

Mapping the Research Trajectory of Social Media-Based Cancer Patient Education: A Bibliometric Analysis of WOSCC Database (2011-2025)

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Abstract

Background: Traditional cancer patient education is limited by issues related to timeliness, accessibility, and personalization. Social media has emerged as a novel platform for cancer patient education, attracting significant attention in recent years. However, a comprehensive review of the current research landscape in this domain is lacking.

Objective: This study aims to employ bibliometric analysis to identify the core journals, research institutions, and patterns of international collaboration in the field of social media - based cancer patient education. Additionally, it seeks to elucidate the research foci of high - impact publications and delineate thematic trends through keyword analysis.

Methods: Bibliometric tools, including VOSviewer, Bibliometrix, and CiteSpace, were utilized to analyze publication trends, author - and - institution collaboration networks, keyword co - occurrence, factor analysis, and thematic clusters. A total of 127 publications were retrieved from the Web of Science database, spanning the period from 2011 to 2025.

Results: Journal of Medical Internet Research is the leading journal in this field, with the highest publication output and contributing to 70% of the top 10 most - cited articles. The University of Minnesota has the highest number of publications among institutions. The United States dominate research in this area, with six of the top 10 most - productive institutions being US - based, and it also leads in international collaboration. Keyword analysis revealed three developmental stages of research in this field and highlighted five major research emphases: (1) cancer patient education across different social media platforms; (2) methods of cancer patient education and quality - of - life interventions via social media; (3) psychological and social support for cancer patients; (4) health education needs of specific patient groups; and (5) cancer information quality and misinformation detection on social media platforms. Future research should prioritize intelligent information governance and the development of precise education systems, technology - inclusive and differential - need - responsive strategies, and narrative therapy and interdisciplinary theoretical innovation to advance cancer patient education toward personalization, equity, and comprehensive coverage.

Conclusions: This study represents the first bibliometric analysis of social media - based cancer patient education, providing actionable insights to optimize digital health literacy strategies and promote patient - centered, equitable healthcare. Clinical Trial: none

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Original Manuscript

Original Paper

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Zhenning Guo: Data Analysis, Writing - Original Draft

Xiangning Zeng: Clinical Support, Data Interpretation

Gaoqiang Zhai: Data Analysis, Visualization

Denghui Zhai: Supervision, Funding Acquisition, Review & Editing

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Keywords: Social Media Platforms, Cancer Patient Education, Bibliometric Analysis, Health Literacy Enhancement, Digital Health Technology Applications

1 Introduction

The World Health Organization (WHO) forecasts that by 2040, the global incidence of new cancer cases will reach 28.4 million annually^[1]. Despite the rising incidence of cancer, significant improvements in early screening, targeted therapies, and immunotherapies over the past two decades have notably enhanced the survival rates of cancer patients. Surveillance data from 2023 indicates that the overall 5-year survival rate for cancer in the United States has increased from 49% in 1975 to 68%, while the 5-year survival rate for childhood cancers has exceeded 85%^[2]. The paradigm of cancer treatment is shifting from a disease-centered model to a health management-centered model, with patient education emerging as a crucial element. However, traditional offline medical education models face significant challenges in terms of timeliness, accessibility, and personalization, posing substantial difficulties for health education systems.

Against this backdrop, the exponential growth of social media has become a transformative solution to address the limitations of traditional cancer patient education models. With over 5

billion global users, social media platforms have emerged as a novel and powerful medium for cancer patient education^[3]. Leveraging their unique real-time interactivity, personalized content delivery, and community-based support functions, social media-based cancer patient education not only provides patients with timely and personalized information but also empowers them by enhancing their health literacy, promoting their involvement in decision-making, and fostering self-management awareness. These elements collectively promote a dynamic balance of medical power between professional institutions and individual patients.

The proportion of cancer patients seeking disease-related information on social media has increased from 38% in 2015 to 72% in 2023^[4]. Moreover, the usage rate of social media among cancer patients is 47% higher than that of the general population^[5]. Through online interactive platforms, cancer patients and their families can access a range of educational services, including dissemination of disease-related knowledge, support for treatment decision-making, psychological and emotional support, and health behavior interventions. This technology-enabled educational model provides personalized health information and promotes interaction and support among patient groups, transforming patients from mere recipients of treatment to active health managers.

However, the application of social media in cancer patient education faces significant risks in the information ecosystem. On major global platforms such as YouTube, Facebook, and TikTok, many cancer-related content lacks evidence-based support, potentially causing clinical harm^[7]. For instance, 12% of posts related to bladder cancer on Pinterest advocate urine therapy^[8]. Algorithm-driven recommendation mechanisms further exacerbate information imbalance through the “echo chamber effect.”^[9] Misinformation significantly impacts patients' decision-making. Commercialization further distorts medical education. Commercialization of healthcare significantly influences medical students' ethical stance, with a high proportion agreeing to commercial propositions^[10].

Currently, research on social media-based cancer patient education primarily focuses on enhancing information dissemination^[11], technology-driven interventions^[12], patient behavior analysis^[13], and information quality assessment^[14]. These studies are mostly empirical case analyses, emphasizing the application of social media in psychological support, treatment decision-making, and quality of life improvement. However, research in this field is increasingly fragmented, hindering a comprehensive understanding of the current status and developmental trajectory of social media-based cancer patient education. This fragmentation results in a lack of systematic insights into the knowledge structure, collaborative networks, and evolutionary pathways of the field. Although systematic reviews have examined the application of mobile health interventions in cancer patient education^[15] and factors influencing cancer patients' eHealth literacy^[16], they typically focus on specific interventions or influencing factors, neglecting the broader applications and research progress of social media in cancer patient education. Moreover, traditional reviews are often highly subjective, lacking systematic rigor and relying excessively on the authors' personal experience and selection. Manually screening and organizing literature may result in the omission of the latest research findings.

Bibliometric analysis provides a powerful framework for understanding the research landscape. Through systematic study of academic literature, it clarifies the knowledge structure, emerging themes, collaborative networks, and developmental trajectories of a particular field, thereby offering evidence-based insights for researchers, policymakers, and platform developers. Previous

studies have utilized bibliometrics to investigate the application of knowledge management on Twitter in health promotion^[17], the interdisciplinary application of big data in HIV research^[18], and trends in natural language processing in the medical field^[19]. However, to our knowledge, no bibliometric studies have specifically targeted social media-based cancer patient education.

This study employs bibliometric methods to systematically analyze the current research landscape of cancer patient education on social media platforms and explore the knowledge structure and developmental trends in this field. By conducting quantitative analyses of publication trends, co-occurrence of high-frequency keywords, thematic clustering, core authors and institutional collaborative networks, and characteristics of highly cited papers, this study aims to address the following research questions:

RQ1: What are the core journals, institutions, and researchers in the field of social media-based cancer patient education?

RQ2: How do different countries and regions collaborate in the field of social media-based cancer patient education?

RQ3: What are the main themes and popular research directions in the field of social media-based cancer patient education?

By answering these questions, this study aims to provide a theoretical integration pathway for academia, policymakers, and healthcare practitioners. It offers evidence-based insights for health policymakers to optimize the allocation of digital health education resources and data support for healthcare practitioners to design patient education programs tailored to the characteristics of the platform, thereby promoting patient empowerment.

2 Data and Methods

2.1 Data source and retrieval strategy

On March 5, 2025, we conducted a comprehensive search in the Web of Science (WoS) Core Collection using the following search expression: TS=("cancer patients" OR "oncology patients" OR "neoplasm patients" OR "cancer survivors" OR "patients with cancer" OR "malignancy patients") AND TS=("social media" OR "online platforms" OR "online communities" OR "Twitter" OR "Facebook" OR "Instagram" OR "YouTube" OR "TikTok" OR "LinkedIn" OR "Reddit" OR "WhatsApp" OR "WeChat" OR "Telegram" OR "blogs" OR "microblogs" OR "forums" OR "wikis") AND TS=("patient education" OR "health education" OR "health promotion" OR "health literacy" OR "health coaching" OR "health information" OR "patient engagement" OR "patient empowerment" OR "self - management education" OR "health communication" OR "patient support" OR "cancer education" OR "oncology education" OR "treatment adherence education" OR "symptom management education" OR "survivorship education"). The search yielded a total of 131 relevant publications. After excluding editorials, conference abstracts, letters, and non - English articles, 127 articles were ultimately included in the dataset for this study.

