

Analysis of Hotspots and Frontiers in Nursing Research for Cancer Clinical Trials Based on Web of Science: A Bibliometric Study

Lihui Li, Xiaoman Zeng, Mengfei Xie, Qianwen Liu*

Sun Yat-sen University Cancer Center, Guangzhou, China

*Corresponding author: Qianwen Liu (liuqianw@sysucc.org.cn)

Abstract

Background: Oncology clinical trial nursing sits at the intersection of clinical trial protocols and patient care, and it has a direct impact on both trial quality and patient safety. However, the overall research trends in this field have not been clearly mapped. To address this gap, we used bibliometric methods to systematically examine the knowledge structure and development of oncology clinical trial nursing. **Methods:** We searched the Web of Science Core Collection (WOSCC) for publications on oncology clinical trial nursing from January 1, 1999, to September 30, 2025. We then analyzed the retrieved records using Microsoft Excel, VOSviewer, CiteSpace, and RStudio, focusing on publication volume, countries, institutions, authors, journals, and keywords. **Results:** A total of 1,510 papers were included in the final analysis. Annual publication output showed a fluctuating but overall upward trend. Among countries, the United States was the most productive, contributing 688 papers, and also had the strongest collaboration network (total link strength [TLS] = 145). At the institutional level, Harvard University led in publication volume (240 papers) and maintained the closest inter-institutional collaborations (TLS=93). Among authors, Miaskowski C ranked first with 20 publications, while Mitchell SA had the broadest research collaboration network (TLS=46). Journal analysis indicated that Oncology Nursing Forum (90 papers; IF=1.4) published the most articles in the field of oncology clinical trial nursing. Research hotspots primarily focused on four themes: clinical treatment, doctor-patient communication, supportive care, and symptom management. Recent emerging keywords included survivors, pain, interventions, nursing care, anxiety, feasibility, and education. **Conclusion:** Research output in oncology clinical trial nursing is likely to continue rising, but stronger collaboration across countries, institutions, and authors is still needed. Future work is expected to center on symptom management, palliative care, and psychosocial support.

Keywords

Oncology; Clinical trial; Nursing; Bibliometrics; Hotspots; Frontiers.

1. INTRODUCTION

Cancer continues to be a leading cause of death and disability worldwide, placing a heavy and lasting burden on public health systems and socioeconomic development [1]. Clinical trials of new drugs and therapies are essential for advancing cancer diagnosis and treatment; they help establish the balance between efficacy and risk through rigorous evidence-based evaluation and inform both clinical practice and policy decisions [2]. However, the quality and feasibility of a trial depend not only on its design and interventions but also on the expertise and

operational management skills of the team carrying it out [3]. Within this multidisciplinary effort, clinical trial nurses occupy a distinct position that combines clinical and humanistic care. Their responsibilities range from participant recruitment and informed consent to health education, intervention delivery, safety monitoring, and data collection, and the quality of their work directly affects ethical compliance, data integrity, and participant safety [4,5].

As precision medicine, immunotherapy, and personalized treatment continue to advance, cancer clinical trials have become more complex in both design and implementation—for example, through composite endpoints, stratified designs, adaptive designs, and decentralized research models. These developments have placed broader and more specialized demands on trial nurses, such as early recognition and management of adverse events, systematic collection of patient-reported outcomes, and delivery of remote follow-up and interventions [6,7]. Nursing has proven really valuable. It helps improve the participant experience. It boosts compliance and cuts down on dropouts. It also leads to better data quality. So nursing isn't just there to carry out the trial protocol. It can actually be a key driver for making trials more feasible and ethical [8,9].

Nursing is playing a bigger role in cancer clinical trials. But most of the existing research is all over the place. It comes from different fields, or just one center, or it's based on people's personal experience. There aren't many systematic, numbers-based overviews. We don't really have a clear picture of the whole knowledge structure, how things have changed over time, or what the current hot topics are. That makes it hard for the field to agree on common standards. It also makes it tough to compare results across different studies [10].

Bibliometrics uses large-scale publication data. It's a quantitative method. It lets us explore a field's knowledge structure, its research frontiers, and how things have changed over time. We look at different indicators. For instance, publication counts, citation patterns, collaboration networks, and keyword trends. This approach gives us some solid, evidence-based insights. We can use these insights for research management. Or for disciplinary development. And for setting research priorities [11,12,13,14]. Bibliometric analysis looks at research trends over long time periods and large amounts of data. It's really good at spotting new research topics, finding key researchers, and showing how different countries work together. This gives schools and policymakers a solid evidence base to help with their decisions [15].

Consequently, this study took a quantitative approach to systematically analyse the literature on nursing involvement in cancer clinical trials from 1999 to 2025, utilising data extracted from the Web of Science Core Collection (WOSCC). The primary objectives were to: (1) describe temporal development, characteristics, and output trends in the field; (2) visualise and analyse academic influence and collaboration networks at national, institutional, and author levels; (3) identify and interpret core research themes and keyword clusters; and (4) detect emerging research hotspots and future research frontiers, providing evidence-based support for discipline construction, education, training, and practice improvement in nursing for cancer clinical trials.

2. METHODS

2.1. Data Source

We got the data from WOSCC. It's a well-known research database. They pick journals carefully. They track citations in a thorough way. They also update the records all the time. A lot of people trust it for bibliometric work. It gives us a solid base for our study [16].

2.2. Search Strategy

Relevant literature published between January 1, 1999, and September 30, 2025, was retrieved from the WOSCC database. The search strategy was: TS=(neoplasm* OR cancer* OR tumor* OR tumour* OR oncology OR malignan* OR "solid tumor" OR "solid tumour") AND TS=("clinical trial*") AND TS=(nurs* OR nurse* OR "nursing care" OR "nursing intervention*"). The inclusion criteria were literature types of "Article" and "Review"; non-research literature such as meeting abstract, proceeding paper, early access, editorial material, letter, news item, retracted publication, correction, meeting, reprint, etc. were excluded. There were no language restrictions in the search. To ensure data consistency and avoid bias caused by daily updates in WOSCC, all searches and data exports were completed on October 15, 2025 (Figure 1).

