

# A Bibliometric Analysis of Research Trends in Spousal Support for Breast Cancer Patients

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**Background:** The annual rise in breast cancer incidence is a significant issue that threatens women's health and imposes various physical and psychological effects on male spouses, while these spouses often serve as the primary source of social support for patients.

**Purpose:** To conduct a systematic analysis of publications, countries, institutions, journals, disciplines, authors, keywords, and references related to spousal support for breast cancer patients using bibliometric methods.

**Methods:** We searched the Web of Science Core Collection (WOSCC) for publications related to spousal support for breast cancer patients from January 2004 to December 2024. CiteSpace (6.4 R1, 64-bit Advanced Edition) and Microsoft Office Excel 2019 were used for bibliometric analysis and chart generation.

**Results:** Our study analyzed 672 articles in the WOSCC database on spousal support for breast cancer patients over the past two decades. These publications have exhibited a trend of fluctuating growth. Research area primarily focuses on oncology, psychology, and nursing, with findings mainly published in *Psycho-Oncology* and *Supportive Care in Cancer*. The United States, Canada, and Australia lead this research domain, with the University of California system, Duke University, and Harvard University being the principal research institutions. Laura S. Porter and Donald H. Baucom are among the most prolific authors. The main keyword clusters include #1 caregiving burden, #2 quality of life, #3 sexual health, #4 qualitative study, #5 dyadic coping, and #6 marital status. The references focus on social psychology, intimate relationships, emotional communication, and coping interventions.

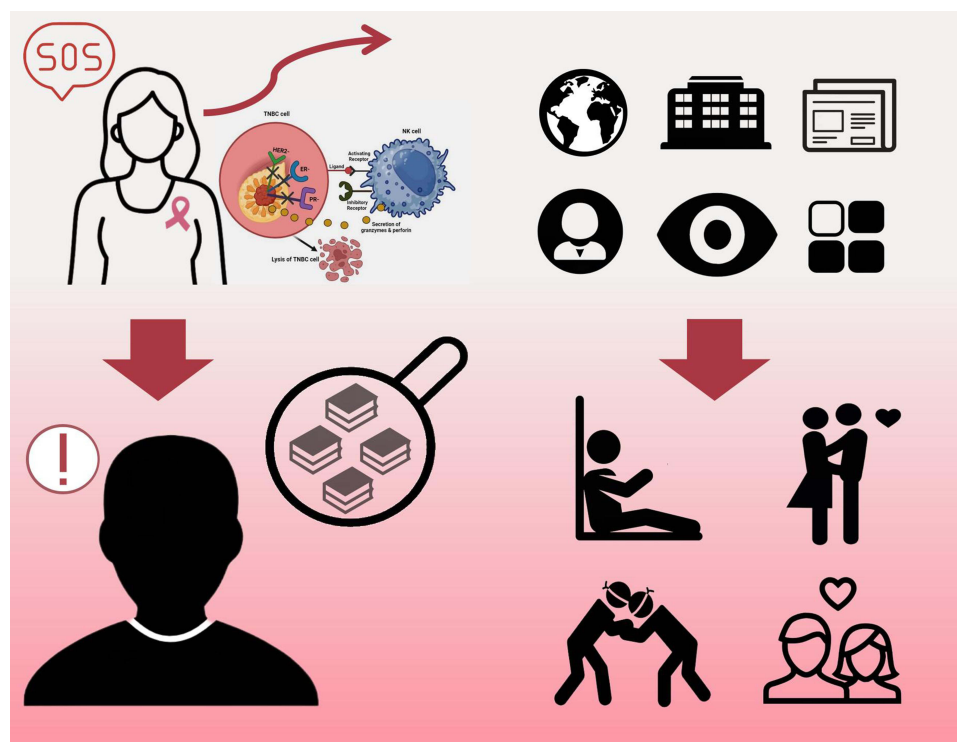
**Conclusion:** This bibliometric study analyzes research on spousal support for breast cancer patients during the last two decades, outlining the publications, countries, institutions, journals, disciplines, and authors that have significantly influenced the field. Emerging trends in research on spousal support for breast cancer patients emphasize valuing the caregiving burden endured by spouses, exploring their support experiences, identifying spousal support barriers, and addressing intimacy challenges.

**Keywords:** breast cancer, spouse support, visual analysis, cite space, review, research hotspots

## Introduction

According to the latest global cancer epidemiological data, breast cancer cases exceeded 2.3 million by 2022, rendering it the most prevalent malignant neoplasm among women.<sup>1</sup> These patients, often facing surgery, radiotherapy, or chemotherapy, suffer from significant physical burdens, such as pain, fatigue, and potential disfigurement, as well as profound psychological impacts, including anxiety, depression, and fear of recurrence.<sup>2</sup> The psychological and physical pressures faced by patients also impact their marital relationships beyond the individual level. Spouses provide essential support throughout the treatment process, playing crucial role in patient care.<sup>3</sup> However, spouses frequently encounter various stressors and challenges during caregiving, including emotional distress, role conflicts, caregiving responsibilities, and sleep disturbances, which can substantially impair the quality of support.<sup>4-6</sup> Such impairments can result in adverse outcomes for patients, including increased feelings of loneliness and helplessness, treatment discontinuation, heightened marital discord, and diminished

## Graphical Abstract



familial cohesion and stability.<sup>7</sup> Therefore, the importance of spousal support for breast cancer patients is unequivocal and has garnered considerable attention.

Although research on spousal support for breast cancer area has achieved significant progress, it remains relatively fragmented and lacks systematic analysis. Bibliometrics, a quantitative analytical method, systematically examines and analyzes the literature distribution, identifies research hotspots, and predicts emerging trends within a specific domain. This study aims to conduct systematically analysis of publications, countries, institutions, journals, disciplines, authors, keywords, and references related to spousal support for breast cancer patients using bibliometric methods, in order to comprehensively understand the research progress and emerging trends in this area.

## Data and Methods

### Data Collection

The Web of Science Core Collection (WOSCC) is highly regarded in the academic community for the authority of its the indexed journals and articles. Owing to its extensive collection of high-quality publications, comprehensive subject coverage, and high compatibility with CiteSpace, the WOSCC was selected as the primary database for data retrieval. We then conducted a search for articles on spousal support for breast cancer patients published between January 1, 2004, and December 31, 2024. Utilizing the Medical Subject Headings (MeSH) thesaurus, we developed the following search strategy:

#1 TS = ("breast neoplasm" OR "breast cancer" OR "breast tumor" OR "breast carcinoma" OR "breast malignancy")

#2 TS = ("mammary neoplasm" OR "mammary cancer" OR "mammary tumor" OR "mammary carcinoma" OR "mammary malignancy")