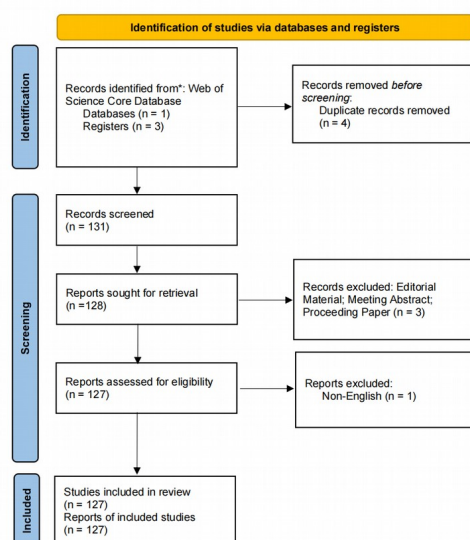


Figure 1 The PRISMA flow of the article recruitment of the current study

2.2 Data Analysis and Visualization

We performed an in-depth analysis of the screened literature data using VOSviewer 1.6.18, the Bibliometrix R package, and CiteSpace 6.4.R2. Initially, we normalized the bibliographic metadata with regular expressions and cleaned institutional names using string-matching techniques (e.g., standardizing variations in the spelling of “UNIV MINNESOTA”). We then employed the pandas library in Python to impute missing data. Subsequently, we utilized VOSviewer to generate keyword clustering maps, calculated keyword co-occurrence strength based on cosine similarity, constructed co-occurrence networks using the Minimum Spanning Tree (MST) algorithm, and labeled clusters using the Log-Likelihood Ratio (LLR).

For collaboration network analysis, we created a world map of research output using R with ggplot2 and drew a chord diagram of international collaboration using the circlize package. In the analysis of research hotspots, we generated keyword tree maps, thematic maps, factor analysis maps, and keyword evolution maps using Bibliometrix. We applied the K-means algorithm to cluster keywords in the literature and further divided themes using hierarchical clustering. Additionally, we constructed a disciplinary-related network using CiteSpace 6.4.R2 via the LLR clustering algorithm and employed the timeline view to illustrate the temporal trends of research hotspots.

3 Results

3.1 Basic information on the included studies

Figure 2 provides an overview of the key information of the collected literature. The relevant literature in this field covers the period from 2011 to 2025, involving 65 sources and producing a total of 126 publications, with an annual growth rate of 5.08%. The research involved 834 authors, among whom only 3 were single - authored, and 17.46% of the authors were involved in international collaborations. The average number of co - authors per publication was 7.02. The research included 418 author - provided keywords, with a total of 5,383 references cited across the publications. The average age of the publications was 4.86 years, and each publication was cited on average 25.96 times, reflecting the continuity and academic impact of research in this field.



Figure 2 The basic information of the included studies

Figure 3 depicts the annual publication output trend, as well as the average total citations per article and the average annual citations. The research output in this field shows a fluctuating upward trend, indicating a sustained increase in research interest. However, both the average citations per article (MeanTCperArt) and the average annual citations (MeanTCperYear) have exhibited an overall decline.

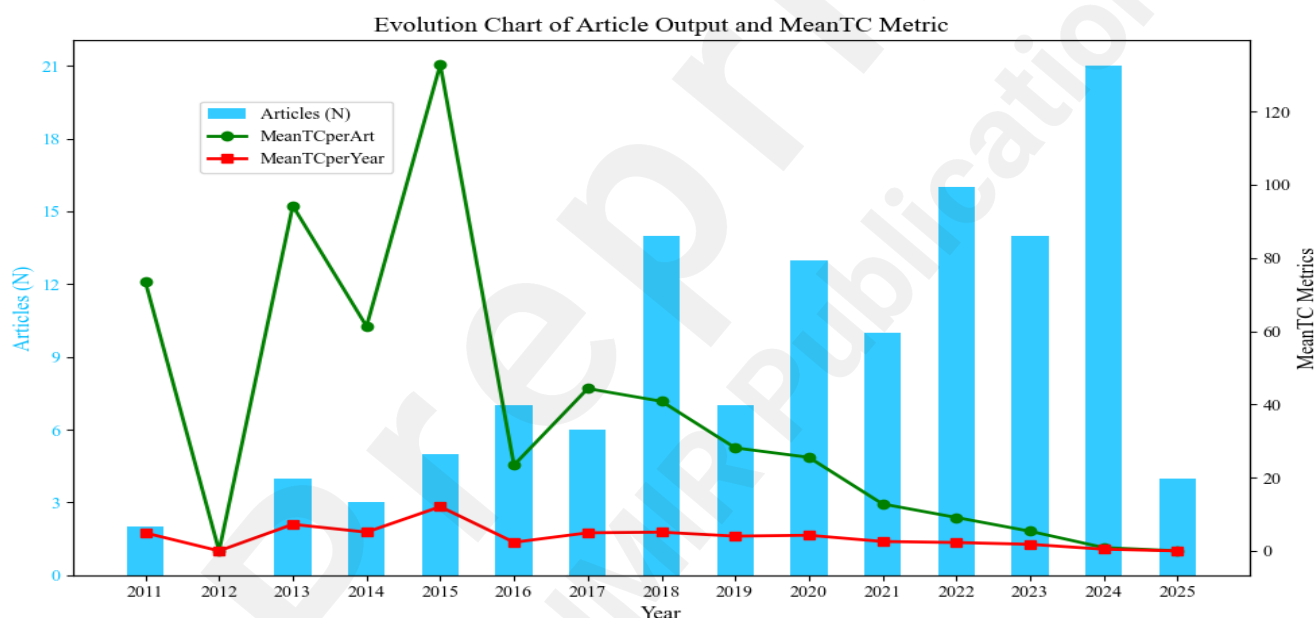


Figure 3 Evolution Chart of Article Output and MeanTC Metrics (MeanTCperYear : Mean Total Citations per Year; MeanTCperArt: Mean Total Citations per Article)

3.2 Analysis of Prolific Entities

Table 1 presents the high - output journals, authors, and institutions in this field. In terms of institutions, the University of Minnesota (UNIV MINNESOTA) has the highest number of publications (21), followed by the University of British Columbia (UNIV BRITISH COLUMBIA) with 16. The University Health Network (UNIV HLTH NETWORK) and the University of Toronto (UNIV TORONTO) are tied for third place, each with 15 publications. The majority of these high - output institutions are located in the United States (6 institutions) and Canada (3 institutions), with one additional institution in Ireland (UNIV COLL CORK).

Regarding journals, the Journal of Medical Internet Research leads with 17 publications, followed by Supportive Care in Cancer with 10. The Journal of Cancer Education and Journal of Cancer Survivorship each have 9 publications.

In terms of authors, no single author stands out with a significantly higher number of publications. Most authors have published two articles each, such as AGGARWAL R and BALARATNAM K. This indicates a relatively dispersed research community in this field, with no clear core group of prolific authors yet established.

Table 1 The Top 10 Journals, Institutions, and Authors by Publication Output

Sources	Articles	Affiliation	Articles	Author	Articles
JOURNAL OF MEDICAL INTERNET RESEARCH	17	UNIV MINNESOTA	21	AGGARWAL R	2
SUPPORTIVE CARE IN CANCER	10	UNIV BRITISH COLUMBIA	16	BALARATNAM K	2
JOURNAL OF CANCER EDUCATION	9	UNIV HLTH NETWORK	15	BEAUPIN LK	2
JOURNAL OF CANCER SURVIVORSHIP	9	UNIV TORONTO	15	BENDER J	2
BMJ OPEN	4	UNIV COLL CORK	11	BENDER JL	2
INTERNATIONAL JOURNAL OF MEDICAL INFORMATICS	4	UNIV COLORADO	10	BLANCO-DIAZ M	2
CANCER MEDICINE	3	UNIV SOUTHERN CALIF	10	BROWN MC	2
JOURNAL OF ADOLESCENT AND YOUNG ADULT ONCOLOGY	3	OHIO STATE UNIV	9	CHEN J	2
PSYCHO-ONCOLOGY	3	UNIV FLORIDA	9	CHOU WYS	2
BMC WOMENS HEALTH	2	UNIV TEXAS MD ANDERSON CANC CTR	9	DAVOREN	2

Further applying Bradford's Law and integrating quantifiable metrics such as impact factor, citation frequency, and publication volume, we identified four core journals in the field of social media - based cancer patient education. These include the Journal of Medical Internet Research, Supportive Care in Cancer, Journal of Cancer Education, and Journal of Cancer Survivorship. Among them, the Journal of Medical Internet Research emerged as the most influential journal in this domain (Figure 4).