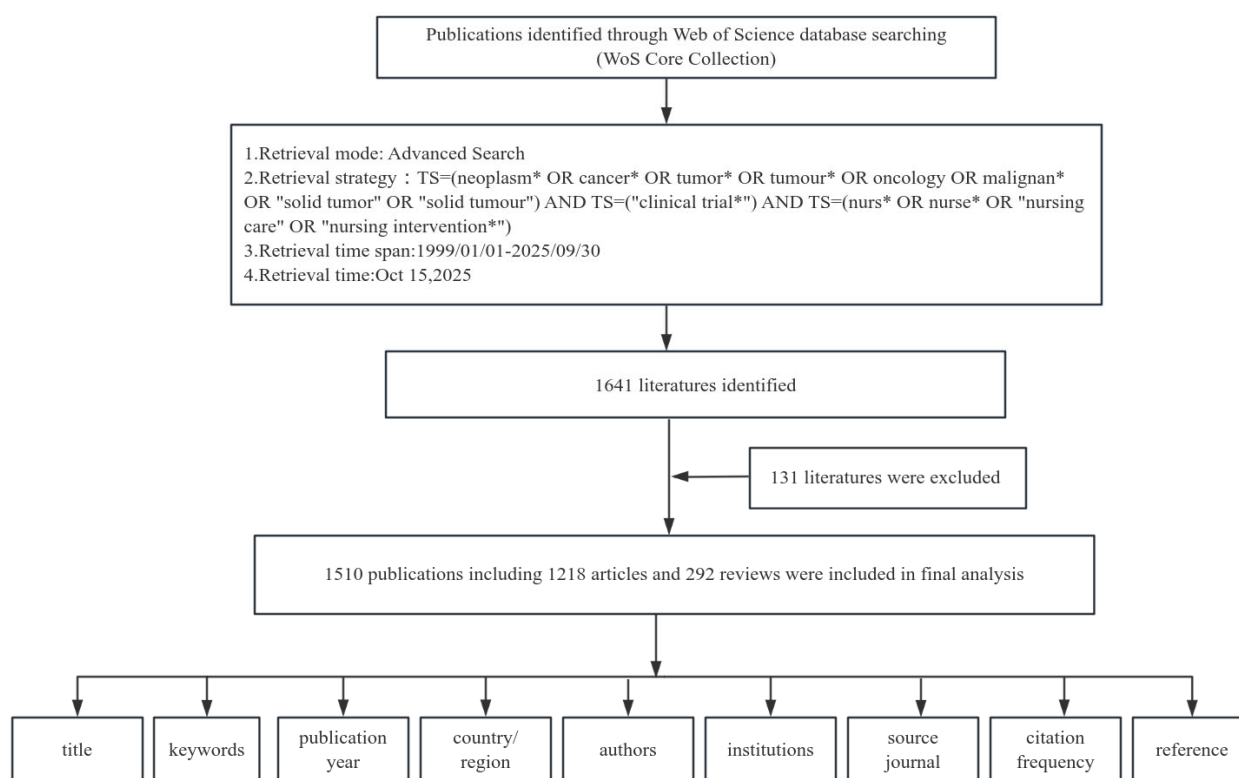


Figure 1. Data Retrieval Flowchart

Note: WoS Core Collection, Web of Science Core Collection.

2.3. Data Downloading and Collection

Export the complete records of the included literature and their cited references in TXT format as the data foundation for subsequent bibliometric analysis. The exported content includes core information such as title, keywords, publication year, country/region, authors, institutions, source journal, citation frequency, and reference list. Additionally, to ensure the comprehensiveness and hierarchical nature of the analysis, we further obtained the Journal Citation Reports(JCR) quartile information of the journals and the World Bank country classification (grouping based on income levels) for comparative analysis of national-level research output and evaluation of journal impact. This was supplemented by the consolidation of country data (e.g., merging entries for the UK) and the merging of keywords with identical or highly similar semantics.

2.4. Data Analysis

For the 1,510 included studies, bibliometric analysis was carried out using Microsoft Excel, VOSviewer, CiteSpace, and RStudio. Excel was first used to summarize annual publication trends, and a polynomial regression model was applied to predict future publication volume, offering a preliminary view of potential research directions. Next, VOSviewer was used to construct collaboration networks among countries, authors, and institutions, as well as to perform keyword co-occurrence, document co-citation, and bibliographic coupling analyses. Finally, CiteSpace was employed for keyword burst detection to identify research frontiers and hotspots across different time periods.

VOSviewer is a visualization and analysis software widely used in bibliometric research. It can construct and display various types of scientific knowledge maps, including collaboration networks among countries, authors, and institutions, as well as co-citation and keyword co-occurrence networks [17]. In visual maps generated by VOSviewer, nodes typically represent different units of analysis, such as countries, journals, or keywords, and their size is proportional to the number of publications, citation frequency, or keyword occurrence frequency; Total Link Strength (TLS) is used to quantify the overall degree of association between nodes. The thickness of the lines reflects the strength of the connections between nodes; thicker lines indicate a stronger association. Different colors represent different clusters; nodes of the same color belong to the same thematic group, indicating a higher degree of correlation among them.

CiteSpace is a piece of software. Professor Chaomei Chen developed it. It's used for mapping scientific knowledge. Many researchers use it to find out the key topics, hot issues, and how research trends change over time [18]. This tool combines visualization, data mining, and scientometrics. It helps researchers see how different fields evolve [19]. In keyword burst analysis, the blue lines on the map show the timeline. The red parts mark the burst periods. They show the start year, end year, and how long the burst lasted. That makes it easy to spot topics that suddenly got a lot more attention during a certain period.

3. RESULTS

3.1. General Information

We had 1510 publications in this study. 1218 were articles, that's 80.66%. 292 were reviews, 19.34%. Almost all were in English - 1487 papers, 98.48%. For open access, 791 publications were OA, which is 52.38%.

3.2. Annual Publication Volume

Between 1999 and 2025, the annual number of publications in this field exhibited a fluctuating upward trend, with an average annual growth rate of 27.24%. To more intuitively illustrate the changes in publication volume over time, this study employed a cubic trendline model for fitting. The model's R^2 value was 0.9233, indicating a high degree of fit and the ability to accurately depict the long-term growth trajectory. Based on changes in annual publication volume and trend slope, the development of this field can be divided into three phases: (1) Initial Emergence Phase (1999-2002): The average annual publication volume was approximately 10 papers, with a total of 42 papers published, accounting for 2.78% of the total literature; research activities were relatively scattered; (2) Slow Growth Phase (2003-2015): A total of 483 papers were published, accounting for 31.99% of the total. During this phase, the number of published papers showed a gradual and stable growth trend, and attention to this field gradually expanded; (3) Rapid Growth Phase (2016-2025): A total of 985 papers were published, accounting for 65.23% of the total, demonstrating a significant acceleration trend.

Since 2020, annual publication counts have exceeded 100 papers for the first time and remained at a high level, reflecting sustained research interest and the rapidly growing influence of the field (Figure 2).