#3 #1 AND #2

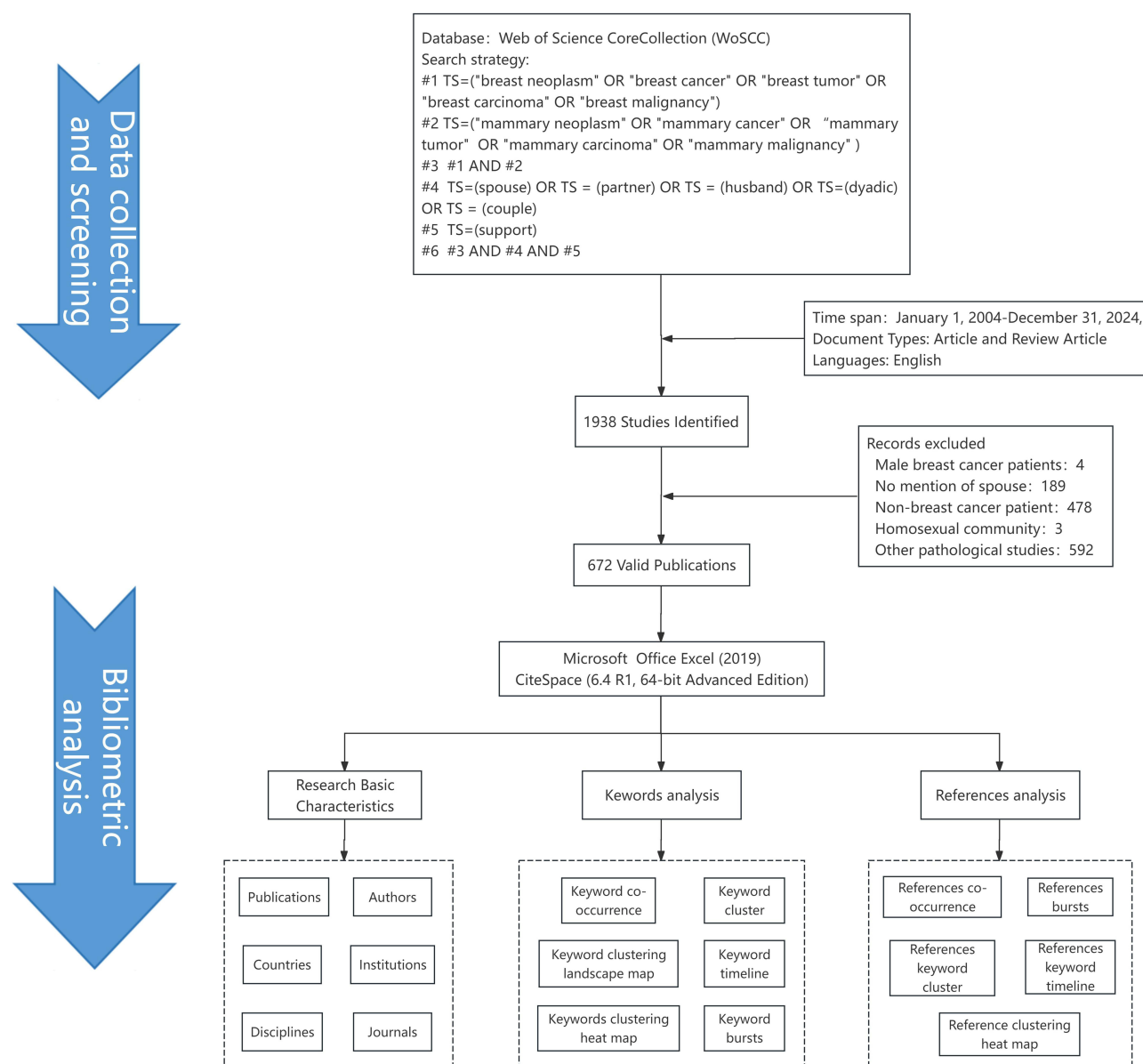
#4 TS = (spouse) OR TS = (partner) OR TS = (husband) OR TS = (dyadic) OR TS = (couple)

#5 TS = (support)

#6 #3 AND #4 AND #5.

## Data Screening

We meticulously selected the papers based on specific inclusion criteria: (1) Only research articles and reviews were included; (2) The language was restricted to English; and (3) The research content had to pertain to spousal support for breast cancer patients. The exclusion criteria included (1) studies involving male breast cancer patients; (2) research focused on the homosexual community; and (3) articles lacking full text or that had been retracted. The screening process was independently conducted by two researchers who evaluated abstracts and titles according to predefined criteria. In cases of disagreement after full-text review, a third researcher was consulted to facilitate discussion and reach consensus. Ultimately, 672 of the 1,938 publications were included in the review (Details in Figure 1).



**Figure 1** Flowchart illustrating the processes of data collection, screening, and bibliometric analysis.

## Data Analysis

CiteSpace (6.4 R1, 64-bit Advanced Edition) is a powerful visualization tool for scientific literature. It is widely used across various academic disciplines to identify research hotspots, disciplinary evolution, and collaboration networks in an intuitive and objective manner.<sup>8</sup> In this study, the parameters for CiteSpace were configured as follows: the time span from 2004 to 2024, with a one-year interval per slice; pruning was performed using both the Pathfinder and Pruning sliced network methods; the selection criterion was set to the g-index ( $k = 25$ ); the Log-likelihood Ratio (LLR) algorithm was used for clustering; and all other settings were maintained at their default values. Data collation was performed using Microsoft Office Excel 2019.

## Results

### Annual Publication and Citation Growth Trend

The annual number of publications reflects research activity and developmental trends within a specific field. A total of 672 publications on spousal support for breast cancer, published between January 2004 and December 2024, were cited 19,406 times, with an average of 37.13 citations per paper. Trends in annual publication and citation show fluctuating growth (Details in [Figure 2](#)), indicating substantial academic interest in the topic. The cumulative number of publications fits the equation  $y = 0.0265x^2 - 105.14x + 104,188$  ( $R^2 = 0.8174$ ), suggesting a steady growth trend likely to persist. Notable peaks in both the number of publications and citations were observed in 2013, 2017, and 2024. The increase in publications has contributed to a corresponding rise in citations, expanding the disciplinary knowledge base and strengthening the foundation for future research.

### Analysis of Countries and Institutions

An analysis of contributing countries and institutions reveals the dynamics of global research collaboration in this specific field. [Supplementary Table S1](#) lists the top 10 countries with the most publications on spousal support for breast cancer patients. A total of 61 countries have contributed to this research area, with the United States leading in the number of publications (309), accounting for 38.57% of the total. Four countries exhibit a centrality greater than 0.1, indicating that the United States, Australia, England, and the Netherlands are major contributors to this



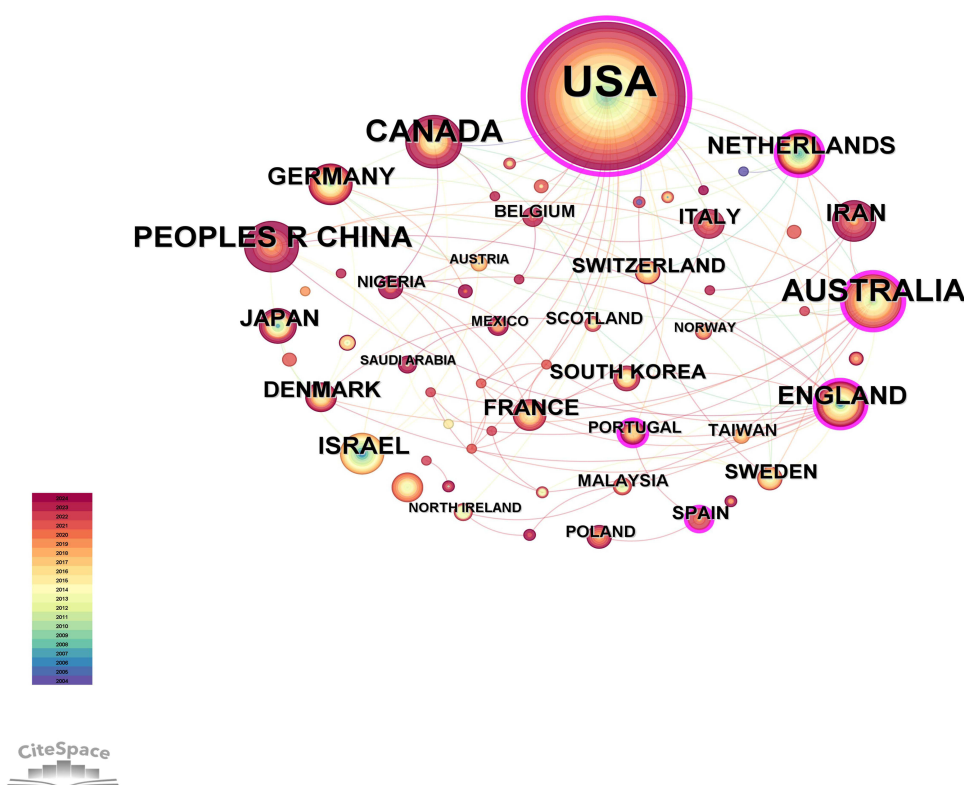
**Figure 2** Annual trends in publication and citation growth for research on spousal support in breast cancer from 2004 to 2024.



