

Review

Dual dimensions of psychological resilience in cancer patients: A systematic review from risk factors to protective factors

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Abstract: Guided by the dual theoretical framework of “risk-protection”, this study systematically reviews the developmental trajectory and core themes of research on psychological resilience among cancer patients. The aim is to elucidate how individuals, under various risk factor contexts, draw upon multilayered protective resources to develop positive psychological adaptation capabilities. A total of 60 core English-language publications, published between 2009 and 2025 and indexed in the Web of Science Core Collection, were included. Bibliometric analysis was conducted using the Bibliometrix tool, supplemented by qualitative coding through NVivo. This enabled the construction of a risk-protection intersection matrix and a thematic ecological map. Findings indicate a marked increase in research on psychological resilience in cancer patients since 2018, spanning multiple disciplinary domains including psycho-oncology, nursing, and health psychology. The thematic foci primarily center on individual psychological resource mechanisms, family support systems, symptom burden regulation, cultural adaptation experiences, and psychological resilience in the context of the COVID-19 pandemic. Methodologically, the research has evolved from traditional quantitative approaches to mixed methods and qualitative interviews, emphasizing the integration of subjective experience with systematic interpretation. The theoretical contributions of this study are threefold: (1) it clarifies the interactive structure between different types of risk factors and multilevel protective mechanisms, emphasizing psychological resilience as the outcome of “multi-system dynamic regulation”; (2) it reveals the mediating and moderating roles of cultural factors, social support, and family structure in the formation of resilience; (3) it proposes intervention strategies applicable at the individual, family, and community levels. This study provides systematic empirical support and analytical tools for the advancement of resilience theory, the practice of cancer care, and the development of health policy.

Keywords: cancer patients; multi-level intervention; protective factors; qualitative analysis; resilience; risk factors; systematic review

1. Introduction

Globally, cancer has emerged as one of the most critical public health challenges threatening human health [1]. According to the World Health Organization (WHO) report in 2022, cancer accounts for nearly 10 million deaths annually, ranking as the second leading cause of death after cardiovascular diseases [2]. With advancements in medical technology, cancer survival rates have gradually improved. However, patients often endure intense physical suffering and psychological distress throughout the prolonged treatment process. In this context, psychological resilience has become a crucial psychological resource influencing patients’ quality of life and treatment adherence [3].

Psychological resilience is commonly defined as an individual's capacity to maintain mental health, adapt, and achieve positive reconstruction when confronted with significant stress, adversity, or traumatic events. It has emerged as a central concept receiving extensive attention in psycho-oncology and behavioral medicine in recent years [4,5]. Increasing empirical evidence suggests that psychological resilience is closely associated not only with the emotional well-being and quality of life of cancer patients but also potentially modulates immune function, treatment response, and long-term prognosis [6–9]. Nevertheless, current research on psychological resilience among cancer patients exhibits notable limitations: first, a significant proportion of the literature focuses on the impact of single factors, neglecting the systemic structure of risk and protective influences; second, research paradigms are predominantly inductive, lacking theoretical integration across multiple levels and dimensions.

Grounded in health psychology and developmental psychology, the Risk-Protective Factors Framework offers an effective structural model for examining psychological resilience [10,11]. This framework emphasizes that adaptive outcomes result from the dynamic interplay between risk factors—variables at biological, psychological, and social levels that may undermine resilience—and protective factors, which serve as resources or mechanisms that enhance individuals' adaptive capacities [4,10]. Therefore, adopting a dual perspective of “risk-protection” to systematically integrate the influencing factors of psychological resilience in cancer patients is of considerable theoretical and practical significance for elucidating underlying mechanisms and identifying intervention targets.

The present study aims to comprehensively map the developmental trajectory, research hotspots, and core themes in the field of cancer-related psychological resilience by employing a mixed-methods approach that integrates systematic literature review and bibliometric analysis under the guidance of the “risk-protection” framework. On one hand, it focuses on three major categories of risk factors—biomedical (e.g., pain intensity, treatment side effects); psychosocial (e.g., social support, coping styles); and cultural (e.g., stigma perception); on the other hand, it identifies the hierarchical structure of protective factors, including the individual level (e.g., self-efficacy), family level (e.g., attachment relationships), and community level (e.g., participation in cancer support organizations). By conducting keyword co-occurrence analysis and thematic clustering, the study seeks to construct a knowledge map of the field, illuminating both the internal mechanisms and external support pathways involved in resilience formation.

The specific objectives of this study include: (1) systematically reviewing the literature on psychological resilience in cancer patients to construct a structural classification system of risk and protective factors; (2) employing bibliometric tools to quantitatively analyze research trends and scholarly networks within this domain; (3) summarizing the theoretical foundations, methodological characteristics, and application limitations of current studies, while proposing future research directions and practical recommendations.

Through this research, it is expected to provide theoretical insights and empirical evidence for medical social work, the design of psychological interventions, and

health policy development, thereby contributing to the construction of culturally sensitive and structurally layered models for enhancing psychological resilience in cancer care.

