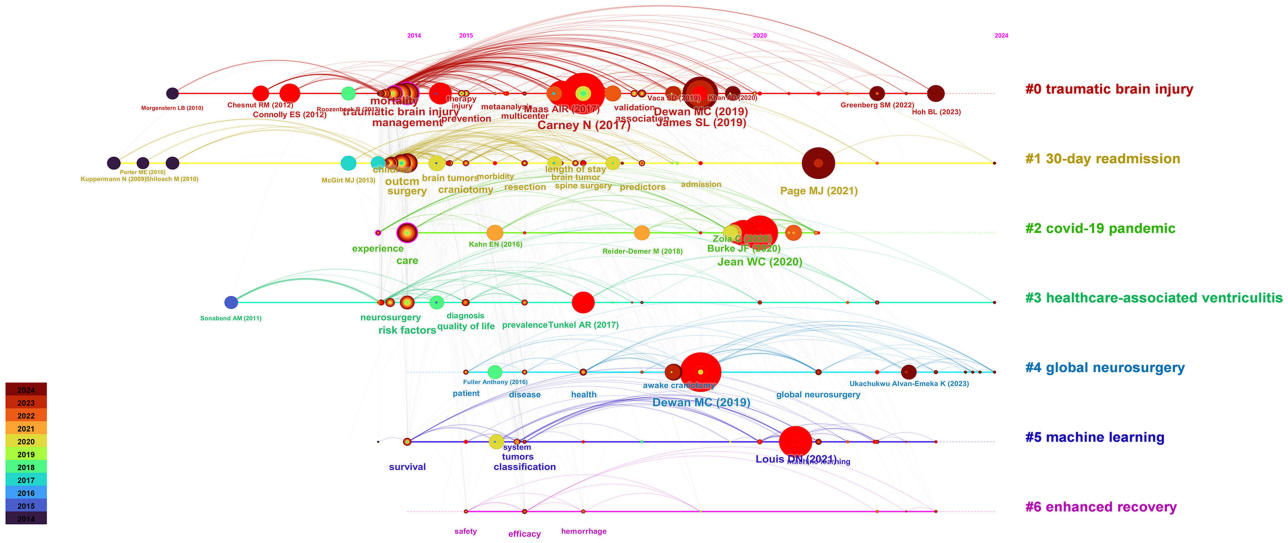

Figure 6 Citation Dynamics in Neurosurgical Nursing: Burst Detection and Co-Citation Network Evolution. (**A**) Top 16 references with the strongest citation bursts related to neurosurgical nursing field. (**B**) Timeline visualization map of the co-cited references.

Institutional productivity was concentrated in elite academic centers, with Harvard University (514 publications) and the University of California System (500) leading. The strong collaborative ties among top institutions (eg, Harvard Medical School, University of Toronto) suggest that interdisciplinary networks drive innovation. Yet the geographic clustering of productivity in North America and Europe raises questions about barriers to inclusion for researchers in other regions. Author analysis identified key contributors such as Hutchinson[16] (University of Cambridge) and Park[17] (Harvard Medical School), whose works form the backbone of citation networks. The close intra-cluster collaborations (eg, Kolias AG and Marcus HJ)[18–24] and inter-cluster linkages illustrate the field's interconnectedness, though reliance on a few prolific authors may indicate intellectual silos.

Journal analysis revealed *World Neurosurgery* as the most influential outlet (599 publications, 7563 co-citations), though 60% of top journals were Q3, with impact factors <4.0. This suggests the field may benefit from higher-impact dissemination platforms. Keyword co-occurrence and burst detection identified trending topics: "traumatic brain injury" (TBI), "COVID-19", and "artificial intelligence" (AI) emerged as sustained research fronts, while "meta-analysis" (burst strength 16.92) and "telehealth" reflect methodological and technological shifts. The prominence of "global neurosurgery" and "machine learning" in recent clusters (#4–#6) signals a pivot toward data-driven and equity-focused research.

Reference burst analysis highlighted seminal guidelines and large-scale databases as foundational to clinical practice. The timeline visualization (Figure 6B) traces the field's evolution from acute care (eg, TBI, Cluster #0) to emerging priorities like "30-day readmission" and "enhanced recovery", with "COVID-19 pandemic" (Cluster #2) illustrating rapid responsiveness to global health crises.