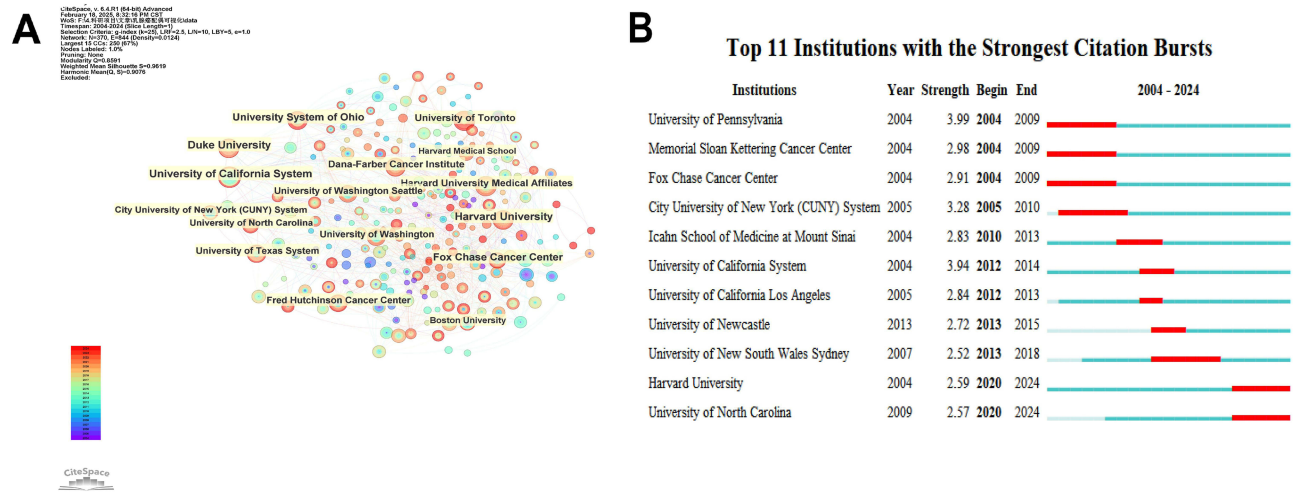
field. Currently, a research collaboration network centered on the United States has been established, maintaining close relationships with Canada, Australia, China, the United Kingdom, and other countries (Details in Figure 3). Although China has a high research output on spousal support, its centrality in the international cooperation network is relatively low (0.02), indicating potential for increased international collaboration to enhance research influence.

A total of 370 institutions generated 840 links, resulting in a network density of 0.0124. This density reflects a relatively high level of academic exchanges and collaborations among institutions. Multiple collaborative research networks have been established, with the University of California system, Duke University, and Harvard University serving as the primary institutions (Details in Figure 4A). [Supplementary Table S2](#) lists institutions that have published more than 10 papers. The University of Pennsylvania exhibited the highest burst strength (3.99). The University of Pennsylvania, Memorial Sloan Kettering Cancer Center, and Fox Chase Cancer Center were the initial emerging institutions, with their burst lasting for five years. Over the past decade, the University of New South Wales Sydney experienced the longest-lasting burst from 2013 to 2018. Its research team focused on spousal anxiety among breast cancer patients and the exploration and implementation of couple-based coping intervention programs, employing diverse research methodologies such as qualitative research, quantitative research, literature reviews, and randomized controlled trials.<sup>9–14</sup> Harvard University and the University of North Carolina, which are experiencing bursts periods lasting four years, may serve as focal points for future research on spousal support in breast cancer (Details in Figure 4B).

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WoS: F:\4.科研项目\文章\乳腺癌配偶可视化\data  
Timespan: 2004-2024 (Slice Length=1)  
Selection Criteria: g-index (k=25), LRF=2.5, L/N=10, LB=5, e=1.0  
Network: N=81, E=113 (Density=0.0617)  
Largest 1 CCs: 49 (80%)  
Nodes Labeled: 1.0%  
Pruning: None  
Excluded:



**Figure 3** Co-occurrence map of countries in the field of spousal support for breast cancer. Node size reflects publication volume, where larger nodes indicate greater output. Link thickness represents the strength of collaboration, while the colors of nodes and links correspond to the timeline. Nodes with purple rims indicate high betweenness centrality, thereby highlighting key regions within the network.



**Figure 4** Co-occurrence of institutions in the field of spousal support for breast cancer. **(A)** Co-occurrence map of institutions. **(B)** Burst map of the top 11 institutions. Node size indicates publication output, where larger nodes reflect greater contributions. Link thickness represents the strength of collaboration, while the colors of nodes and links correspond to the timeline. The blue line delineates the time axis, while the red segment indicates the results of burst detection, including the start year, end year, and duration of the burst.

## Analysis of Journals and Disciplines

The analysis of published journals and disciplines assists researchers in selecting content that aligns with their interests and identifying suitable journals for submission. A total of 13 journals, each publishing at least 10 articles ([Supplementary Table S3](#)), accounted for 45% of the total. Nearly half of these journals were published by US-based publishers. The quality of these journals is notable, with five journals categorized in JCR Q1 and three in JCR Q2. *Psycho-Oncology* and *Supportive Care in Cancer* are among the most frequently published journals.

The top 10 principal disciplines related to spousal support for breast cancer were identified ([Supplementary Table S4](#)), with Oncology (329 articles, 45.96%), Psychology (307 articles, 45.68% including Multidisciplinary Psychology, Psychology, Clinical Psychology, and Social Psychology), Nursing (117 articles, 17.41%), and Social Sciences (116 articles, 17.26%) as the most prominent (Details in [Figure 5](#)).