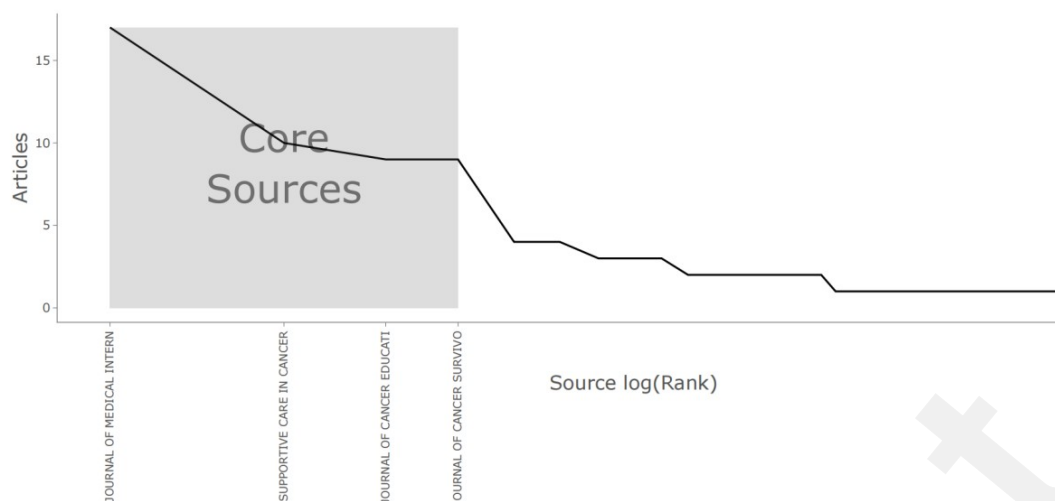


Figure 4 Core Journals in Social Media Research on Cancer Patients by Bradford's Law

The Sankey diagram (Figure 5) provides a visual representation of the interconnections among journals (left), keywords (center), and institutions (right), thereby elucidating the research themes of the most influential journals and institutions in the field of social media - based cancer patient education.

Journal of Medical Internet Research, the most influential journal in this field, is distinguished by its extensive range of topics. The keywords associated with it include "social media," "cancer patients," "health information management," "communication," "intervention," "support," and "quality of life." These connections underscore its emphasis on the application of social media in cancer patient education, with a particular focus on core topics such as patient health information management, communication - based interventions, support system development, and the enhancement of quality of life through social media platforms. The University of Minnesota, a high - output institution in this domain, is linked to keywords such as "quality of life," "outcomes," "women," and "impact."

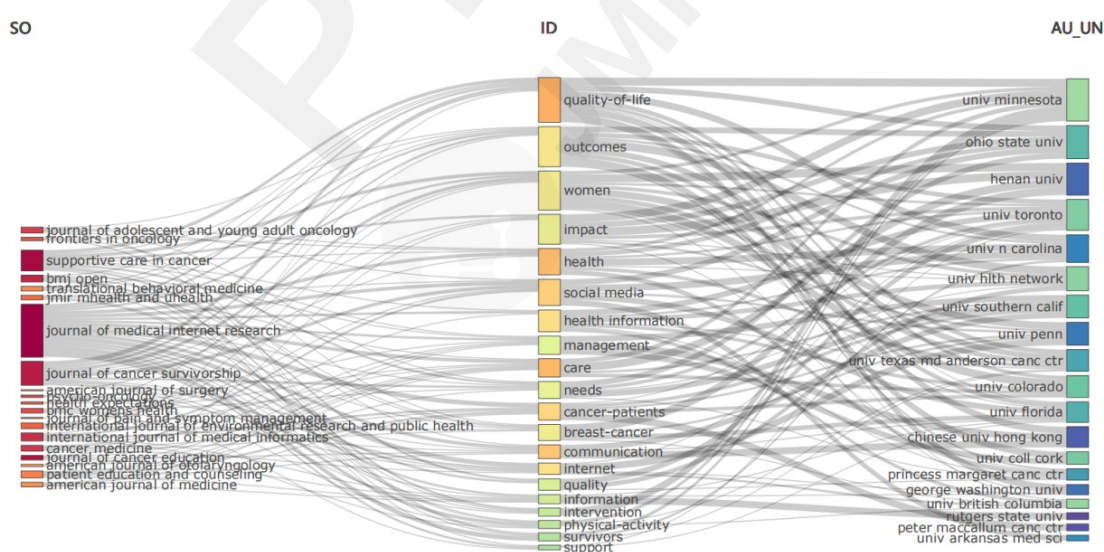


Figure 5 Sankey Diagram of Relationships Among Journals, Keywords, and Institutions

3.3 Analysis of Collaboration Network

Figures 6 and 7 depict the global research output and international collaboration within the domain of social media - based cancer patient education. The national output data are compiled in accordance with the statistical approach of Bibliometrix, which allocates the institutions affiliated with each author of a publication to the corresponding country's output tally. For example, a publication with authors from the United States, the United Kingdom, and Germany would be credited to the output of all three countries. Consequently, the aggregate output may surpass the actual count of publications. While this method accentuates the role of multinational collaboration, it accurately represents the research involvement of each country in this field.

The global output distribution map (Figure 6) reveals that the United States is preeminent in this research domain, with an output frequency markedly higher than that of other nations. This underscores the United States' robust academic engagement and substantial resource investment in social media - based cancer patient education. Other countries with notable research output include Canada, China, Australia, and Spain. Additionally, countries such as Singapore and Jordan have demonstrated some level of participation in this field.

Further analysis of institutional and national collaboration was conducted using the institutional collaboration network (Figure 7A) and the national collaboration chord diagram (Figure 7B) to reveal the collaborative trends in this research domain. Within the institutional collaboration network, "univ toronto" (University of Toronto) in Canada emerges as the largest node, with extensive collaborations with institutions such as "univ hlth network" (University Health Network), "princess margaret canc ctr" (Princess Margaret Cancer Centre), and "hosp sickchildren" (The Hospital for Sick Children). The node for "nci" (National Cancer Institute) is also prominent, forming collaborative links with "univ alberta" (University of Alberta) and "univ utah" (University of Utah), among others. Additionally, institutions such as "dana farber canc inst" (Dana - Farber Cancer Institute), "baylor coll med" (Baylor College of Medicine), "univ minnesota" (University of Minnesota), and "univ texas md anderson canc ctr" (The University of Texas MD Anderson Cancer Center) are interconnected. These institutions, predominantly focused on medical research, especially in oncology, possess a strong foundation in cancer research, specialized medical resources, and dedicated research teams. The leading institutions are primarily located in the United States and Canada, with domestic collaborations being the mainstay.

As depicted in the national collaboration chord diagram (Figure 7B), the United States occupies a central and pivotal position in international cooperation. It is interconnected with multiple countries, including Canada, the Netherlands, and Ireland, through dense collaborative links, thereby steering the core dynamics of international cooperation. Concurrently, countries such as Spain, Italy, Australia, and Belgium also exhibit extensive international collaborative networks.

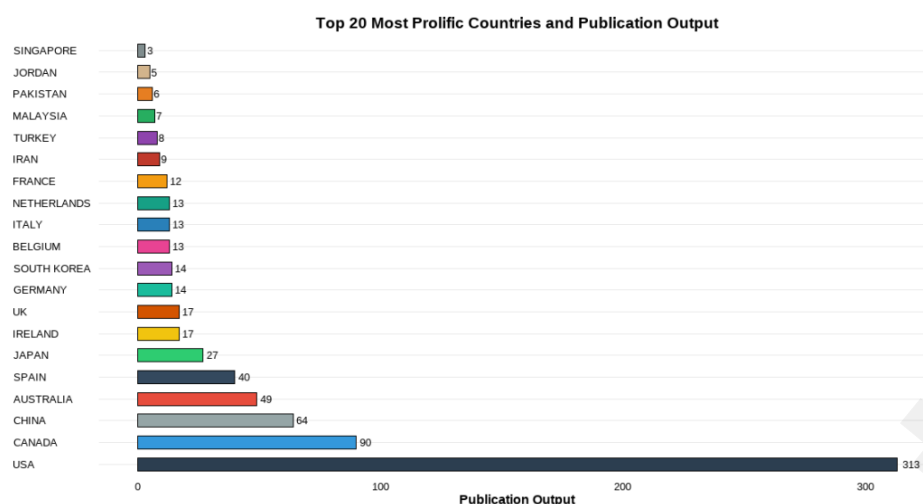


Figure 6 Top 20 Most Prolific Countries and Publication Output

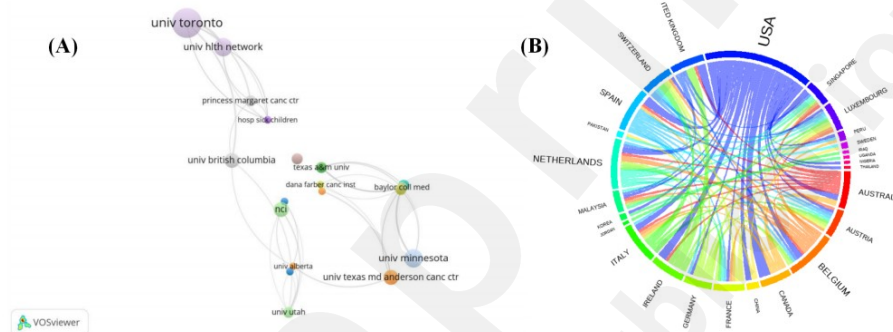


Figure 7 Collaboration Analysis (A: Institution collaboration; B: Country collaboration)