Limitations

This study was subject to several constraints inherent to bibliometric analyses. Firstly, the literature was exclusively sourced from the Web of Science Core Collection (WoSCC) database, which may have resulted in incomplete data and potential biases in the studies selected. Secondly, only articles and reviews published in English were included, which may restrict the comprehensiveness of our findings. Lastly, despite following standardized methodologies, certain biases cannot be entirely avoided, as variations in keyword phrasing, identical author names, and the continuously updated nature of the WoSCC database may introduce inconsistencies. We believed that these limitations warrant consideration in future research endeavors. Nonetheless, it can be asserted that our study accurately reflected the current state and emerging trends within this field.

Conclusion

This study provides the first bibliometric analysis of global research trends in neurosurgical nursing from 2014 to 2024, addressing a significant gap in the literature. By systematically mapping publication patterns, collaboration networks, and emerging research fronts, we offer an evidence-based perspective on the field's development. These results may help researchers identify productive collaborations, funding agencies prioritize support areas, and journals understand publishing trends.

Abbreviations

WOSCC, Web of Science Core Collection; LMICs, low- and middle-income countries; TBI, traumatic brain injury; AI, artificial intelligence; IF, impact factor; Q3, the third quartile; N2QOD, Neurosurgery Quality and Outcomes Database.

Data Sharing Statement

All raw data and code are available from the corresponding author (Xiang-Kong Song, Email: qhsxk@163.com) upon reasonable request.

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Disclosure

The authors report no conflicts of interest in this work.

References

1. Paul Golidtum J, Custodio JE, Estanislao J, et al. LINC-18. Challenges in the neurosurgical care of pediatric patients with central nervous system tumors during the COVID-19 pandemic. *Neuro Oncol*. 2022;24(Suppl 1):i166. doi:10.1093/neuonc/noac079.617
2. Okon II, Akilimali A, Furqan M, et al. Barriers to accessing neurosurgical care in low- and middle-income countries from Africa: editorial. *Ann Med Surg*. 2024;86(3):1247–1248. doi:10.1097/MS9.0000000000001758
3. McLean E, Cornwell MA, Bender HA, et al. Innovations in neuropsychology: future applications in neurosurgical patient care. *World Neurosurg*. 2023;170:286–295. doi:10.1016/j.wneu.2022.09.103