## Analysis of Author

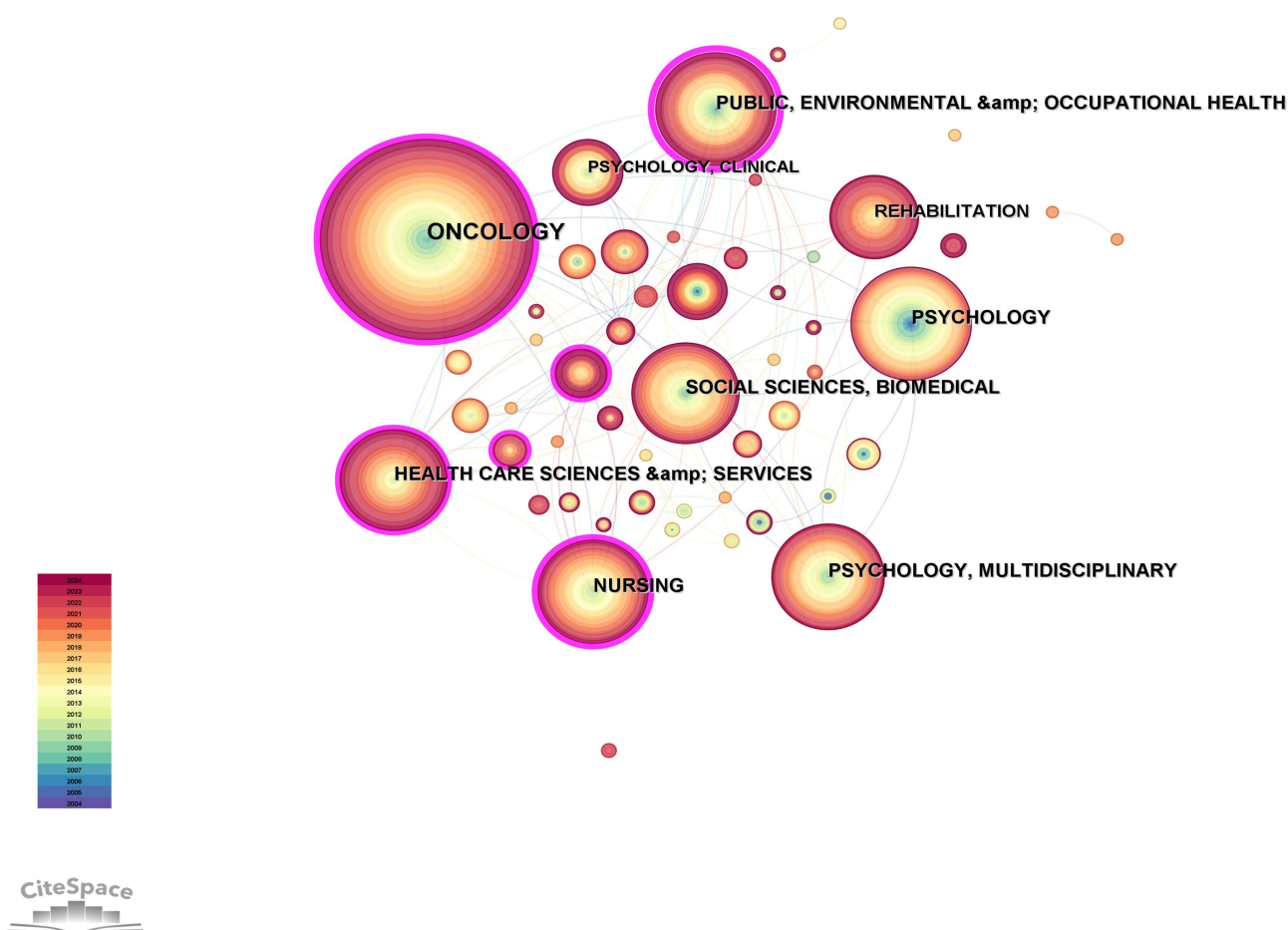
Authors with a substantial number of publications are key contributors to this field and exert a notable degree of academic influence. [Supplementary Table S5](#) lists authors with at least five publications and their citation counts. Laura S. Porter (Duke University) and Donald H. Baucom (University of North Carolina) are the most prolific authors in this domain, each having authored eight publications. Their extensive collaboration on communication strategies and psychosocial adaptation for couples facing breast cancer includes a co-authored paper that achieved an impact factor of 3.6 and was cited 136 times.<sup>15–18</sup> Additionally, Hoda Badr is the most frequently cited author per publication, averaging 105.43 citations (Details in [Figure 6](#)).

## Analysis of Hotspots and Frontiers

Keyword analysis enables the identification of current research hotspots, elucidates research trajectories, and predicts future trends. In the domain of breast cancer spousal support research, keywords occurring more than 100 times include “breast cancer” (431), “quality of life” (284), “women” (255), “social support” (213), “adjustment” (165), “psychological distress” (134), “support” (109), and “health” (108). “Distress” (0.13) and “couples” (0.12) exhibit high centrality. [Supplementary Table S6](#) lists the top 10 keywords. These keywords highlight the research focus on the quality of life, mental health status, and stress adaptation among the spouses of breast cancer patients (Details in [Figure 7A](#)).

The LLR algorithm was employed to generate 10 keyword clustering modules, as illustrated in [Figure 7B](#). In the clustering analysis, the modularity value (Q) greater than 0.3 generally indicates significant clustering structure. A silhouette value (S) greater than 0.5 is considered acceptable, while values exceeding 0.7 is convincing. In this study,

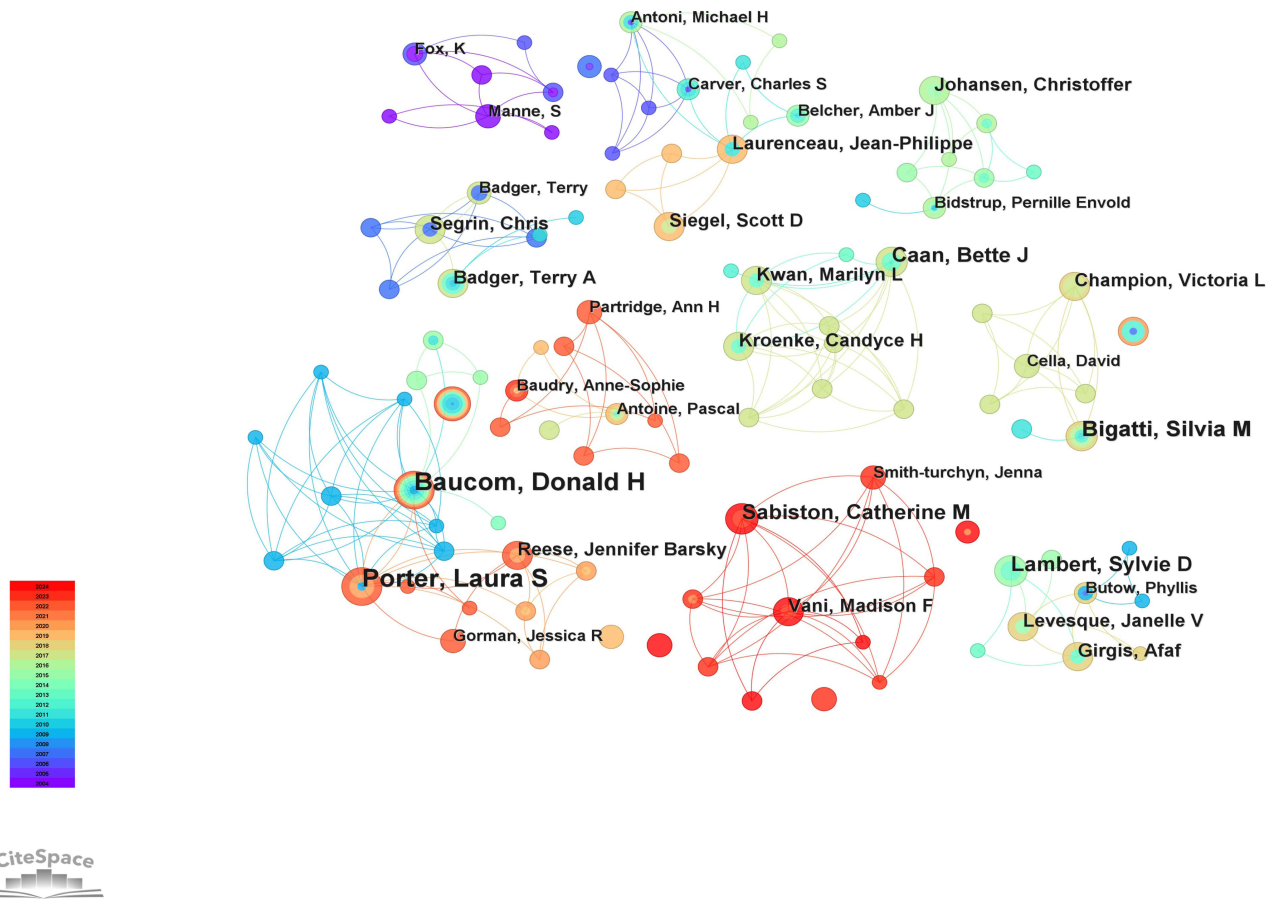
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 March 4, 2025, 8:30:25 PM CST  
 WoS: F:\4.科研项目\文章\乳腺癌配偶可视化\data  
 Timespan: 2004-2024 (Slice Length=1)  
 Selection Criteria: g-index (k=25), LRF=2.5, L/N=10, LBY=5, e=1.0  
 Network: N=52, E=115 (Density=0.0867)  
 Largest 1 CCs: 43 (82%)  
 Nodes Labeled: 1.0%  
 Pruning: None  
 Excluded:



**Figure 5** Co-occurrence map of disciplines in the field of spousal support for breast cancer. Node size reflects publication volume, where larger nodes indicate greater output. Link thickness represents the strength of collaboration, while the colors of nodes and links correspond to the timeline. Nodes with purple rims indicate high betweenness centrality, thereby highlighting key regions within the network.

the Q value of 0.4455 and an S value of 0.7489, derived from the automatic clustering label view generated by the software, indicate that the clustering results are highly reliable. The four primary clusters identified are Cluster #0 caregiving burden, #1 quality of life, #2 sexual health, and #3 qualitative study. Subsequently, we integrated these clusters and their corresponding keywords to categorize into three main clusters. Cluster 1 (#0 caregiving burden and #1 quality of life) emphasizes the stress borne by spouses and the consequent influence on their quality of life. Cluster 2 (#3 qualitative study, #4 dyadic coping, #6 psychological adjustment, #8 breast cancer screening, and #9 spouse adjustment) underscores psychological and behavioral regulation and adaptation among couples affected by breast cancer during disease progression. Cluster 3 (#2 sexual health, #5 marital status, and #7 relationship satisfaction) highlights the intimate importance of maintaining intimate and healthy marital relationships during breast cancer treatment (Details in Figure 7B).

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VoS: F14, 科研项目与文章链接, 网络可视化data  
Timespan: 2004-2024 (Slice Length=1)  
Selection Criteria: g-index (k=25), LRF=2.5, L/N=10, LBY=5, e=1.0  
Network: N=530, E=518 (Density=0.0037)  
Largest 10 CCs: 101 (19%)  
Nodes Labeled: 1.0%  
Pruning: None  
Excluded:



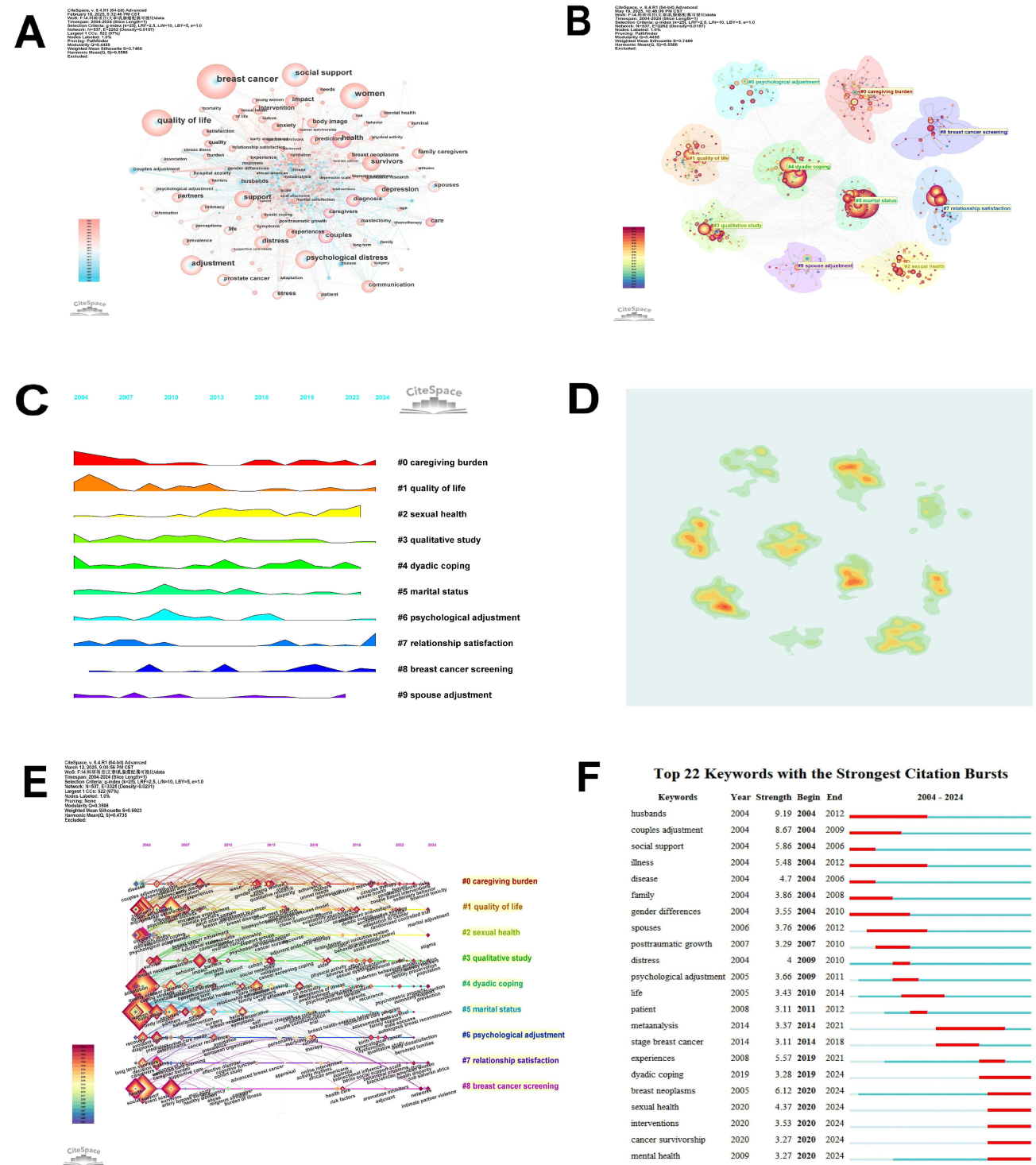
**Figure 6** Co-occurrence map of authors in the field of spousal support for breast cancer. Node size indicates publication contributions, where larger nodes reflect greater contributions. Link thickness represents the strength of collaboration among authors, while the colors of nodes and links indicate the timeline.