3.4 Analysis of Highly - Cited Articles

Table 2 presents the top 10 most - cited articles. In terms of research methods, the majority of the studies employed empirical research approaches (Articles 1, 2, 3, 5, and 7). Additionally, some articles utilized reviews or bibliometric analyses (Articles 2, 4, 6, and 8). Regarding the research subjects, the primary focus was on breast cancer patients (Article 1), young adult cancer patients (Articles 3 and 9), and cancer survivors in general (Articles 5 and 8). In terms of research content, the highly - cited journals mainly focused on improving patients' knowledge levels (e.g., cancer management, survivorship awareness) (Articles 1 and 5) and behavioral interventions (exercise, information - sharing behaviors) (Articles 3 and 9). Moreover, the studies also covered emotional support for cancer patients (Articles 4 and 8) and privacy issues of health research participants recruited through social media (Article 10).

Among the top 10 most - cited articles, the article with the highest total citations is the study by ATTAI DJ published in 2015 in J Med Internet Res, titled "Twitter Social Media is an Effective Tool for Breast Cancer Patient Education and Support: Patient - Reported Outcomes by Survey," which has been cited 254 times. The study used a survey method, collecting feedback from 206 participants through the Twitter breast cancer support community (#BCSM) and its associated blogs and Facebook platforms, analyzing the changes in knowledge, anxiety levels, and behaviors after their

participation in #BCSM. The study indicated that social media can effectively improve patients' knowledge levels and psychological states but should be positioned as a supplement rather than a substitute for traditional medical resources^[20].

The article with the highest TC per Year and Normalized TC is the 2018 study by SHORT CE published in J Med Internet Res, titled "Measuring Engagement in eHealth and mHealth Behavior Change Interventions: Viewpoint of Methodologies." Using a snowball sampling method, the study systematically reviewed the measurement methods of engagement in eHealth/mHealth research, comprehensively evaluating the application scenarios and cases of multidimensional tools such as qualitative interviews, self - reported questionnaires, real - time monitoring, system - usage data, sensor technology, and psychophysiological measurements. This study argued that system - usage data alone cannot fully reflect the behavioral - psychological dual dimensions of engagement and advocated for a standardized measurement system through multi - method triangulation (e.g., behavioral data + user - experience interviews) and the development of long - term tracking tools integrating micro - process indicators with macro - outcome indicators^[21].

In terms of journal distribution, 7 of the top 10 most - cited articles were published in J Med Internet Res, highlighting its core position in the research field of social media - based cancer patient education.

Table 2 Key Details of the top 10 Highly Cited Articles

	Paper	DOI	Total Citations	TC per Year	Normalized TC
1	ATTAI DJ, 2015, J MED INTERNET RES	10.2196/jmir.4721	254	23.09	1.91
2	SHORT CE, 2018, J MED INTERNET RES	10.2196/jmir.9397	220	27.50	5.38
3	VALLE CG, 2013, J CANCER SURVIV-RES PRACT	10.1007/s11764-013-0279-5	219	16.85	2.32
4	PATEL R, 2015, AM J MED	10.1016/j.amjmed.2015.06.015	158	14.36	1.19
5	CHOU WYS, 2011, J MED INTERNET RES	10.2196/jmir.1569	138	9.20	1.88
6	LI F, 2015, J MED INTERNET RES	10.2196/jmir.3326	136	12.36	1.02
7	LEE JL, 2014, J MED INTERNET RES	10.2196/jmir.3765	91	7.58	1.48
8	GROEN WG, 2015, J MED INTERNET RES	10.2196/jmir.4818	89	8.09	0.67
9	PERALES MA, 2016, CURR HEMATOL MALIG REP	10.1007/s11899-016-0313-6	86	8.60	3.67
10	BENDER JL, 2017, J MED INTERNET RES	10.2196/jmir.7029	85	9.44	1.92

information," and "attitude." It investigates chronic disease management within the healthcare system, alongside users' attitudes and utilization of online health information.

Cluster 3: This cluster focuses on the interaction between doctors and patients regarding health information, as well as patients' intentions and behaviors in obtaining health information. It includes keywords such as "doctor," "health information," "intention," and "interaction."

Cluster 4: Centering on academic research methods and content analysis, this cluster includes keywords like "journal," "content analysis," "theme," and "country." It examines content analysis methods in health - related research, research themes in journals, and research directions in different countries.

Cluster 5: Concentrating on patient health education and psychosomatic interventions, this cluster encompasses keywords such as "health education," "mental health," "physical activities," and "surgery." It investigates postoperative health education for cancer patients, mental health management, and physical activity interventions.

Cluster 6: Focusing on the application of technology and the feasibility of services, this cluster includes keywords like "technology," "feasibility," "device," and "service." It explores the application feasibility of technological devices in health services and the empowering services of technology for patients.

Cluster 7: This cluster centers on research related to specific cancer - related groups, including keywords such as "survivor," "child," "adolescent," "young adult," "gender," and "loneliness." It examines the needs and preferences of adolescent and young adult cancer survivors, as well as their online information - seeking behaviors.

The combination of keywords in each cluster covers dimensions such as medical intervention, psychological support, and the application of social resources, forming a complete thematic network that demonstrates the multidirectional exploration in the field of cancer patient education on social media platforms.

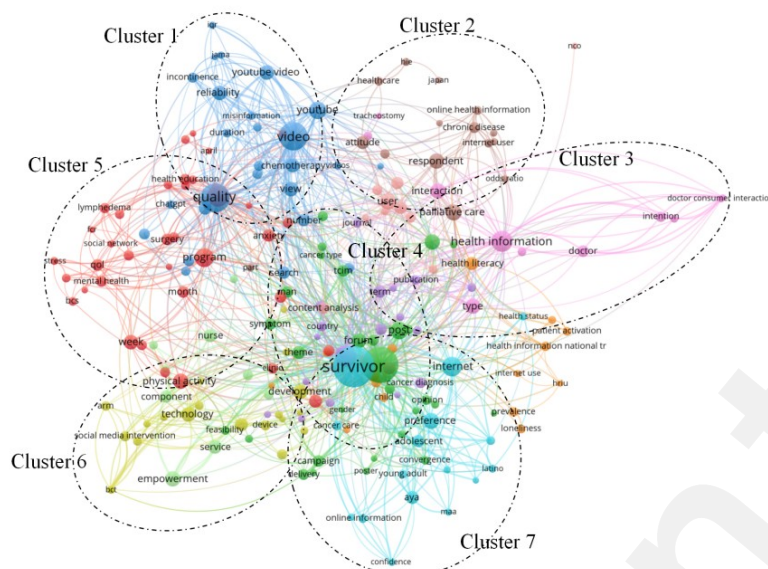


Figure 9 Keyword Clustering of Cancer Patient Education on Social Media Platforms

3.5.3 Thematic Map

In the thematic map (Figure 7), the x - axis represents Relevance (Centrality), with themes positioned further to the right indicating stronger relevance within the field. The y - axis denotes Development, with themes positioned higher indicating greater maturity in research development. The map is divided into four quadrants: the upper - right quadrant represents "Motor Themes" (core themes, which are highly relevant and well - developed), the upper - left quadrant represents "Niche Themes" (niche themes, which are less common but highly developed), the lower - right quadrant represents "Basic Themes" (basic themes, which are highly relevant but less developed), and the lower - left quadrant represents "Emerging or Declining Themes" (emerging or declining themes, which are less relevant and less developed).