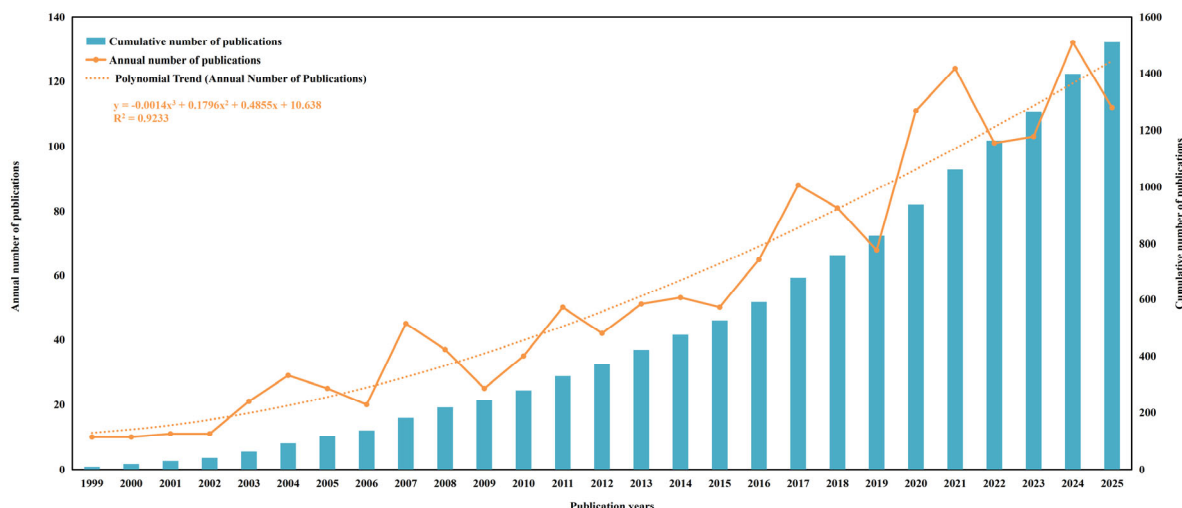


Figure 2. Temporal Trends in Oncology Clinical Trial Nursing Research
(Analysis of publications from January 1999 to September 2025)

3.3. Country

In the field of oncology clinical trial nursing research, among the top 10 countries/regions in terms of publication volume, the USA ranks first with an absolute advantage of 688 articles (45.56%), followed by the UK (215 papers, 14.24%) and China (158 papers, 10.46%). In terms of literature impact, the USA has the highest total citation count (15,061), followed by the UK(3,207) and the Netherlands (979). When measured by average citations per article, the Netherlands leads with 61.19, indicating its prominent research influence; the UK(42.76) and the USA(32.18) follow closely. Notably, except for China, which is classified as an upper-middle-income country, and Iran, which is a middle-income country, all other countries/regions in the top 10 are high-income countries (Table 1).

Table 1. Top 10 countries/regions in terms of publication volume in the field of oncology clinical trial nursing research

Countries/Regions	Group Name	Number	Rank	Total Citations	Average Article Citations	Rank
USA	High income	688	1	15061	32.18	1
UK	High income	215	2	3207	42.76	2
China	Upper middle income	158	3	954	12.72	4
Canada	High income	117	4	877	25.79	6
Australia	High income	93	5	926	30.87	5
Germany	High income	61	6	476	21.64	8
Italy	High income	57	7	502	17.93	7
Netherlands	High income	54	8	979	61.19	3
Iran	Middle income	53	9	296	7.59	13
Spain	High income	49	10	394	17.13	11

In terms of national collaboration networks, The USA ranks first in collaborative connections (TLS=145), followed by the UK (TLS=143) and Germany (TLS=101). Visualization analysis further reveals that the collaboration landscape in this field remains predominantly led by high-income countries, but the participation of countries such as Chile, Egypt, and Saudi Arabia has shown an increasing trend in recent years (Figure 3 and 4).

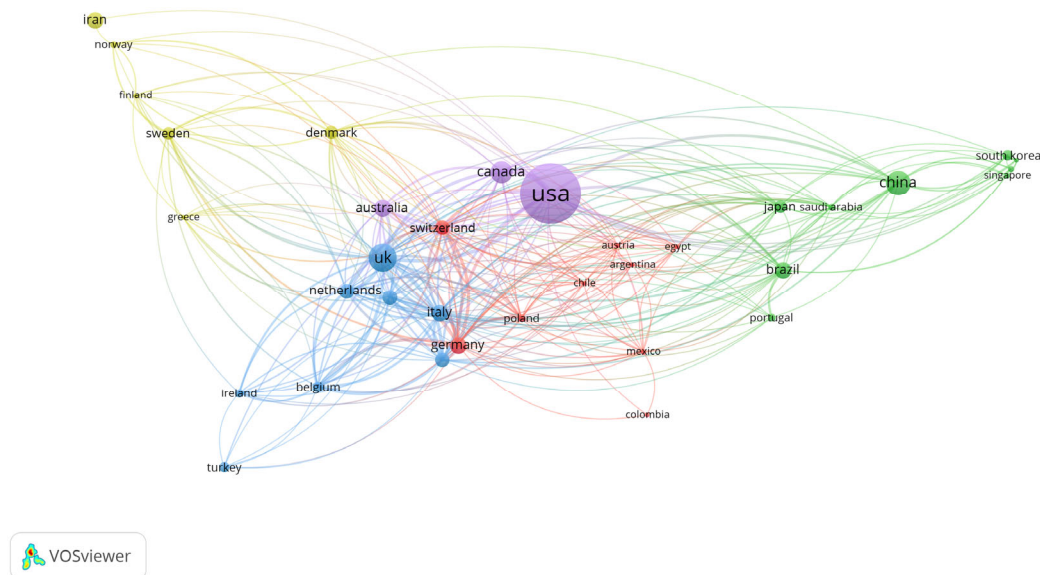


Figure 3. Collaborative Network Map of Producing Countries/Regions in the Field of Oncology Clinical Trial Nursing Research

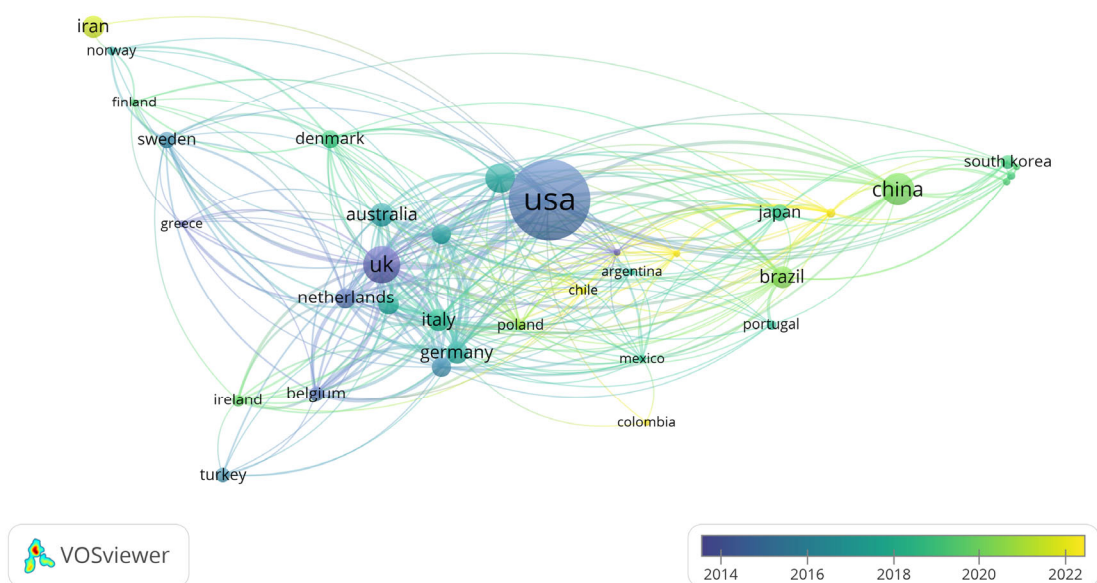


Figure 4. National Timeline View in the Field of Nursing Research for Cancer Clinical Trials