The landscape map takes time as the vertical axis and keyword cluster as the horizontal axis, showing a visual pattern that resembles mountain peaks. These peaks indicate the intensity of research activity and illustrate the evolution of the knowledge structure in a specific field over time. The keyword clustering landscape map identifies that the prevailing research clusters include #0 caregiving burden, #1 quality of life, #2 sexual health, #3 qualitative study, #4 dyadic coping, and #5 marital status. In 2024, cluster #7 relationship satisfaction is the most prominent research topic in 2024 (Details in Figure 7C).

The heat map feature was introduced in CiteSpace version 6.4. Clusters with orange-red areas indicate a substantial volume of publications and high activity levels, reflecting current focal points of research. In the keyword clustering heat map, the cluster #0 caregiving burden, #1 quality of life, #3 qualitative study, and #5 marital status have emerged as key research hotspots in recent years. These clusters encompass significant research content and key literature (Details in Figure 7D).

The timeline map arranges keywords within specific cluster along the horizontal axis in chronological order, illustrating their co-occurrence relationships and temporal evolution through lines and nodes. Cluster #0 caregiving burden and #1 quality of life have shown a notable shift towards a couple-centered research perspective in recent years. Clusters #2 sexual health, #4 dyadic coping, #5 marital status, #6 psychological adjustment, and #7 relationship satisfaction indicate that recent research efforts have primarily focused on developing interventions aimed at improving





**Figure 7** Research hotspots in the field of spousal support for breast cancer. **(A)** Co-occurrence analysis of keywords. **(B)** Keyword cluster map. **(C)** Keyword clustering landscape map. **(D)** Keyword clustering heat map. **(E)** Keyword clustering timeline map. **(F)** Burst map of the top 22 keywords. Nodes represent keywords, with larger nodes indicating higher frequency, while link thickness reflects co-occurrence strength. Clusters are color-coded and arranged.

marital status and trauma-coping strategies among couples. The keyword “qualitative research” appears frequently across the timeline map of different keyword clusters (Details in [Figure 7E](#)).

Burst words are defined as keywords whose frequency of occurrence significantly increases within a specific period, indicating dynamic changes and emerging trends within the research field. Figure 7F presents the top 22 keywords with

the strongest citation bursts. The keyword “husbands” exhibited the highest burst strength (9.19) between 2004 and 2012. The keyword “meta-analysis” (2014–2021) received the most sustained attention over the past decade. Recent keyword bursts, such as “dyadic coping” (2019–2024), “breast neoplasms” (2020–2024), “sexual health” (2020–2024), “interventions” (2020–2024), “cancer survivorship” (2020–2024), and “mental health” (2020–2024), suggest that current research hotspots primarily focus on dyadic coping strategies, marital relationships, and the mental health of couples (Details in Figure 7F).

## Analysis of Reference

Analysis of co-cited literature facilitates the identification of core research with significant impact and foundational knowledge within a specific field. [Supplementary Table S7](#) presents the top 10 co-cited references along with detailed information. Among the three reviews, one meta-analysis stands out due to its high centrality value of 0.22. This study challenges the conventional view of cancer’s impact on spouses’ psychological stress and advocates exploring influences beyond cancer on psychological stress.<sup>19</sup> Four studies investigating influencing factors examined the associations between dyadic coping or communication styles and outcomes such as psychological status, quality of life, or marital satisfaction.<sup>20–23</sup> Two global cancer epidemiology studies published in leading cancer-related journals (*CA: A Cancer Journal for Clinicians*) have been updated to 2022.<sup>24,25</sup> The study on qualitative research methodology has the highest citation count (36), indicating the widespread use of qualitative methods in exploring issues related to spousal support for breast cancer patients.<sup>26</sup> This finding aligns with the keyword clustering observed in the analysis.

A total of 12 keyword clusters were identified through the analysis of references, primarily focus on social psychology, intimate relationships, emotional communication, and coping interventions, particularly for young couples affected by breast cancer (Details in Figure 8A). The keyword heat map analysis of the references (Details in Figure 8B) indicates that clusters #0 psychological, #4 hope, #6 young women, and #9 emotional expression are the most prominent research topics. The timeline map of the references (Details in Figure 8C) shows that clusters #1 couple-based interventions, #7 sexual life, and #11 qualitative have experienced citation bursts, which is consistent with the findings of keyword analysis.

An analysis of citation bursts indicated that the longest duration of emergence lasted five years, with the article titled “Dyadic Coping and Relationship Functioning in Couples Coping with Cancer: A Systematic Review.”<sup>27</sup> Two articles exhibiting sustained citation bursts from 2021 to date are titled “One size fits all? What counts as quality practice in (reflexive) thematic analysis” (burst strength 6.91) and “Global Cancer Statistics 2020: GLOBOCAN Estimates of Incidence and Mortality Worldwide for 36 Cancers in 185 Countries” (burst strength 5.22).<sup>25,26</sup> The study titled “Distress in Couples Coping with Cancer: A Meta-Analysis and Critical Review of Role and Gender Effects” exhibits the highest burst strength of 10.06 (Details in Figure 8D).<sup>19</sup>

## Discussion

### General Analysis

In recent years, the incidence of breast cancer has increased, posing significant physical and psychological challenges for patients and their spouses. Spousal support is essential throughout the disease course of breast cancer patients. This study analyzed 672 articles from the WOSCC database related to spousal support for breast cancer patients over the past two decades. Between 2004 and 2024, the number of publications exhibited a fluctuating upward trend, indicating sustained interest in this topic. Research in this field primarily focus on Oncology, Psychology, Nursing, and Social Sciences, highlighting the need for interdisciplinary collaboration. The findings in this field are mainly published in the reputable journals such as “*Psycho-Oncology*” and “*Supportive Care in Cancer*.”

Currently, numerous interconnected research collaboration networks centered in the United States, Canada, and Australia have been established. Institutions such as the University of California system, Duke University, and Harvard University play pivotal roles in these networks. The latest Global Cancer Survey reveals a notable disparity: the incidence of breast cancer in France, Australia/New Zealand, North America, and Northern Europe is approximately





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four times higher than that in Central South Asia and Central East Africa.<sup>28</sup> These data further suggest that the higher incidence in developed countries naturally directs research efforts toward various aspects of the disease, resulting in a substantial body of literature from these regions. Laura S. Porter of Duke University and Donald H. Baucom of the University of North Carolina are recognized as leading scholars in the field. Their research provides a theoretical foundation and practical guidance for developing supportive interventions for couples affected by breast cancer and remains widely cited. In terms of contributions to this field, the United States plays a leading role among countries and institutions, primarily owing to its substantial financial support, advanced research facilities, and highly skilled research teams.