In the upper - left quadrant, which represents Niche Themes, research is focused on themes within specific sub - fields that have made relatively mature progress. These include themes such as "physical activity," "reliability," "knowledge," "mortality," "prevalence," "correlation coefficients," and "fecal incontinence." These themes reflect a variety of health - related issues closely associated with cancer patient education, particularly in the areas of physiology and clinical research.

The lower - right quadrant, representing Basic Themes, displays widely - concerned foundational topics, encompassing keywords such as "health," "social media," "women," "breast - cancer impacts," "care - patients," "internet," "management," and "information." Additionally, this quadrant includes several important health - intervention - related themes, such as "outcomes," "interventions," "health - promotion," "adherence," and "diagnosis." This indicates that the role of social media platforms in cancer patient education extends beyond mere information dissemination, also involving research on health management, intervention measures, and disease prevention.

The upper - right quadrant, representing Motor Themes, and the lower - left quadrant, representing Emerging or Declining Themes, do not display independent keywords, suggesting that research themes in these quadrants are still in a dynamic developmental stage, without forming stable research trends or core issues.

Moreover, thematic terms in the central region of the coordinates, such as "quality - of - life," "intervention," "health - study," "breast," and "distress," pertain to the main research objectives of cancer patient education, including improving patients' quality of life, effective interventions, and psychological distress faced by patients during cancer treatment.

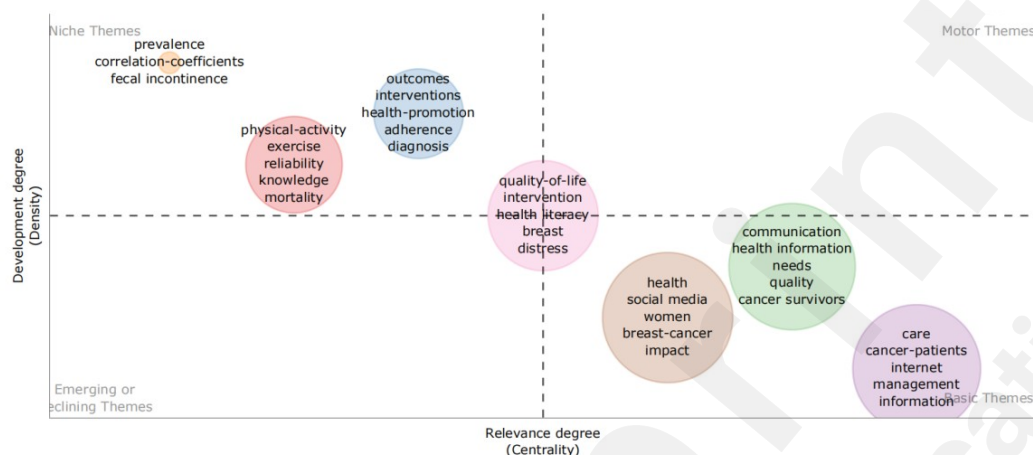


Figure 10 Theme Map of Cancer Patient Education on Social Media Platforms

3.5.4 Factor Analysis

In the factor analysis plot based on the MCA algorithm, the x - axis reflects the research emphasis ranging from "basic concepts to intervention practices." Keywords concentrated on the left side, such as "patient," "behavior," "distress," "impact," "experiences," "needs," and "quality," primarily focus on the identity characteristics, behavioral patterns, and psychological distress of cancer patients, representing studies that concentrate on exploring individual basic concepts. In contrast, keywords distributed on the right side, such as "physical activity intervention," "weight loss," "program," and "randomized controlled trial," focus on the design and implementation of interventions, covering specific intervention programs, weight - management initiatives, and the validation of intervention effects through scientific methods like randomized controlled trials. This illustrates the research progression from theory to practice.

The y - axis delineates the progression from "individual status to proactive intervention." At the lower end, keywords such as "patient," "distress," and "needs" center on the individual states and requirements of cancer patients, underscoring the comprehension of their fundamental conditions. Conversely, the upper portion is dominated by keywords like "health promotion," "management," and "physical activity intervention," which highlight the development and execution of proactive intervention strategies, encompassing health promotion programs, management initiatives, and physical activity interventions.

By examining the distribution of these keywords along both axes, the factor analysis plot provides a systematic overview of the research framework within social media - based cancer patient education, tracing a trajectory from the examination of patients' basic states to the progressive exploration of proactive intervention pathways.

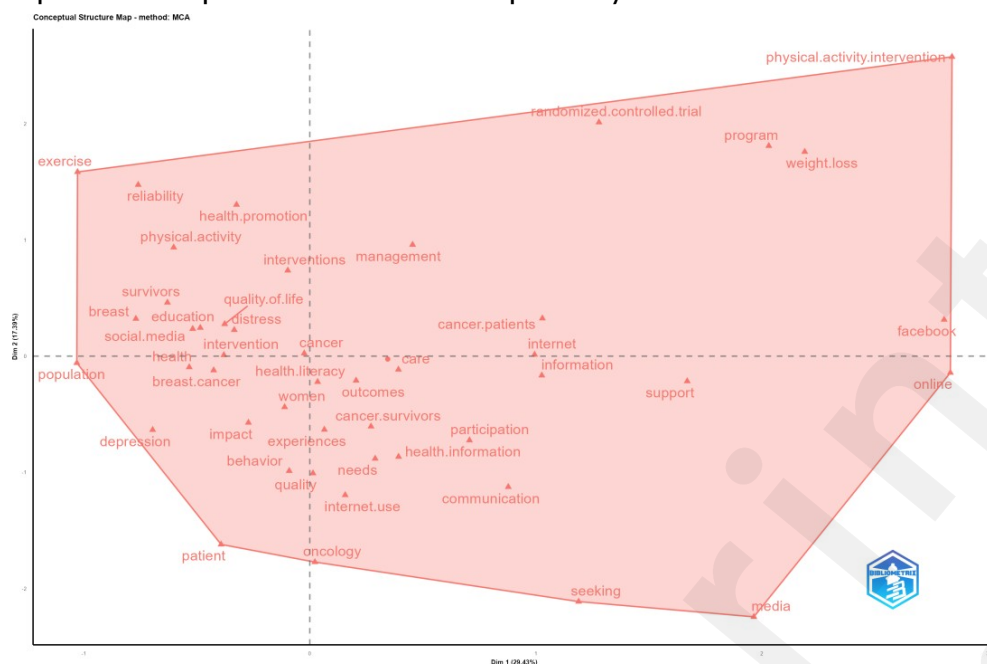


Figure 11 Factor Analysis of Cancer Patient Education on Social Media Platforms

3.5.5 Evolutionary Map of Keyword Disciplinary Categories

Figure 12 displays the keyword discipline - category evolution map produced by CiteSpace, elucidating both the disciplinary fields engaged in social media - based cancer patient education research and the temporal distribution of keywords. Eight discipline categories are annotated on the right - hand side of the map: #0 GERIATRICS & GERONTOLOGY, #1 SPORT SCIENCES, #2 PUBLIC, ENVIRONMENTAL & OCCUPATIONAL HEALTH, #3 REHABILITATION, #4 COMPUTER SCIENCE, INTERDISCIPLINARY APPLICATIONS, #5 EDUCATION, SCIENTIFIC DISCIPLINES, #6 SURGERY, and #7 HEALTH POLICY & SERVICES.

The keywords on the left - hand side are color - coded to correspond with the timeline at the top, where distinct colors signify the years when the keywords were active. The temporal evolution of keywords across different disciplines is as follows: In #0 GERIATRICS & GERONTOLOGY, early keywords centered on "cancer patients" and "health information," with subsequent additions such as "consumer health information" and "chemotherapy." In #5 EDUCATION, SCIENTIFIC DISCIPLINES, keywords transitioned from "communication" to "feasibility," "complementary medicine," and "alternative medicine." In #7 HEALTH POLICY & SERVICES, initial keywords like "management" and "health promotion" expanded to encompass "disorders," "sexual and gender minorities," and "epidemiology" in later stages.

Moreover, #3 REHABILITATION and #6 SURGERY maintained close associations with keywords such as "cancer patients" and "survivorship," underscoring the central focus on survival rates within cancer patient education in the realms of rehabilitation and surgical practice.



The trend topics map (Figure 13) visualizes the prominence of specific keywords over time, with circle size and line length indicating the duration and intensity of these bursts. The initial bursts appeared in 2013. During the early phase (2013 - 2015), keywords such as "illness," "internet use," and "online support" were particularly prominent. Around 2017, terms like "African - American," "experiences," and "health" began to emerge. Following 2019, keywords including "breast - cancer," "online," "education," "communication," "cancer - patients," and "information" successively gained prominence. From 2021 to 2023, terms such as "intervention," "quality - of - life," "internet," "needs," and "term" became more pronounced.