3.4. Institution

In terms of institutional publication volume, Harvard University ranked first globally with 240 papers (15.89%), followed by the University of California system (138 papers, 9.14%) and the University of North Carolina (104 papers, 6.89%). Notably, among the top 10 institutions in terms of output, 7 were from the United States (Table 2). In the analysis of institutional collaboration networks, Harvard University continued to demonstrate the strongest collaborative influence (TLS = 93), followed by the University of North Carolina (TLS = 74) and Yale University (TLS = 69). indicating a significant imbalance in global collaboration distribution (Figure 5).

Table 2. Top 10 Institutions in the Field of Nursing Research for Cancer Clinical Trials

Rank	Affiliations	Country	Record Count
1	Harvard University	USA	240
2	University of California System	USA	138
3	University of North Carolina	USA	104
4	University of London	UK	93
5	University of Toronto	Canada	92
6	University of Texas System	USA	89
7	University of Pennsylvania	USA	89
8	National Institutes of Health	USA	85
9	University System of Ohio	USA	76
10	University of Copenhagen	Denmark	66

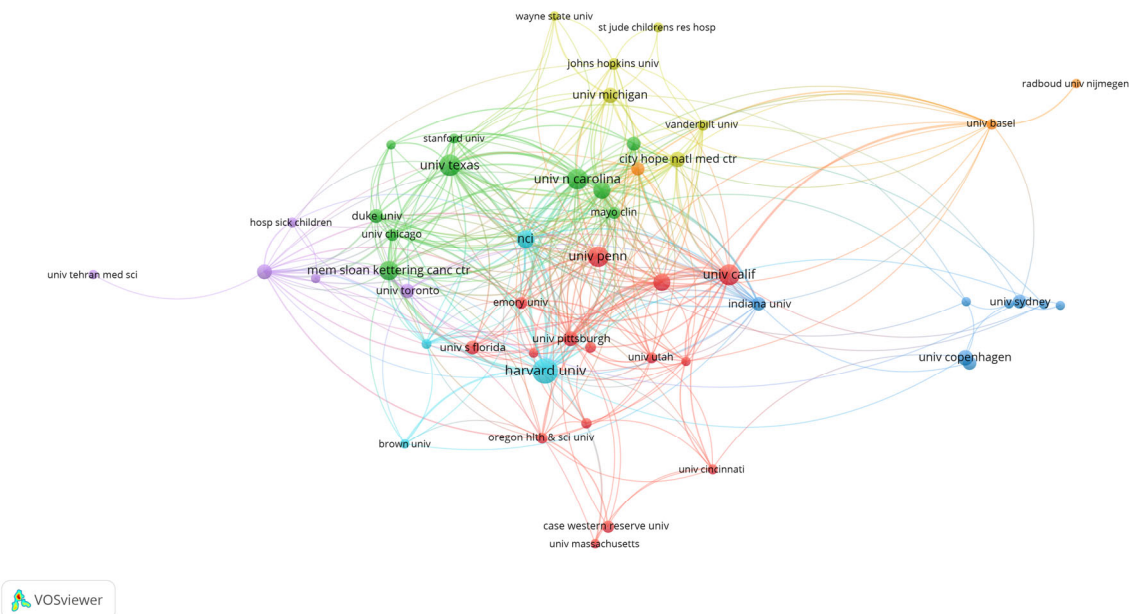


Figure 5. Collaborative Network Diagram of Institutions in the Field of Oncology Clinical Trial Nursing Research

3.5. Author

Among the top 10 authors in terms of the number of published papers, Miaskowski C has the highest number of publications ($n = 20$), followed by Mccorkle R ($n = 13$) and Mitchell SA ($n = 11$) (Table 3).

In the author collaboration network, Mitchell SA indicating a more prominent centrality in research collaboration (TLS = 46); Miaskowski C and Cooley ME are tied for second place (both with TLS = 45). Overall, although the collaborative relationships among authors exhibit a certain degree of fragmentation, four relatively stable core collaboration clusters can still be identified within the network (Figure 6).

Table 3. Top 10 Authors in the Field of Nursing Research for Cancer Clinical Trials

Rank	Authors	Record Count	% of 1,510
1	Miaskowski C	20	1.325
2	Mccorkle R	13	0.86
3	Mitchell SA	11	0.73
4	Cooley ME	9	0.60
5	Sikorskii A	9	0.60
6	Given CW	7	0.46
7	Hammer MJ	7	0.46
8	Hinds PS	7	0.46
9	Howell D	7	0.46
10	Landier W	7	0.46

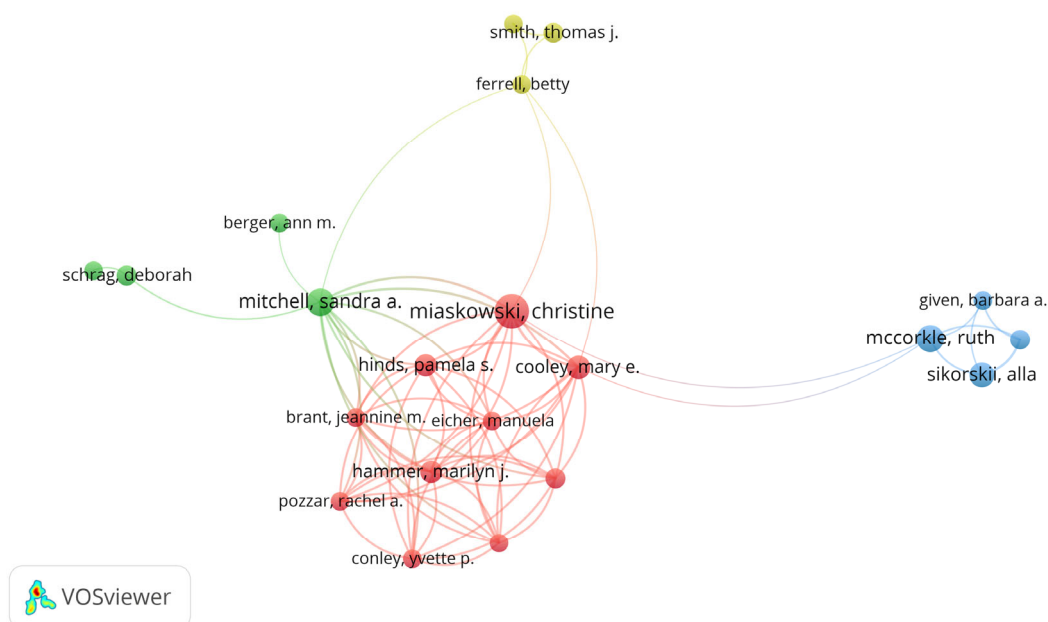


Figure 6. Collaborative Network Diagram of Authors in the Field of Oncology Clinical Trial Nursing Research

3.6. Journal

The top 10 journals in terms of publication volume collectively published 440 papers, accounting for 29.14% of the total. Among them, Oncology Nursing Forum had the highest output (n=90, 5.96%; IF=1.4), followed by Clinical Journal of Oncology Nursing (n=61, 4.04%; IF=1.2). Notably, the impact factors of 8 out of these top 10 journals are below 5, indicating that research in this field is primarily published in medium-impact journals. Geographically, these leading journals are predominantly based in the USA and UK (Table 4).