References constitute the foundational knowledge in this domain. Analysis of references through co-occurrence, keyword, and burst methods revealed that research on spousal support for breast cancer patients primarily focus on mental health and sexual health. Current research trends increasingly center on the psychological and emotional states of young couples affected by breast cancer, as well as their experiences in coping with the disease and the exploration of intervention strategies. The burst analysis of the references suggests that two papers are experiencing a substantial increase in academic influence: one introduces thematic analysis as an effective tool for qualitative data interpretation,<sup>25</sup> and the other reports on a global cancer epidemiological investigation.<sup>29</sup> These two publications respectively provide methodological guidance and prevalence-related information for researchers. Furthermore, a study has garnered considerable attention over an extended period demonstrates that adaptive strategies significantly enhance relationship functioning, while maladaptive dyadic coping strategies exert detrimental effects on it.<sup>30</sup> Considering the variations in definitions and evaluation standards of dyadic coping, the study emphasizes the need to reconcile differing perspectives and suggests that future research should examine the specific benefits of dyadic interventions for couples affected by breast cancer, including identifying characteristics of beneficiaries and those at risk of adverse effects, as well as evaluating their effectiveness across diverse populations.<sup>30</sup>

## Analysis of Hotspots and Frontiers

Through co-occurrence, clustering, timeline, landscape, and burst analyses of keywords, we identified three primary research hotspots related to spousal support. Firstly, Clusters #0 caregiving burden and #1 quality of life highlight the burden associated with spousal support and its impact on quality of life. Secondly, Clusters #3 qualitative study, #4 dyadic coping, #6 psychological adjustment, #8 breast cancer screening, and #9 spouse adjustment emphasize the importance of identifying obstacles and beneficial experiences in spousal support. Thirdly, Clusters #2 sexual health, #5 marital status, and #7 relationship satisfaction indicate that improving marital satisfaction for couples affected by breast cancer represents a critical research direction.

## Weighing the Burdens of Spousal Support in Dyadic Coping

When exploring the role of spousal support, it is crucial to analyze the issues revealed by the keyword clusters of “caregiving burden” and “quality of life.” Spouses of breast cancer patients face the dual burden of managing their professional responsibilities and providing care for their ill wives.<sup>31,32</sup> This dual-role responsibilities often leads to emotional predicaments, including anxiety, stress, and depression, as frequently indicated by those keywords. It is worth noting that a study indicates that the mental quality of life of these spouses is significantly poorer than that of their physical health status.<sup>33</sup> Multiple studies have consistently demonstrated that spouses of breast cancer patients are prone to experiencing high levels of anxiety and depressive symptoms during caregiving.<sup>34–37</sup> The underlying causes of these psychological disturbances are multifaceted, encompassing intense concerns about the patient’s condition, uncertainty about the treatment process, financial strain, and difficulties in adapting to new roles. These stressors can be overwhelming and may have long-term impact on the mental well-being of spouses. Community centers or hospitals should establish support groups specifically tailored for spouses of breast cancer patients, which would serve as a platform for discussing challenges, providing emotional support and practical psychological guidance, strengthening their social support networks, and preventing feelings of isolation in their caregiver roles.

The cumulative stress frequently leads spouses to adopt inadequate coping strategies. Research indicates that 44% to 54% of spouses of breast cancer patients exhibit poor role-coping and limited post-traumatic growth, which negatively

affect their overall quality of life.<sup>38–40</sup> To gain a more profound understanding of this issue, in-depth longitudinal studies on the coping strategies of male spouses are needed to identify the factors influencing the development and adaptation of these strategies over time. Meanwhile, early assessment of coping levels among spouses is crucial, yet existing evaluation tools for spousal coping in breast cancer often lack specificity. To better assess spouses' coping levels, it is essential to consider cultural context and insights from qualitative interviews. Integrating these factors can provide a more accurate and comprehensive understanding of their coping abilities, thereby facilitating the development of more targeted support strategies.<sup>41</sup>

In the digital age, mobile health (mHealth)-based interventions offer a novel approach to psychosocial support of breast cancer patients and their spouses, characterized by convenience, accessibility, and sustainability. However, further research is necessary to evaluate their efficacy and explore optimization strategies, particularly considering the crucial role of male spouses in the design of mHealth-based psychosocial interventions, as they can provide valuable insights into mobile app usage preferences, stress management skills, and privacy protection needs.<sup>42</sup> Moving forward, a comprehensive assessment of the psychological characteristics and social support systems of couples affected by breast cancer can inform the development of personalized intervention programs grounded in positive psychology. This necessitates multidisciplinary collaboration among medical professionals, psychologists, and experts from relevant fields such as sociology and rehabilitation science to provide more professional and holistic support to couples affected by breast cancer.<sup>43</sup>

### Exploring Meaningful Experiences in Spousal Support Journeys

The keyword “qualitative research” is frequently observed across diverse cluster's timelines, emphasizing its crucial role in exploring spouses' support experiences for breast cancer patients. Indeed, researchers often employ qualitative methodologies to gain a comprehensive understanding of the experiences of spouses' experiences during the support process and to analyze the valuable insights in depth. Male spouses exhibit remarkable resilience and adaptability in supporting breast cancer patients, particularly in emotional regulation, commonly concealing their own emotions to protect their loved ones carefully.<sup>44</sup> A qualitative study identified three primary dimensions of spousal support: emotional support, functional support, and informational support. Emotional support encompasses attentive care, unwavering trust, genuine comfort, and steadfast companionship. Functional support includes financial assistance, domestic tasks, childcare assistance, and providing practical help. Informational support involves providing essential information about health status, treatment options, potential side effects, and nutritional guidance.<sup>45</sup> Gao identified the supportive strategies employed by male spouses of breast cancer patients at different stages, based on interviews with spouses who have provided effective support. Following the diagnostic phase, spouses primarily focus on addressing issues under stress, including assisting patients in overcoming psychological barriers to accepting their diagnosis and providing appropriate treatment recommendations. During the treatment phase, spouses concentrate on functional compensation to counterbalance the patient's decline in self-care and domestic responsibilities. After the treatment, spouses are committed to the patient's return to social roles by adapting to the patient's physical and psychological changes and supporting their reintegration into family and social environments.<sup>46</sup> Spouses not only provide abundant and varied support but also adeptly allocate time for personal relaxation and energy restoration.<sup>34</sup> Additionally, spouses actively engage in interactions with the patient, including discussing treatment plans and making joint decisions, which are essential components of spousal support.<sup>33</sup>

The “Breast cancer screening” keyword cluster also emphasizes the importance of support from male spouses. When spouses actively promote breast cancer prevention and participate in patients' health management, these behaviors can improve patients' understanding of breast health, motivate proactive screening participation, and positively influence treatment decision-making.<sup>47</sup> A mixed-methods study indicates that women who perceive emotional and practical support from their male spouses are more likely to undergo mammography, as spousal support influences women's health beliefs and subsequently increases their engagement in breast health management behaviors.<sup>48</sup>

In brief, although spousal support manifests in various forms, such as emotional, practical, decision-making, and psychological adjustment aspects, its effectiveness is limited by various factors. On the one hand, individual patient factors, including personal needs, preferences, and personality traits, must be considered. On the other hand, cancer-related factors, such as the

nature and severity of the diagnosis and treatment protocols, also significantly influence support effectiveness. Therefore, effective spousal support necessitates a comprehensive assessment of patients' evolving needs and disease progression stages to develop tailored strategies that precisely address their requirements.