[unpublished, non-peer-reviewed preprint]

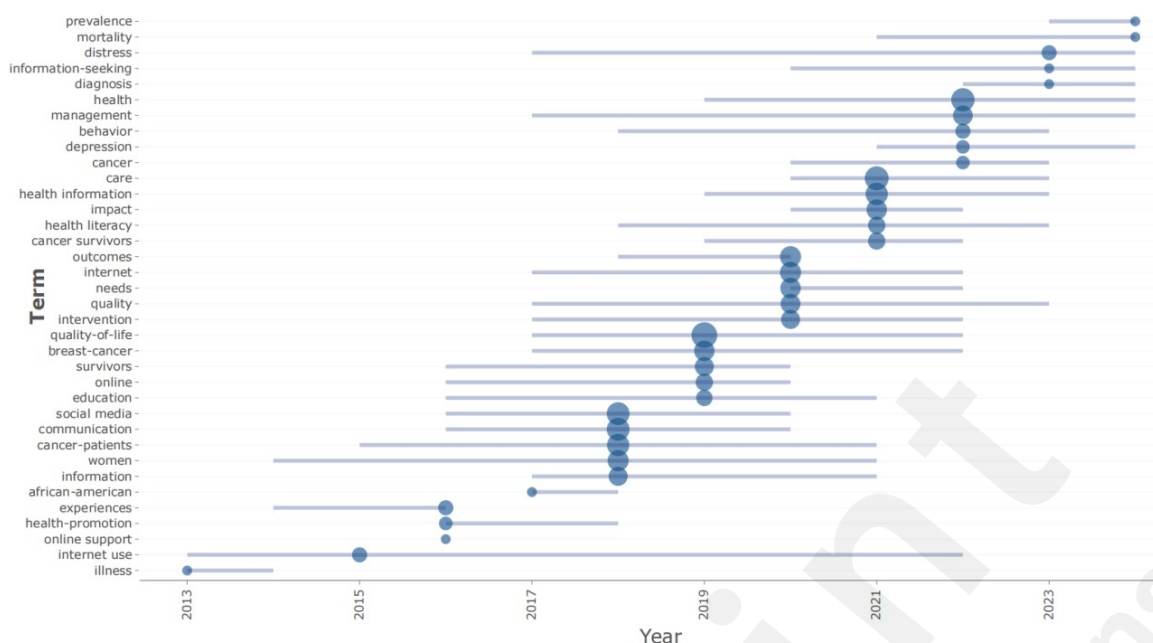


Figure 13 Trend Topics of Cancer Patient Education on Social Media Platforms

4 Discussion

4.1 Basic Information

To the best of our knowledge, this study represents the first systematic bibliometric analysis of research on social media - based cancer patient education. Through a comprehensive review of the literature in this field, we identified 126 relevant publications, 834 authors, and 418 author - provided keywords from 2011 to 2025. The analysis revealed that 17.46% of the authors were involved in international collaborations, and the annual growth rate of publications was 5.08%, indicating a sustained increase in academic attention to this topic (Figure 2). Notably, the average citation frequency of the literature has shown a yearly downward trend (Figure 3), suggesting that early - published papers, as foundational studies in the field, have been extensively cited by subsequent research, thereby conferring higher academic value to individual papers. However, the recent decline in average citation frequency, apart from being influenced by the publication cycle that limits citation accumulation, also reflects a lack of innovation and limited theoretical contributions in some studies, which have failed to break through the early research paradigms. Additionally, the total annual citations have remained at a relatively low level (Figure 3), primarily due to the small number of early publications. Although these papers have a high citation frequency per paper, the overall research base is small, failing to create a large - scale accumulation of knowledge and citation effect. This trend indicates that research on social media - based cancer patient education is still in a developmental stage, with the need for more high - quality outcomes to emerge.

4.2 Publication Hierarchy and Collaboration Networks

Publications in the field of social media - based cancer patient education are highly concentrated, with the Journal of Medical Internet Research (JMIR) — the world's first open - access journal in the

field of health informatics — establishing an absolute dominant position. JMIR has published 17 articles (Table 1) and accounts for 7 of the top 10 most - cited papers (70%) (Table 2). Adhering to its mission of "medical internet," the journal focuses on the deep integration of digital health technologies with medical settings. By constructing an interdisciplinary research framework that encompasses 12 fields, including medicine, computer science, and behavioral science, it systematically explores the technological suitability and clinical value of social media in patient education.

JMIR's unique strengths are reflected in the following aspects: 1) Disciplinary foresight, as it was the first to propose the concept of "participatory medicine," promoting the transformation of patients from passive recipients of information to active managers of their health; 2) Methodological innovation, with the establishment of a rigorous multi - dimensional evaluation system (e.g., the eHealth intervention effectiveness assessment matrix), which sets technical standards for the industry; 3) International influence, through a strict double - blind peer - review mechanism (rejection rate of 68%) and an open - access policy, it attracts submissions from scholars in 23 countries worldwide, forming a research network that covers 26 sub - fields.

Compared with traditional medical journals, JMIR transcends the limitations of clinical informatics by expanding its research scope to emerging areas such as digital therapeutics, wearable devices, and social health communities. The 2015 study by ATTAI DJ, titled "Twitter Social Media is an Effective Tool for Breast Cancer Patient Education and Support: Patient - Reported Outcomes by Survey," and the 2018 study by SHORT CE, titled "Measuring Engagement in eHealth and mHealth Behavior Change Interventions: Viewpoint of Methodologies," published in JMIR, represent exemplary cases of technological application validation and methodological innovation, respectively, with citation counts reaching 254 and 220 times. These studies continue to lead the global frontier of digital health research.

At the national level, the global collaborative landscape is dominated by the United States (Figure 7). The preeminent position of the United States reflects the unique strengths of its research infrastructure. Firstly, a comprehensive support system spanning from basic research to clinical translation has been established through targeted funding from the NIH (National Institutes of Health) and the NCI (National Cancer Institute). For instance, the NCI's "Cancer Moonshot" initiative prioritizes digital health tools, directly driving research investment in the application of social media for patient education^[22]. Secondly, the deep integration of American universities with medical systems (e.g., the collaboration network between the University of Minnesota and the Mayo Clinic) provides rich clinical data resources and practical scenarios for research^[23]. Thirdly, the high degree of internationalization of the academic community, facilitated by platforms such as the AACR (American Association for Cancer Research), attracts global scholars to participate in collaborative research^[24]. These advantages in funding, policy, and collaborative networks have enabled the United States to lead the world in both publication volume and international cooperation in the field of social media-based cancer patient education (Figure 7B).

In addition to the United States, Canada also has a significant international influence in this field (Figure 7). The Canadian government has established the "Digital Health Innovation Program" through the CIHR (Canadian Institutes of Health Research), prioritizing the application of social media in chronic disease management^[25]. Moreover, Canada's universal health-care system emphasizes preventive medicine and patient-centered management, with patient empowerment

through social media platforms being a key direction. For example, the Princess Margaret Cancer Centre has developed the "My Cancer Journey" online platform, which provides cancer-related educational content through web and mobile applications (e.g., iOS/Android)^[26]. Canadian research institutions have also formed a clustered research ecosystem. The Ontario Institute for Cancer Research (OICR) has established extensive partnerships and collaborative projects with research institutions both domestically and internationally, covering multiple aspects of cancer research, including prevention, treatment, and rehabilitation^[27]. This team explores information-dissemination patterns on social media platforms by analyzing patient behavioral characteristics and information needs, such as using short-video tutorials to enhance patients' understanding and application of postoperative rehabilitation knowledge^[28].

Other nations display a pronounced disparity in research within this domain relative to the United States and Canada. Despite China's third - place ranking globally in terms of publication output (Figure 6), no Chinese institutions feature among the high - output entities (Table 1). This signals fragmented research endeavors and the lack of a core research group wielding significant international influence. It underscores the tension between research needs driven by domestic imperatives and an insufficient degree of internationalization. Furthermore, research output in this field is sparse in developing countries, hampered by constraints such as limited research funding and feeble capabilities for resource integration. The paucity of systematic exploration and representation within the international research network among developing countries highlights the necessity for bolstered global resource - sharing mechanisms and collaborative development of technical standards. Future initiatives should particularly concentrate on augmenting research capacity in underdeveloped regions to foster the depth and equilibrium of international cooperation.