In the journal co-citation network, Journal of Clinical Oncology was co-cited 1,848 times, establishing it as a core knowledge source (TLS = 65,256). Other frequently co-cited journals include JAMA, Lancet Oncology, Supportive Care in Cancer, and Journal of Pain and Symptom Management, among others (Figure 7).

Bibliographic coupling analysis revealed that the "Oncology Nursing Forum" had the highest number of publications (n=90) and also the highest total citation count (2096 times). The "Seminars in Oncology Nursing" published 52 articles, ranking second in citation count (1837 times), with a relatively high citation rate per article. Journals such as "Supportive Care in Cancer" and "Journal of Pain and Symptom Management" formed distinct clusters, suggesting that the research frontier in this field may focus on symptom management and improving the quality of life for patients in oncology clinical trials (Figure 8).

In the citation frequency analysis, the top 10 most cited papers in the field of oncology clinical trial nursing had citation counts ranging from 247 to 833 times. Among them, the article "Ovarian Cancer: An Integrated Review" by Stewart C, published in the "Seminars in Oncology Nursing," had the highest citation count (833 times). These highly cited articles primarily addressed research topics such as the management of adverse reactions to anti-cancer drugs, informed consent, quality of life, and psychological interventions (Table 5).

Table 4. Top 10 Journals in the Field of Nursing Research for Cancer Clinical Trials

Rank	Publication Titles	Record count	JCR	IF(2025)	H-index	Country	% of 1,510
1	Oncology Nursing Forum	90	Q3/Q4	1.4	81	USA	5.96
2	Clinical Journal of Oncology Nursing	61	Q3/Q4	1.2	40	USA	4.04
3	Seminars in Oncology Nursing	52	NA	NA	41	UK	3.44
4	Cancer Nursing	43	Q1/Q2/Q3	2.5	71	USA	2.85
5	Supportive Care in Cancer	40	Q1/Q2	3	98	USA	2.65
6	Cochrane Database of Systematic Reviews	39	Q1	9.4	244	UK	2.58
7	European Journal of Oncology Nursing	31	Q1/Q2/Q3	2.7	49	USA	2.05
8	Asia-Pacific Journal of Oncology Nursing	29	Q1	2.8	NA	HONG KONG	1.92
9	BMJ Open	28	Q1/Q2	2.3	69	UK	1.85
10	Journal of Advanced Nursing	27	Q1	3.4	136	UK	1.79

Note: JCR = Journal Citation Reports; IF (2025) = Impact Factor for the year 2025.

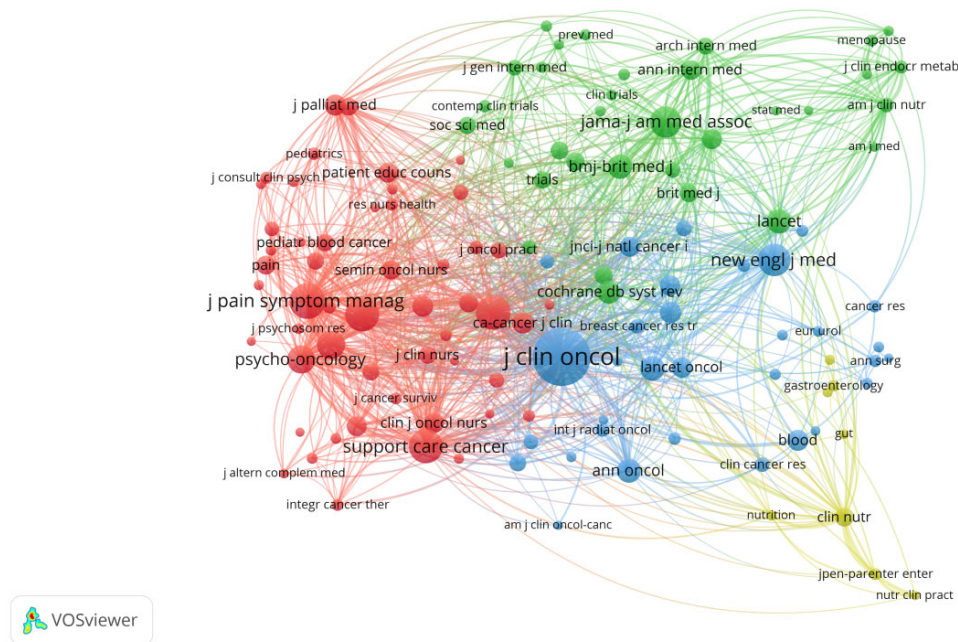


Figure 7. Co-citation Network Diagram of Journals in the Field of Oncology Clinical Trial Nursing Research