### Identifying the Stumbling Blocks in Spousal Support

The keyword clusters of “dyadic coping”, “psychological adjustment”, and “spousal adjustment” underscore the complex interactions among couples facing breast cancer, particularly regarding psychological adaptation. This adjustment process is often hindered by psychological dilemmas that may originate from the patient or their spouse. Patients and their spouses often hold different beliefs about jointly managing the illness. This disparity in coping strategies can significantly increase psychological distress of female patients and may contribute to their hesitancy in accepting support from their spouses. There are two main reasons for this: first, patients fear that accepting support from their spouses could undermine their self-esteem or self-efficacy; second, male spouses provide support influenced by their psychological burdens or maladaptive coping methods, inadvertently increasing additional psychological pressure on the patient.<sup>49</sup>

Breast cancer is typically regarded as a shared experience for couples; however, the dynamics of their relationship often undergo subtle transformations during the dyadic coping process. Affected couples may become so absorbed in their individual struggles that they fail to notice each other's emotional and psychological shifts.<sup>50</sup> This mutual oversight can lead to a weakened connection, causing couples to be less likely to discuss the illness, which in turn heightens their feelings of isolation.<sup>51</sup> Moreover, when male spouses are reluctant to express their feelings, their support needs being overlooked. This oversight may cause these spouses to perceive their coping resources as insufficient and their well-being as compromised, potentially giving rise to maladaptive coping strategies.<sup>52</sup> Research indicates that vulnerabilities among couples—such as inadequate communication, avoidant coping strategies, and difficulties in adjusting to role changes—can significantly undermine their coping confidence.<sup>53</sup> The communication resilience model serves as a valuable framework for couples affected by breast cancer, facilitating the management of communication challenges through positive meaning construction, effective emotional regulation, equality and respect, collaborative problem-solving, and a shared understanding of adversity.<sup>54</sup>

Online intervention programs such as *Couplelinks*, designed for young couples affected by breast cancer, offer a promising approach. The program incorporates various communication experiential exercises, role-playing activities, and a dedicated “chat room” for couples, creating a designated time and space to strengthen their emotional connection and promote candid, open communication.<sup>55</sup> Additionally, a 12-item scale assessing couples' communication coping strategies across four dimensions—maintaining open communication, sharing positive perspectives, avoiding negative conversations, and allocating sufficient time for communication—has demonstrated high reliability when evaluating communication quality among couples affected by breast cancer. This scale could potentially serve as a valuable tool for identifying communication patterns and needs in coping with the disease.<sup>56</sup>

In conclusion, effective communication is fundamental to the psychological adjustment process of breast cancer patients and their spouses. Therefore, communication training programs for couples are essential for equipping them with strategies to address challenging topics, enhance emotional expression, and create a safe environment for sharing feelings and understanding each other's perspectives.

### Focusing on Intimate Relationship Challenges in Spousal Support

The keyword clusters of “sexual health”, “marital status”, and “relationship satisfaction” are closely interconnected with the intimate relationships of breast cancer patients and their spouses. This topic is highly sensitive and complex, particularly for women of reproductive age, as it significantly impacts their marital relationships.<sup>57</sup> A survey indicates that 54.2% of men are hesitant to marry women diagnosed with breast cancer or who have undergone mastectomy.<sup>58</sup> Furthermore, among married women with breast cancer, some may experience abandonment or neglect by their spouses, further compromising marital stability.<sup>59</sup> This not only causes emotional distress for the patients but also weakens their support systems during this vulnerable period.

Breasts are a significant factor in female attractiveness. Following a mastectomy, women experience considerable changes in body image, including breast loss and surgical scars, which can lead to profound fear about sexual relationships with their spouses.<sup>2,60</sup> Research indicates that approximately 40% of married women have experienced the negative



effects of breast cancer, particularly following a mastectomy, on their marital relationships,<sup>61</sup> including concerns related to reproductive issues.<sup>62</sup> In contrast, women who choose breast reconstruction surgery tend to experience better emotional outcomes and a lesser decline in psychosocial wellbeing, highlighting the importance of considering such options to preserve a positive self-image and relationship.<sup>63</sup>

Sexual dysfunction is a significant concern among female breast cancer patients and their male spouses. Alarming data indicate that 88.4% of female breast cancer patients and 100% of their male spouses experience sexual dysfunction, directly contributing to decreased marital satisfaction.<sup>64,65</sup> Female breast cancer patients often describe their sexual experiences as unpleasant, painful, and difficult to sustain.<sup>66</sup> However, the problem is compounded by the fact that patients are hesitant to discuss these sexual difficulties, and healthcare professionals also routinely overlook this aspect, leaving patients without adequate support to address these challenges. To improve the marital quality of life, it is essential to encourage patients to open up about their sexual health issues and seek appropriate help.<sup>67</sup> Additionally, healthcare providers should receive specialized training on sexual issues in breast cancer patients, including initiating conversations about sexual health, assessing sexual dysfunction, and recognizing when to refer patients to specialists. With such knowledge and skills, healthcare providers can more effectively serve as the first point of contact for addressing the sexual health concerns of breast cancer patients.

For young couples affected by breast cancer, timely sexual health education and personalized fertility counseling are essential priorities.<sup>68</sup> Although no single approach is universally effective for sexual health treatments,<sup>69</sup> a systematic review indicates that successful strategies may include a combination of sex therapy, spousal support, communication skills within couples, and targeted interventions that address body image concerns alongside the broader cancer experience as an integrated whole.<sup>70</sup> Regular assessments of sexual health and marital quality can facilitate early detection of marital issues, enabling healthcare providers to implement timely interventions to strengthen couples' intimate relationship.<sup>71–73</sup> Much work remains to be done to support the rebuilding of healthy and respectful intimate relationships for couples affected by breast cancer, with the goal of improving their long-term well-being, health, and overall recovery.<sup>74,75</sup>

## Limitations

The findings of this study should be considered in light of several limitations. Firstly, we selected articles only from the WOSCC database, which may impact the robustness of our conclusions. Secondly, to ensure the accuracy of literature retrieval, we did not include “family members” as search keywords, potentially resulting in the omission of a few relevant articles. Thirdly, our study focused on heterosexual couples among whom the woman had breast cancer, thereby overlooking homosexual partners' spousal support or female spousal support for male breast cancer patients.

## Conclusion

This bibliometric study analyzes research on spousal support for breast cancer patients over the past two decades, outlining the publications, countries, institutions, journals, disciplines, and authors that have significantly influenced the field. There has been a clear increase in interest in this domain, which is expected to continue into the future. The United States, Canada, and Australia are leading the charge; the University of California system, Duke University, and Harvard University are the principal institutions; and Laura S. Porter and Donald H. Baucom are the most prolific authors. Research area predominantly converges on the disciplines of oncology, psychology, and nursing with findings mainly published in *Psycho-Oncology* and *Supportive Care in Cancer*.

Furthermore, this study highlights the prevalent research focuses and emerging trends in the domain of spousal support for breast cancer patients. First, it is essential to recognize that male spouses of breast cancer patients bear significant burdens, and their stress constitutes a vital component of the support system, just as their contributions are. Second, the extensive caregiving experience of male spouses provides critical insights for refining spousal support strategies. Third, identifying the barriers to spousal support, such as communication issues, is fundamental to the developing of tailored interventions. Finally, intimate relationships are complex and often hidden, necessitating professional intervention to address challenges and enhance marital satisfaction. In summary, a comprehensive understanding

of these elements—the burdens, support experiences, obstacles, and challenges within intimate relationships—is essential for enhancing the effectiveness of spousal support and improving the quality of life for couples affected by breast cancer.

## Data Sharing Statement

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

## Ethics Approval

This article does not contain any studies with human participants or animals performed by any of the authors.

## Author Contributions

All authors made a significant contribution to the work reported, whether that is in the conception, study design, execution, acquisition of data, analysis and interpretation, or in all these areas; took part in drafting, revising or critically reviewing the article; gave final approval of the version to be published; have agreed on the journal to which the article has been submitted; and agree to be accountable for all aspects of the work.

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