4.3 Research Hotspots

Keyword analysis has further pinpointed several research hotspots in the field of social media - based cancer patient education.

4.3.1 Cancer Patient Education on Different Social Media Platforms

Research has identified specific platforms, such as YouTube (Figure 9) and Facebook (Figures 8, 11), as key vehicles for cancer patient education, increasingly contributing to patient empowerment and cancer health management.

Video - based platforms like YouTube, with their high - density audiovisual content, are emerging as vital channels for systematic learning among cancer patients. For example, research investigated the impact of educational videos on head and neck cancer patients' understanding of radiotherapy and its toxicities and found that such videos can enhance patients' comprehension and improve their levels of anxiety, depression, and quality of life^[29]. A national survey by Mitsutake et al. (2023) revealed that patients with chronic lung disease were significantly more likely to watch health - related videos on YouTube compared to other groups (OR = 1.42, 95% CI 1.05 - 1.93), confirming its efficacy in disseminating high - density medical knowledge^[30].

Facebook capitalizes on its text - and - image - based content and group - based ecosystem to disseminate educational articles and create dedicated patient communities, thereby facilitating the sharing of treatment experiences and emotional discussions. This has culminated in an integrated

model of "content dissemination + community support." For instance, patients who participated in the online support group experienced a significant reduction in depressive symptoms, as assessed by the CES-D scale. The average decrease in CES-D scores from baseline to 12 weeks was 36% in the intervention group, compared to only 4% in the control group^[31]. The use of electronic communication (e-communication) among cancer survivors was 64%. Moreover, cancer survivors who had previously sought cancer-related information or had a regular healthcare provider were more likely to use e-communication^[32]. The mediating effect model further elucidated that health literacy plays a full mediating role in this process, individuals with lower health literacy and higher levels of health care system distrust experienced greater vaccine hesitancy^[33].

Cancer patients typically utilize a combination of 2 - 3 platforms for information - seeking strategies^[34]. Studies have found that women, younger individuals, and those with higher education levels are more likely to use these platforms to access health information^[35]. However, research also indicates that older patients and those with lower education levels are 56-73% less likely to use health-related social media^[36]. This highlights the need to develop age-friendly interface designs and implement digital literacy training programs through medical institutions to ensure equitable access to health-related resources. Furthermore, there is a need to improve the online environment to encourage male, older, lower-education, and health-literacy-challenged users to access health information online.

4.3.2 Specific Methods of Social Media - Based Cancer Patient Education and Quality - of - Life Interventions

Keywords such as "health promotion," "quality of life," "health information," "communication," and "intervention" frequently appear in Figures 11 and 13. Additionally, Cluster 5 in Figure 9 focuses on patient health education and psychosomatic interventions, with related terms like "health education," "physical activities," and "surgery." Terms such as "physical activity" and "exercise" also appear in the niche themes in Figure 10, highlighting practical content related to postoperative health education, mental health management, and physical activity interventions for cancer patients. Specific methods in social media - based cancer patient education mainly include three aspects: cancer information dissemination and rehabilitation treatment, peer - based education through community interaction, and personalized education and health management driven by intelligent technologies.

Cancer information dissemination and rehabilitation treatment primarily integrate medical expertise with patient-experience-based knowledge to construct a comprehensive support system covering the entire cycle from diagnosis, treatment to rehabilitation. The core challenge lies in balancing information accessibility and quality control. For instance, educational videos that use visual and animation elements, such as 3D medical animations, can significantly improve knowledge retention. Additionally, the length and quality of the video content, as well as the engagement of the target audience, are key factors that influence knowledge retention^[37].

Peer-based education on social media platforms refers to the "emotional support - knowledge sharing" network constructed through patient communities. It leverages the empathy generated from similar experiences among patients to form an informal educational system^[38]. The core of this approach lies in empowering patients through a decentralized interaction model (e.g., treatment check-ins and symptom discussions), which addresses the information asymmetry inherent in traditional doctor-patient relationships^[39]. examined the knowledge-sharing behavior in online

health communities, highlighting the importance of social exchange theory in understanding how patients interact and share information. Findings suggest that the motivation for knowledge sharing is driven by both altruistic intentions and the expectation of reciprocity, which aligns with the peer-based education model where patients not only receive support but also contribute to the community by sharing their own experiences^[40].

Moreover, personalized recommendation systems based on artificial intelligence (AI) and big data analytics have emerged as a new trend in cancer patient education. Recent studies have demonstrated that machine-learning algorithms can dynamically generate customized educational content by analyzing patients' browsing behaviors, health data (e.g., medication adherence, symptom feedback), and social interaction preferences^[41]. For instance, tailored nutrition management plans for chemotherapy patients or exercise programs for breast cancer survivors can be created^[42]. These technologies can also monitor patients' emotional fluctuations in real-time (e.g., through sentiment analysis of language) and push psychological intervention resources or online consultation channels^[43]. Furthermore, the integration of wearable devices (e.g., smart wristbands) with social media data enables remote tracking and early warning of health indicators^[44].

4.3.3 Construction of Psychosocial Support Systems for Cancer Patients

The term "mental health" appears in Cluster 5 in Figure 9, and "distress" emerges as a burst term in recent years in the keyword evolution map (Figure 13), highlighting the importance of emotional interventions for cancer patients. The role of social media platforms in constructing psychosocial support systems for cancer patients reflects the profound transformation of the medical model from a purely biomedical approach to a comprehensive biopsychosocial model.

Social media platforms possess a dual potential in constructing psychosocial support systems for cancer patients. Social media tools such as Facebook and blogs can significantly mitigate patients' anxiety levels by offering emotional resonance and opportunities for peer experience sharing^[45]. The underlying mechanism may be associated with the "decentralized" pattern of information flow within online communities^[46], which breaks the traditional information asymmetry between doctors and patients and empowers patients.

Notably, research revealed that the improvement in emotional health through mobile - based patient - provider communication (MBPPC) is mediated by health literacy^[47], and the degree of patient activation positively moderates this path^[48]. This suggests that support systems need to integrate health - education modules to amplify intervention effects.

However, research indicates significant heterogeneity in current practices. Research revealed that the viewing rate of cancer - related health videos on YouTube among cancer patients was 37.2%, with usage significantly limited in rural areas and among groups with low health literacy^[49]. This digital divide was corroborated in the HINTS tracking study by Fareed et al. (2021): in 2018, 21.4% of cancer survivors still lacked access to online support resources, with this group predominantly characterized by older age (≥ 65 years: 58.3%), lower education (below high school: 72.1%), and minority status (African - American: 34.7%)^[50]. Such structural barriers may exacerbate health inequalities and need to be alleviated through hybrid intervention models, such as community - based digital navigator programs.

4.3.4 Differential Health Education Needs of Specific Populations

Keywords such as "African - American," "women," and "cancer survivors" appear in the keyword tree map (Figure 8), while the keyword clustering map (Figure 9) includes terms like "survivor," "child," "adolescent," "young adult," "gender," and "loneliness" in Cluster 7. Additionally, "sexual and gender minorities" emerged in 2024 within #7 HEALTH POLICY & SERVICES (Figure 12). These findings reveal multidimensional disparities in the health education needs of cancer patients.

The differential health education needs of specific populations are determined by a variety of factors. On the physiological level, adolescent and young adult (AYA) cancer survivors face unique issues such as fertility preservation and career planning, while breast cancer patients, due to the gender - specific nature of the disease, are more concerned with body image reconstruction^[51]. On the psychological level, sexual and gender minorities (LGBTQ+) exhibit information - avoidance behaviors due to experiences of medical discrimination, and their online social behaviors follow a three - stage pattern of "anonymity - semi - openness - community integration." Cultural differences are even more pronounced^[52]. African - American individuals, influenced by religious beliefs, prefer to obtain information through closed Facebook groups associated with churches, forming a "parallel information ecosystem" distinct from mainstream platforms^[53]. This disparity reflects structural health inequalities. To address these disparities, health education strategies should be tailored to the specific needs of each population, incorporating culturally sensitive approaches and targeted interventions. For instance, providing fertility preservation information for AYA cancer survivors, body image support for breast cancer patients, and fostering inclusive, safe spaces for LGBTQ+ individuals and minority groups can help bridge the digital divide and promote equitable access to health resources.

4.3.5 Assessment of Cancer Information Quality and Misinformation Identification on Social Media Platforms

In the keyword clustering map (Figure 9), Cluster 1 focuses on the quality assessment of health information dissemination through video - based media, as well as the identification of misinformation and the application of video content. The presence of terms related to misinformation, such as "quality" and "misinformation," indicates that unverified information on social media platforms has become a significant challenge in cancer patient education. Research has found that approximately 30% of cancer - related treatment content contains erroneous or misleading information, which often garners higher user engagement than evidence - based medical content^[54].