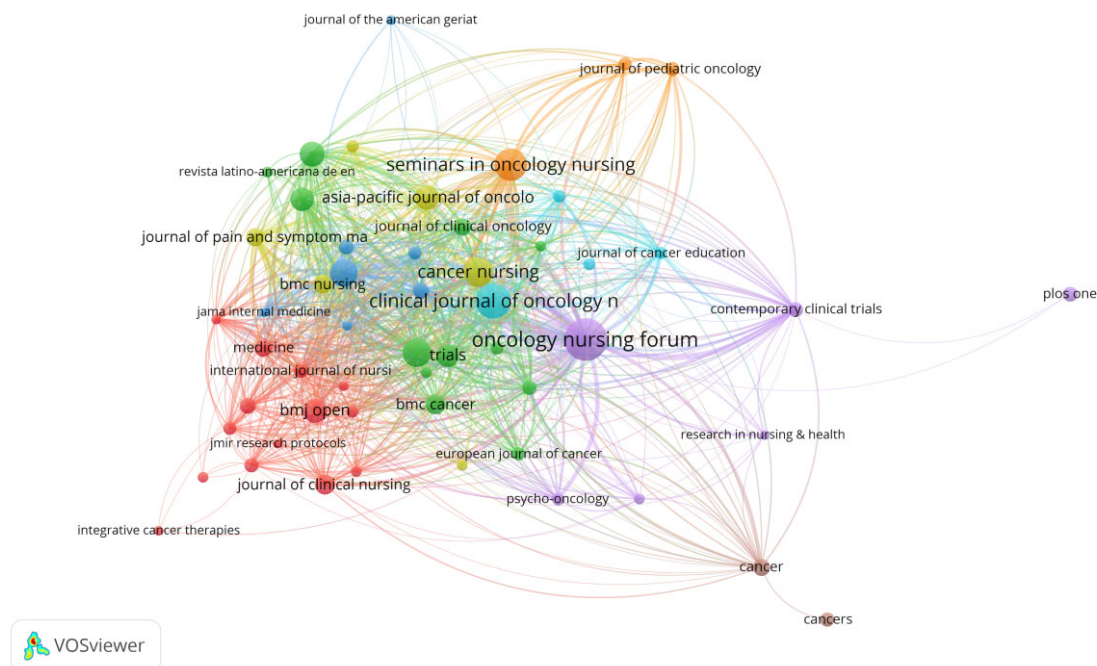


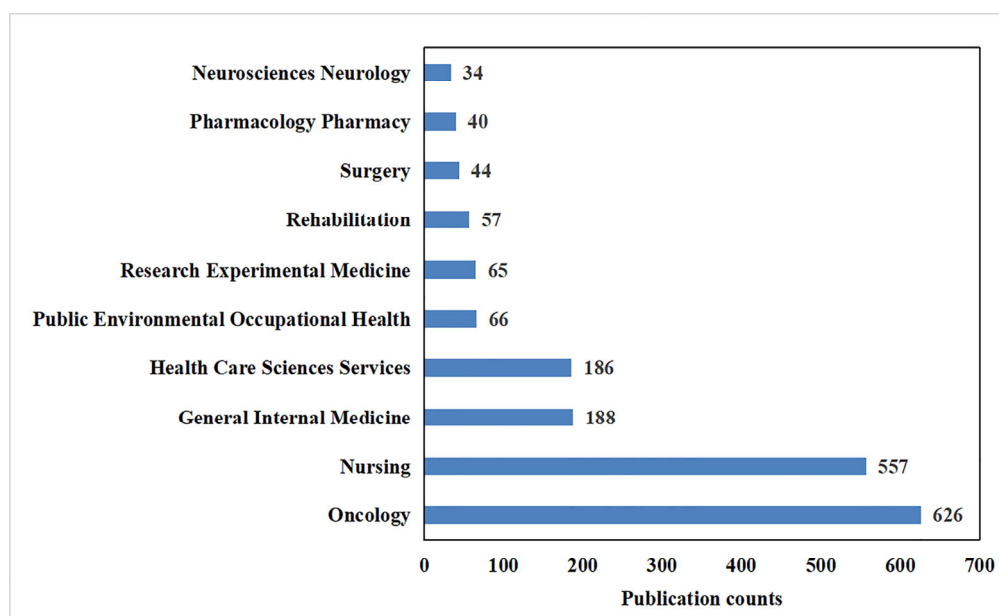
Figure 8. Literature Coupling Map in the Field of Oncology Clinical Trial Nursing Research

3.7. Research field

In terms of the distribution of papers, oncology ranked first with 626 papers, highlighting its leading role in the field of nursing research on cancer clinical trials. Nursing followed closely behind with a total of 557 papers, highlighting the important role of the nursing perspective in this field. In addition, disciplines such as general practice, internal medicine, health care services, public health and environmental health, rehabilitation medicine, surgery, pharmacology and pharmacy, and neuroscience also made contributions to varying degrees, reflecting the multi-level and interdisciplinary nature of this research field (Figure 9).

Table 5. Top 10 Highly Cited Articles in the Field of Nursing Research for Cancer Clinical Trials

Rank	Title	Year	First author	Journal	TC	TC per Year	NTC	Document Type
1	Ovarian Cancer: An Integrated Review	2019	Stewart C	Seminars in Oncology Nursing	833	119	31.84	Review
2	Quality of informed consent in cancer clinical trials: a cross-sectional survey	2001	Joffe S	Lancet	471	18.84	7.15	Article
3	Recommendations for Planning Pilot Studies in Clinical and Translational Research	2011	Moore CG	CTS-Clinical and Translational Science	468	31.20	17.52	Article
4	The development of an EORTC quality of life questionnaire to assess chemotherapy-induced peripheral neuropathy: The QLQ-CIPN20	2005	Postma TJ	European Journal of Cancer	434	20.67	7.28	Article
5	Effective communication skills are the key to good cancer care	1999	Fallowfield L	European Journal of Cancer	365	13.52	4.49	Article
6	Geriatric Assessment-Driven Intervention (GAIN) on Chemotherapy-Related Toxic Effects in Older Adults With Cancer A Randomized Clinical Trial	2021	Li D	JAMA Oncology	306	61.20	33.13	Article
7	Platinum-Induced Ototoxicity in Children: A Consensus Review on Mechanisms, Predisposition, and Protection, Including a New International Society of Pediatric Oncology Boston Ototoxicity Scale	2012	Brock PR	Journal of Clinical Oncology	298	21.29	10.90	Article
8	The evolution of cancer surgery and future perspectives	2015	Wyld L	Nature Reviews Clinical Oncology	288	26.18	11.43	Article
9	Evaluation of Interventions Intended to Increase Colorectal Cancer Screening Rates in the United States A Systematic Review and Meta-analysis	2018	Dougherty MK	JAMA Internal Medicine	252	31.50	10.41	Review
10	Psychological interventions for needle-related procedural pain and distress in children and adolescents	2018	Birnie KA	Cochrane Database of Systematic Reviews	247	30.88	10.20	Review

**Figure 9.** Top 10 Research Areas in Nursing for Cancer Clinical Trials

3.8. Keywords

We ran a cluster analysis. The papers fell into four main groups.

Group 1 is red. It's about clinical treatment. The key words are therapy, chemotherapy, and clinical trial. People are looking at anti-tumor treatments and trial methods.

Group 2 is green. It's about doctor-patient communication and decision-making. The key words are communication, decision-making, and recruitment. This shows researchers care about recruitment, consent, and communication.

Group 3 is blue. It's about supportive care. Key words are care, intervention, and needs. Clinical trial nursing is paying attention to patients' care needs.

Group 4 is yellow. It's about symptom management. Key words are quality of life, pain, and anxiety. More research is going into improving quality of life and mental health.

Timeline analysis further indicated that emerging keywords in recent years include "immunotherapy," "acupuncture," "oncology nursing," "experiences," and "anxiety," reflecting an academic shift from traditional clinical interventions towards precision treatment, complementary therapies, and patient experiences (Figure 10 and 11).

We ran a keyword burst analysis. "Randomized clinical trial" had the longest burst, from 2007 to 2016. That was in the early stage. So that topic stayed popular for a long time. More recently, "palliative care" (2019-2025) and "depression" (2019-2025) show up as new frontiers. This tells us that clinical trial nursing is now paying more attention to palliative care, mental health, and quality of life. These areas might become important trends in the future (Figure 12).