4. Dewan MC, Rattani A, Fieggen G, et al. Global neurosurgery: the current capacity and deficit in the provision of essential neurosurgical care. Executive summary of the global neurosurgery initiative at the program in global surgery and social change. *J Neurosurg*. 2019;130(4):1055–1064. doi:10.3171/2017.11.JNS171500
5. Jean WC, Ironside NT, Sack KD, Felbaum DR, Syed HR. The impact of COVID-19 on neurosurgeons and the strategy for triaging non-emergent operations: a global neurosurgery study. *Acta Neurochirurgica*. 2020;162(6):1229–1240. doi:10.1007/s00701-020-04342-5
6. Tunkel AR, Hasbun R, Bhimraj A, et al. 2017 Infectious diseases society of america's clinical practice guidelines for healthcare-associated ventriculitis and meningitis. *Clinl Infect Dis*. 2017;64(6):E34–E65. doi:10.1093/cid/ciw861
7. Okon II, Musharaf I, Bankole NDA, et al. Neurosurgical challenges of open access publishing in LMICs. *Ann Med Surg*. 2024;86(6):3199–3200. doi:10.1097/MS9.0000000000002110
8. Ikezaki K, Fukui M. Origin and evolution of the Department of Neurosurgery, Neurological Institute, Faculty of Medicine, Kyushu University. *Neurosurgery*. 2000;46(2):471–477; Discussion 478. doi:10.1097/00006123-200002000-00039
9. Pearn J. Looking both ways: the Jamieson Memorial Lecture, 2006. *ANZ J Surg*. 2007;77(6):410–417. doi:10.1111/j.1445-2197.2007.04084.x
10. Kirkland-Kyhn H, Teleten O, Wilson M. A retrospective, descriptive, comparative study to identify patient variables that contribute to the development of deep tissue injury among patients in intensive care units. *Ostomy/Wound Manage*. 2017;63(2):42–47.
11. Lv H, Wang Y, Gao Z, et al. Knowledge mapping of the links between the microbiota and allergic diseases: a bibliometric analysis (2002–2021). *Front Immunol*. 2022;13:1045795. doi:10.3389/fimmu.2022.1045795
12. Tunkel AR, Hasbun R, Bhimraj A, et al. 2017 Infectious diseases society of America's clinical practice guidelines for healthcare-associated ventriculitis and meningitis. *Clinl Infect Dis*. 2017;64(6):701–706. doi:10.1093/cid/cix152
13. Connolly ES, Rabinstein AA, Carhuapoma JR, et al. Guidelines for the management of aneurysmal subarachnoid hemorrhage a guideline for healthcare professionals from the American Heart Association/American Stroke Association. *Stroke*. 2012;43(6):1711–1737. doi:10.1161/STR.0b013e3182587839
14. McGirt MJ, Speroff T, Dittus RS, Harrell FE, Asher AL. The National Neurosurgery Quality and Outcomes Database (N2QOD): general overview and pilot-year project description. *Neurosurg Focus*. 2013;34(1):E6. doi:10.3171/2012.10.FOCUS12297
15. Hemphill JC, Greenberg SM, Anderson CS, et al. Guidelines for the management of spontaneous intracerebral hemorrhage a guideline for healthcare professionals from the American Heart Association/American Stroke Association. *Stroke*. 2015;46(7):2032–2060. doi:10.1161/STR.0000000000000069
16. Hutchinson PJ, Kolias AG, Tajsic T, Adeleye A, Servadei F. Consensus statement from the international consensus meeting on the role of decompressive craniectomy in the management of traumatic brain injury. *Acta Neurochirurgica*. 2019;161(7):1261–1274. doi:10.1007/s00701-019-03936-y
17. Park KB, Johnson WD, Dempsey RJ. Global Neurosurgery: the Unmet Need. *World Neurosurg*. 2016;88:32–35. doi:10.1016/j.wneu.2015.12.048
18. Bandyopadhyay S, Khan DZ, Marcus HJ, et al. CSF Rhinorrhea after endonasal intervention to the skull base (CRANIAL)? Part 2: impact of COVID-19. *World Neurosurg*. 2021;149:E1090–E1097. doi:10.1016/j.wneu.2020.12.169
19. Brennan PM, Kolias AG, Joannides AJ, et al. The management and outcome for patients with chronic subdural hematoma: a prospective, multicenter, observational cohort study in the United Kingdom. *J Neurosurg*. 2017;127(4):732–739. doi:10.3171/2016.8.JNS16134
20. Coulter IC, Kolias AG, Marcus HJ, et al. Proposal for a prospective multi-centre audit of chronic subdural haematoma management in the United Kingdom and Ireland. *Br J Neurosurg*. 2014;28(2):199–203. doi:10.3109/02688697.2013.835378
21. Edlmann E, Thelin EP, Caldwell K, et al. Dex-CSDH randomised, placebo-controlled trial of dexamethasone for chronic subdural haematoma: report of the internal pilot phase. *Sci Rep*. 2019;9. doi:10.1038/s41598-019-42087-z
22. Horsfall HL, Lawrence A, Venkatesh A, et al. Reported outcomes in transsphenoidal surgery for pituitary adenomas: a systematic review. *Pituitary*. 2023;26(2):171–181. doi:10.1007/s11102-023-01303-w
23. Hutchinson PJ, Edlmann E, Hanrahan JG, et al. A randomised, double blind, placebo-controlled trial of a two-week course of dexamethasone for adult patients with a symptomatic Chronic Subdural Haematoma (Dex-CSDH trial). *Health Technol Assess*. 2024;28(12):1–122. doi:10.3310/XWZN4832
24. Poon MTC, Piper RJ, Thango N, et al. Variation in postoperative outcomes of patients with intracranial tumors: insights from a prospective international cohort study during the COVID-19 pandemic. *Neuro-Oncology*. 2023;25(7):1299–1309. doi:10.1093/neuonc/noad019

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