2. Literature review

2.1. Theoretical foundations and dimensional structure of psychological resilience

Psychological resilience, originally rooted in developmental psychology and psychopathology, refers to an individual's capacity to maintain adequate psychological functioning or even achieve positive adaptation when confronted with significant stress, adversity, or trauma [12,13]. With the evolution of theoretical perspectives and measurement tools, resilience has increasingly been conceptualized not as a static trait but as a dynamic process.

Connor and Davidson [14], drawing on clinical research, developed the Connor–Davidson Resilience Scale (CD-RISC), which has become one of the most widely used instruments for assessing psychological resilience internationally. The original CD-RISC includes 25 items that measure various dimensions, such as adaptability to stress, acceptance of change, self-efficacy, emotional regulation, and spiritual beliefs. Subsequent adaptations of the scale have introduced a 10-item abbreviated version and a three-dimensional model (tenacity, resilience, and spiritual belief) to accommodate diverse populations [15].

From a structural perspective, psychological resilience is widely recognized as a multilayered, multidimensional systemic process [16]. The dominant framework in current literature conceptualizes resilience as comprising three hierarchical levels:

- 1) Individual psychological traits, including internal characteristics such as optimism, self-efficacy, and coping flexibility [17];
- 2) Relational systems, encompassing mediating variables such as intimate relationships, family support, and attachment styles [18];
- 3) Environmental resources, referring to external supports such as access to education, social welfare, and healthcare services [5,19].

This multilayered structural model underscores that psychological resilience does not operate in isolation; rather, it functions as a dynamic network continuously shaped and regulated within a broader socio-ecological system.

2.2. Current research status on psychological resilience in cancer patients

In recent years, psychological resilience has received growing scholarly attention within the field of psycho-oncology, emerging as a key variable in enhancing cancer patients' quality of life and psychological adjustment [7,20]. Bibliometric analyses reveal a continuous increase in academic publications using the keywords “resilience AND cancer” since 2010, with a particular concentration in interdisciplinary domains such as clinical psychology, nursing, and social work [21].

Current research primarily focuses on the following areas:

- 1) the relationship between psychological resilience and depression, anxiety, and post-traumatic stress disorder (PTSD) [22–24];

- 2) the impact of resilience on treatment adherence, life satisfaction, and the regulation of treatment-related side effects [25–28];
- 3) the development and evaluation of resilience-based intervention programs, such as cognitive behavioral therapy (CBT) and mindfulness training [29].

In terms of research populations, breast cancer patients represent one of the most extensively studied groups, followed by individuals with lung cancer, colorectal cancer, and lymphoma [21,30,31]. The age distribution of participants tends to be polarized, with childhood cancer survivors and older adult patients constituting two major subgroups. For instance, studies focusing on adolescents emphasize cognitive developmental characteristics and the role of social support, while research on older adults highlights the effects of physiological decline and loneliness on resilience [32,33]. Moreover, recent studies have increasingly addressed how gender, cultural background, and family structure influence the mechanisms through which resilience operates [34–36].

Regarding research design, most studies on psychological resilience adopt quantitative methodologies, employing instruments such as self-report questionnaires, standardized scales (e.g., CD-RISC, Resilience Scale [RS], Brief Resilience Scale), and structural equation modeling [37]. Qualitative studies commonly utilize semi-structured interviews and thematic analysis to explore patients' subjective experiences of resilience construction [21]. In recent years, mixed-methods research has begun to gain traction, aiming to integrate the breadth of quantitative analysis with the depth of qualitative inquiry to present a more comprehensive understanding of the structure and process of resilience [35].

2.3. Overview of the risk-protective factors theoretical framework

The risk-protective factors framework originates from developmental psychopathology and is widely used to explain why individuals exhibit different adaptive outcomes when facing similar adversities [11]. According to this framework, an individual's adaptive result is the outcome of the interaction between risk factors and protective factors.

Risk factors refer to variables that may undermine psychological adaptation, increase mental distress, or hinder the recovery process [38]. In the context of cancer, these risk factors are generally categorized into three domains: biomedical, psychosocial, and cultural. Biomedical risk factors primarily include pain intensity, side effects of treatment, and functional impairments caused by disease progression. For example, chronic pain and chemotherapy-induced discomforts—such as nausea, hair loss, and cognitive impairments—have been shown to correlate closely with increased depression, anxiety, and reduced quality of life among patients [39–41]. These physical symptoms not only directly affect emotional experiences but may also indirectly diminish patients' self-efficacy and confidence in treatment.

Psychosocial risk factors are reflected in insufficient social support; maladaptive coping styles (e.g., avoidance, complaining); and the accumulation of loneliness. Studies have found that cancer patients lacking intimate partners or supportive family systems exhibit significantly reduced psychological recovery capabilities [27,42]. Cultural factors, such as illness-related stigma, are gaining increasing attention. In

certain cultures, cancer is labeled as “shameful” or “ominous”, leading some patients to socially withdraw due to fear of societal judgment, thereby weakening their social interactions and psychological resilience [43].