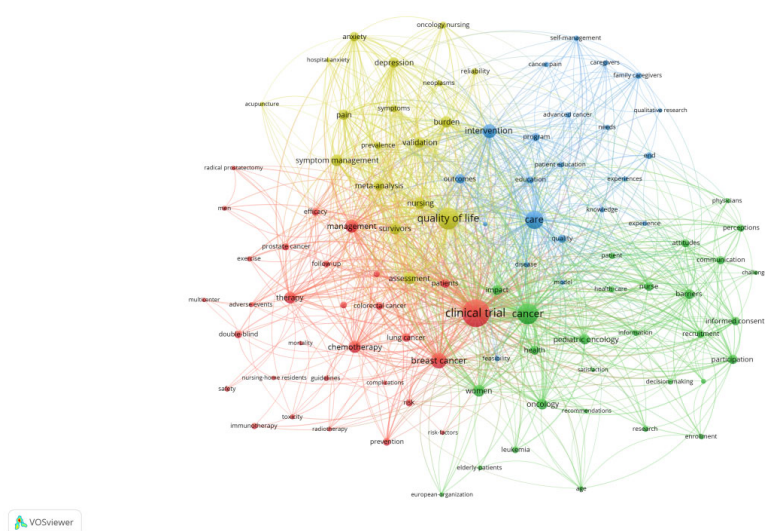


Figure 10. Keyword Clustering Map in the Field of Oncology Clinical Trial Nursing Research

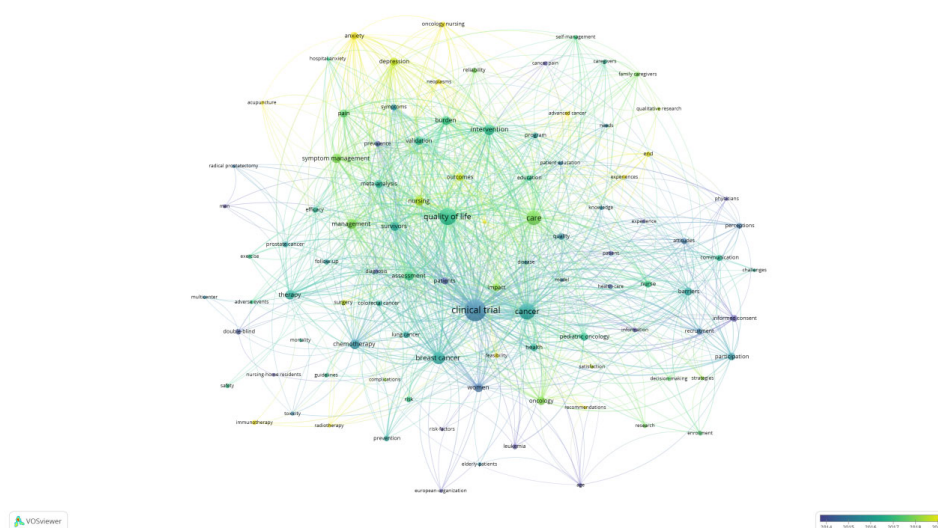


Figure 11. Timeline View of Keywords in the Field of Oncology Clinical Trial Nursing

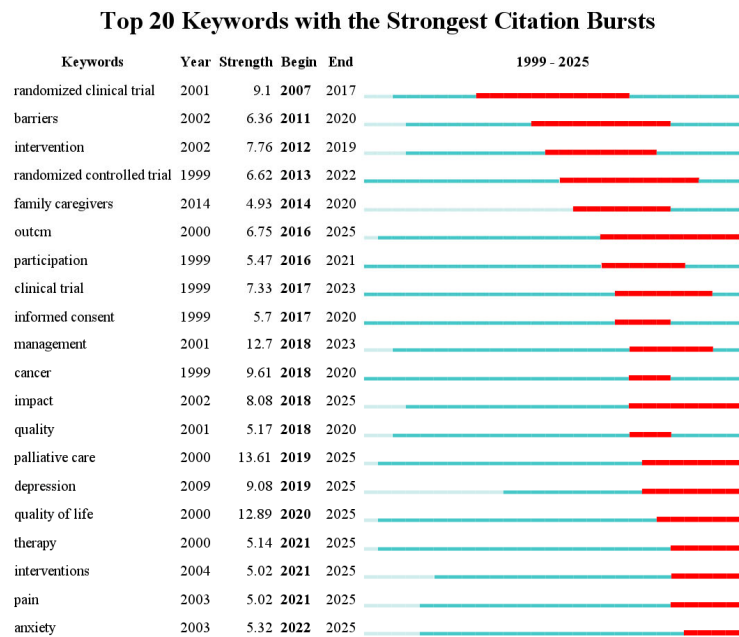


Figure 12. Citation burst intensity map of the top 20 keywords

4. DISCUSSION

This study systematically analyzes the research trends, knowledge structure, and frontier evolution in the field of oncology clinical trial nursing from 1999 to 2025 based on bibliometric methods. The study reveals the spatiotemporal distribution characteristics, academic power structure, and thematic evolution paths in this field, indicating that the research focus has gradually shifted from disease-centered to patient-centered approaches.

4.1. Publication Trends

The annual publication volume shows a significant three-stage growth trend: the inception period (1999-2002) focused on the safety and efficacy of drugs themselves, with nursing work in clinical trials primarily serving as an auxiliary role, and its independent academic value had not yet been widely recognized [20]. The slow growth period (2003-2015) was marked by stricter ethical requirements in clinical trials, which underscored the importance of nursing contributions to participant safety and data quality, leading to a steady accumulation of scholarly outputs [21]. The rapid growth period (2016-2025) coincided with the expansion of precision medicine, immunotherapy, and personalized treatment, resulting in more complex trial designs and greater demands on nurses, including early identification of adverse events, remote nursing interventions, and management of decentralized trials [6 – 8]. During this period, nurses moved from a largely auxiliary role to become core care providers and active participants in intervention-related decisions, contributing to the rapid expansion of research in the field [22]. The fitted trend line indicates that publication volume is likely to continue rising in the foreseeable future.

4.2. National, Institutional, and Author Influence

The United States and its leading research institutions have long dominated this field, closely related to their advantages in research funding, infrastructure, and talent reserves, reflecting the decisive role of economic strength in high-level scientific output [23]. Although a certain international cooperation network has been formed, it shows significant structural imbalance: research activities are mainly concentrated in high-income countries and regions, while the academic participation and international visibility of low- and middle-income countries,

especially developing countries, remain relatively limited [24,25]. This is mainly influenced by factors such as research budgets, the maturity of clinical trial systems, and limited access to high-impact journals. To promote scientific equity and global knowledge sharing, it is necessary to promote equal transnational cooperation mechanisms, establish regional special funds and open access support systems, and enhance the participation and academic discourse of research teams from various countries [26,27]. Scholars such as Miaskowski C, Mccorkle R, and Mitchell SA have made outstanding contributions in symptom management, patient-reported outcomes, and nursing interventions, forming stable research teams and advancing clinical practice and academic progress [28,29,30]. However, author collaboration still shows isolated distribution characteristics, and it is necessary to strengthen cross-author, cross-institutional, and even transnational cooperation to build a closer academic community [31].