In the field of cancer patient education on social media platforms, researchers have leveraged advancements in natural language processing (NLP) and machine learning to develop comprehensive evaluation systems. One study leveraged real-world data, including clinical information, lifestyle habits, and treatment history, using automated techniques. It applied natural language processing (NLP) to analyze unstructured text data and integrated multimodal biomarkers, such as genomics, radiomics, and pathology data, to enhance the accuracy of overall survival (OS) predictions for cancer patients^[55]. Additionally, studies have explored the symptoms and associated impacts experienced by patients with non-small cell lung cancer (NSCLC) in the era of novel immunotherapies and targeted therapies by analyzing patient discussions on social media platforms^[56].

4.3.6 Evolution of Keywords and Shifting Research Focus

The analysis of the Trend Topics graph (Figure 13) reveals three distinct phases in the research on Social Media-Based cancer patient education:

Early Phase (2013-2016): This phase was characterized by a focus on fundamental medical indicators such as "internet use," "online support," and "health promotion." Research primarily explored the epidemiological characteristics of cancer and preliminary psychological interventions for patients. Social media was viewed as a tool for information dissemination, enabling patients to access psychological support and health knowledge through online communities.

Middle Phase (2017-2020): During this period, keywords such as "quality of life," "breast cancer," and "interventions" gained prominence. Research shifted toward digital technology-enabled health information dissemination mechanisms, including algorithm-driven recommendations and visual content (e.g., short videos, infographics) to enhance information reach. Additionally, concepts like "health literacy" and "health information" emphasized patients' ability to discern information quality.

Post-2020 Phase: The research perspective further diversified, encompassing epidemiological indicators (e.g., prevalence, mortality), mental health (e.g., distress, depression), health management (e.g., management, care), information behavior (e.g., information-seeking, health literacy), and patient quality of life (e.g., cancer survivors, outcomes). By 2023, emerging keywords such as "prevalence," "mortality," "distress," "information-seeking," and "diagnosis" underscored the systemic challenges of cancer prevention and control in the digital health era. Prevalence and mortality, as core epidemiological indicators, were tracked in real-time through social media big data, enabling targeted health education campaigns (e.g., customized screening awareness for high breast cancer incidence regions^[57]). The explicit expression of psychological distress (#distress) (Figure 12) reflected social media's role as an open platform for emotional expression, prompting a shift from mere knowledge dissemination to a dual-track "information-emotion" support system. #information-seeking (Figure 12) revealed cognitive biases in algorithm-driven recommendations, necessitating the development of patient-empowered health information discernment frameworks^[58]. Diagnostic research focused on social media's role in early screening awareness, leveraging user-generated content (UGC) (e.g., patient narratives of misdiagnosis) to enhance public sensitivity to cancer warning signs. This evolution marked a transition from "disease intervention" to "data-driven, full-cycle health management," integrating epidemiological surveillance, psychological support, and digital communication technologies.

The evolution of network connections in the graph (Figure 12) reveals a common three-phase trajectory across research domains: "foundational framework construction → empirical exploration of specialized areas → integration of diverse technologies." In the field of education (#4), the shift of keywords from "communication" to "feasibility" and "alternative medicine" reflects a transition in research focus from the efficiency of knowledge dissemination to the evaluation of educational practices and the scientific integration of non-traditional therapies. This trend underscores the increasing complexity of educational content production mechanisms (Figure 12).

In the HEALTH POLICY & SERVICES discipline (#7), early keywords such as "management" and "health promotion" indicate a broad focus on public health strategies, including the construction of

health management frameworks and the implementation of inclusive health promotion initiatives. Over time, the research scope expanded to include terms like "disorders," "epidemiology," and "sexual and gender minorities," signifying a shift from policy formulation to the exploration of disease distribution patterns and health disparities among specific populations. This evolution reflects a transformation in policy research from universal frameworks to differentiated management approaches.

4.4 Research Implications and Future Directions

4.4.1 Leveraging Advanced Technologies to Identify and Control Cancer Misinformation

Future research should strengthen the integration of artificial intelligence (AI) technologies with evidence-based medicine to construct a dynamically updated quality assessment and error correction system for cancer education information. On one hand, automated misinformation identification tools can be developed based on natural language processing (NLP) and multimodal data analysis (e.g., video semantic parsing^[59]). On the other hand, recommendation algorithms should be optimized to mitigate the "information cocoon" effect^[60]. Algorithms like content recommendation systems can balance user preferences with evidence levels, thereby increasing the exposure of evidence-based content^[61].

4.4.2 Exploring More Inclusive and Personalized Cancer Patient Education Solutions

Research should focus on bridging the digital divide and implementing targeted interventions for specific populations. For elderly patients, individuals with low educational attainment, and ethnic minorities, it is essential to develop age-friendly interfaces (e.g., voice interaction features) and multilingual visual content (e.g., 3D animated educational videos on YouTube^[62]). Additionally, community-based digital navigator programs can enhance technological accessibility, such as digital literacy training for cancer patients in rural areas.

For adolescents and LGBTQ+ groups, it is crucial to construct segmented educational scenarios. For instance, the "immersive storytelling" approach on short video platforms (e.g., dual-track narratives of disease performance and scientific Q&A in patient Vlogs^[63]) can cater to the information preferences of younger audiences. For gender minorities, a phased support system—ranging from anonymous to semi-open to community integration—should be designed, such as culturally adapted closed Facebook groups.

Future research could focus on combining wearable devices with social media data to create personalized recommendation systems that dynamically adapt to individual needs. Additionally, it would be important to develop models that consider health literacy levels when designing educational content. This would help shift from a one-size-fits-all approach to more targeted and effective patient education.

4.4.3 Strengthening Interdisciplinary Methods for Cancer Education through Social Media Narratives

Future research should focus on integrating interdisciplinary approaches to enhance cancer education through social media narratives. This necessitates combining insights from health communication, psychology, sociology, and digital media studies to devise comprehensive strategies that leverage the unique narrative functionalities of social media platforms. Research

could explore how to adapt narrative therapy techniques to social media to help cancer patients reconstruct their illness experiences, thereby enhancing their psychological resilience and emotional well-being.

Additionally, developing analytical frameworks to study the impact of different narrative styles and formats (such as video blogs, text blogs, and interactive posts) on patient education and support is essential. By enabling patients to share their illness narratives, they can transition from disorganized storytelling to more combative or communicative forms of expression. This shift facilitates self-affirmation and recognition from others, destigmatizes illness^[64], and enables the deconstruction and reconstruction of death-related perceptions. This mediated narrative approach not only provides a platform for emotional support and information sharing among patients but also fosters their self-healing processes, leading to positive psychological and emotional transformations.

4.5 Limitations

This bibliometric study has several limitations. First, the research relies solely on the Web of Science (WoS) database, potentially omitting relevant literature from other important databases, which may compromise the comprehensiveness of the analysis. Second, the study includes only English-language publications, neglecting research in other languages, which could lead to the exclusion of region- or language-specific studies. Third, despite efforts to select comprehensive keywords, some articles related to potential themes may have been missed, limiting the completeness of the analysis. Fourth, the study's temporal scope may exclude recently published research, affecting the timeliness and forward-looking nature of the results. Future research could address these issues by incorporating additional databases, including multilingual literature, combining qualitative and quantitative methods, and updating the data range, thereby enhancing the breadth and accuracy of the findings.

4.6 Conclusions

This bibliometric study of 127 articles on cancer patient education via social media platforms reveals trends in research output, characteristics of international collaboration, and key research hotspots. The Journal of Medical Internet Research emerged as the leading journal in this field, with the highest number of publications and seven of the top 10 most-cited articles. The University of Minnesota was the most prolific institution, with the United States dominating research output—six of the top 10 institutions are based in the U.S., and international collaborations are also U.S.-led. Through keyword analysis, this study further identified three phases of research development and five key research focuses in the field. This bibliometric study provides direction for future research, helping scholars better understand the evolution and development trends in this area. Future studies should further explore the mechanisms of social media platforms in cancer patient education, investigate innovative educational models and technological applications, and better address the diverse needs of cancer patients to improve their quality of life and health literacy.

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Conflicts of Interest

The authors declare that they have no competing interests.

Data Availability

All data generated or analyzed during this study are included in this published paper.

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Supplementary Files

Figures

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