4.3. Journals

Research results are mainly published in specialized nursing journals such as "Oncology Nursing Forum" and "Clinical Journal of Oncology Nursing," reflecting the specialized nature of the discipline. Co-citation network analysis shows that field research relies on high-impact clinical medical journals such as "Journal of Clinical Oncology," "The New England Journal of Medicine," and "Lancet Oncology," indicating that its research paradigm closely follows the forefront of evidence-based medicine, focusing on translating high-level clinical evidence into nursing practice. In addition, journals such as "Psycho-Oncology" and "Supportive Care in Cancer" are highly cited, showing the field's high emphasis on psychosocial support and symptom management [32,33]. Although the citation frequency is high, the impact factors of most highly cited journals are relatively limited, suggesting that the field still needs more methodologically rigorous, high-evidence-level prospective studies and randomized controlled trials to enhance academic influence and research credibility [34]. From an interdisciplinary perspective, oncology clinical trial nursing has transcended traditional nursing categories, requiring nurses to master composite skills such as clinical trial design and management, symptom management, patient-reported outcomes, data analysis, and patient-centered health education [7,35].

4.4. Thematic Evolution and Frontier Trends

We did a keyword clustering analysis and looked at the literature. In oncology clinical trial nursing, there are four main research topics. They are clinical treatment, doctor-patient communication, supportive care, and symptom management. These topics have changed over time. We can see how research priorities have shifted. They also give us hints about where practice and policy might be heading.

4.4.1 Clinical Treatment: Efficacy and Safety Management

We did a cluster analysis on clinical treatment research. The main keywords were "therapy," "chemotherapy," and "clinical trial." These studies looked at whether anti-tumor drugs work and how safe they are. Marcath et al. (2018) tested new anti-tumor drugs in different patient groups. They used systematic reviews and randomized controlled trials [36]. So for future clinical trials, nurses have a few jobs. They need to know how to manage drugs and watch for effects. They also need to handle side effects and check data quality. That keeps the trial results trustworthy. On the policy side, we should spell out what oncology trial nurses are responsible for—drug management and risk monitoring. We should set up regular training and performance reviews too. That way, nurses can really take charge of safety in trials.

4.4.2 Physician-Patient Communication: Informed Decision-Making and Enhanced Participation

Some research shows that doctor-patient communication and shared decision-making are getting more important in clinical trials. Words like "communication," "decision-making," and

“recruitment” come up a lot as key terms. The Gregersen T team (2022) said that good communication and shared decisions help recruit subjects faster. They also make patients trust the trial more and stick with the process [37]. So this means nurses in clinical trials can’t just follow the protocol anymore. They need to act as communication coordinators. They should help with informed consent, risk disclosure, and decision support. In practice, we should set up training that mixes psychology, ethics, and data management. That way, patients get more involved and decisions are better.

4.4.3 Supportive Care: Patient-Centered Comprehensive Management

Supportive care research focuses on a few keywords: “care,” “intervention,” and “needs.” Allen CJ and others (2023) used patient-reported outcomes and experience surveys. They found that patients have many different needs during a trial. This tells us that clinical trial nursing is changing. It used to be all about the disease. Now it’s more about the patient. So we need to think about comprehensive care, personalized interventions, and making the patient experience better. For policy and practice, nurses should take on a coordinating role—in trial design, in carrying out interventions, and in collecting data. We also need training programs that bring together oncology, psychology, data science, and nursing. That’s how we can really achieve comprehensive care [38].

4.4.4 Symptom Management: Quality of Life and Mental Health Focus

The symptom management part is all about things like “quality of life,” “pain,” and “anxiety.” Salvetti and their team (2021) ran some comprehensive programs. Those programs helped reduce pain and anxiety. And they made patients’ quality of life better [39]. We also did a keyword burst analysis. Recently, “palliative care,” “depression,” and “quality of life” have become hot topics. That tells us clinical trial nursing is now paying more attention to mental health and end-of-life care. So nursing isn’t just about treating the disease anymore. It should also care about patients’ feelings and social needs. We have evidence-based ways to improve the whole patient experience. On the policy side, maybe we need more money for psychosocial oncology, symptom research, and digital health tools. That would help turn research findings into everyday clinical practices. And it would make trial nursing more organized and more human-centered.

So, here's the takeaway. Oncology clinical trial nursing research has changed a lot over time. At first, people cared most about getting the methods right. Now, they also care about patient well-being and how to put things into practice. The research focus used to be on “randomized clinical trial.” Lately, it's shifted to things like “palliative care,” “depression,” and “quality of life.” That means the field isn't just about whether a treatment works or is safe. It's also about the patient's overall health and how they feel. So, practice and policy need to catch up. We should define roles clearly. We should set up training that covers different disciplines. We need to put more money into key areas. And we should build global networks to work together. All this would help keep oncology clinical trial nursing moving forward in a lasting way [40].

5. STRENGTHS AND LIMITATIONS

This study employed a bibliometric approach to conduct a comprehensive analysis of the field of nursing in clinical trials for cancer. By integrating multiple analytical tools, this study systematically elucidated the current status and research hotspots in this field from multiple dimensions, including publication volume, country, institution, author, and keywords. This approach not only enhanced the accuracy of the research findings but also expanded the scope of the analysis. However, this study has the following limitations: First, the data source was limited to the Web of Science Core Collection database; although this database has broad coverage, it does not include all relevant literature—particularly certain regional journals and

gray literature—which may introduce selection bias and affect the comprehensiveness of the analysis. Second, because the database is dynamically updated, there are certain differences in the datasets obtained on different search dates, posing a challenge to the reproducibility of the research results; Finally, bibliometric methods primarily use citation counts as a measure of influence, an approach that carries inherent biases: classic works published earlier may accumulate higher citation counts over time, while high-quality, innovative research published recently may fail to fully reflect its academic value due to the short time window, thereby causing the analysis results to favor historical classics over the latest breakthroughs.

6. CONCLUSION

This study employed bibliometric methods to conduct a systematic analysis of global trends in the field of nursing in oncology clinical trials from 1999 to 2025. The results indicate that the annual number of publications in this field has shown a fluctuating upward trend. The United States and its affiliated institution—Harvard University—dominate this field, not only leading in the number of publications but also maintaining an extensive international collaboration network. Through cluster analysis, this study identified four core themes: safety and efficacy management in clinical treatment; physician-patient communication and decision-making models during clinical trials; patient-centered supportive care systems; and symptom management and quality-of-life improvement. Future research should focus on strengthening resource equity and global collaboration, deepening interdisciplinary integration, and prioritizing the implementation and translation of research findings.

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