Conversely, protective factors refer to resources and mechanisms that buffer the negative effects of risk factors and enhance individual resilience and adaptability [44]. These factors operate at multiple levels, forming a multidimensional protective system. At the individual level, self-efficacy is a critical psychological resource. Bandura posited that self-efficacy enhances one’s perceived control over illness, boosting confidence in managing treatment side effects and uncertainties about the future [45,46]. Studies show that patients with high self-efficacy exhibit better emotional regulation, greater adherence to treatment, and a more positive outlook on life [47].

At the family level, secure attachment relationships serve as key protective mechanisms. Stable intimate relationships offer emotional comfort and practical caregiving, helping buffer the psychological impacts of external stressors [48]. One study noted that cancer patients with supportive intimate networks demonstrate significantly improved quality of life and coping capacity [49]. At the community level, participation in cancer support organizations and peer support groups plays a similarly vital role. These platforms not only provide informational and medical resources but also foster a sense of belonging and hope, promoting positive social identity and emotional resonance [50,51].

In addition, social ecological systems theory emphasizes the multilayered, nested structure of individual psychological functioning. It posits that the development and maintenance of resilience are influenced by interactions among microsystems (e.g., family, hospital); mesosystems (e.g., neighborhood, workplace); and macrosystems (e.g., cultural norms, public policy) [52]. In cancer contexts, this theory is instrumental in revealing how individuals dynamically regulate their responses to competing pressures and sources of support.

Finally, in health psychology, resilience interventions have gradually shifted from isolated treatment approaches to systemic interventions. The multi-dimensional intervention framework, for example, advocates for integrating cognitive training (such as CBT) with family support, physician–patient communication, and strategies for social participation. This forms a bio-psycho-social intervention pathway aimed at enhancing sustained resilience throughout and beyond the treatment period [53].

In summary, the risk factors faced by cancer patients are multifaceted and interactive, spanning physiological, psychological, and socio-cultural dimensions. The protective factors, in contrast, operate across levels and systems, facilitating resource integration that strengthens psychological resilience, enhances treatment adherence, and improves overall quality of life. The analytical framework based on risk-protective interactions offers a comprehensive lens to understand the mechanisms underlying resilience and provides a theoretical foundation for clinical interventions. Increasingly, psychological resilience has been recognized as a pivotal variable in the cancer adaptation process, and current research trends reflect a shift toward multidimensional structural models, theory-driven risk-protective analyses, and the integration of quantitative and qualitative methods. Building on this theoretical foundation, the present study employs bibliometric analysis and systematic

review methodologies to investigate the dynamic mechanisms and pathways influencing psychological resilience in cancer patients.

3. Methodology

To systematically review the research development on psychological resilience in cancer patients, the thematic focus on risk, protective factors, and their interactive mechanisms. This study adopts a methodological approach that combines systematic review with bibliometric analysis. A thematic classification and analytical model based on the risk-protective factors theoretical framework is constructed. This chapter provides a detailed account of the literature retrieval and screening procedures, the technical path and tool application for bibliometric analysis, as well as the methods of thematic categorization and qualitative coding centered on core research dimensions. These components collectively offer methodological support for the subsequent presentation of research findings and theoretical construction.

3.1. Search strategy and literature screening procedure

This study employs a systematic review methodology, integrating bibliometric analysis, and a framework-based thematic categorization approach. The aim is to comprehensively map the theoretical structure and empirical evolution of risk and protective factors within the context of psychological resilience among cancer patients. To ensure the authority and multidisciplinary coverage of the literature sources, the Web of Science (WOS) Core Collection is selected as the primary database. Web of Science is among the most widely used academic citation databases globally, encompassing natural sciences, life sciences, social sciences, and the humanities, with a high level of academic impact and rigorous data quality control mechanisms [54].

Four main reasons justify the selection of the WOS database. First, its extensive multidisciplinary coverage enables the inclusion of relevant interdisciplinary literature across medicine, psychology, sociology, and other fields related to psychological resilience. Second, WOS enforces a strict journal selection process, ensuring that all included publications are peer-reviewed and of high scholarly quality, thereby enhancing the reliability and academic credibility of the data. Third, WOS provides powerful retrieval and analysis tools, such as Boolean search logic, field-specific queries, and citation tracking, which are well-suited for constructing complex search strategies and conducting in-depth citation network analyses. Finally, WOS offers robust visualization and analytical functions, facilitating bibliometric statistics and trend identification in subsequent stages [55].

Upon confirming the data source, literature retrieval was carried out using the WOS database. The search strategy involved the combination of keywords with Boolean operators to ensure the identification of key literature related to psychological resilience in cancer patients. The specific steps were as follows:

- 1) Keyword sample: The study focused on the following core concepts: “psychological resilience”, “mental resilience”, “emotional resilience”, “cancer”, “oncology patients”, “cancer survivors”, “risk factor”, “protective factor”, “coping”, “social support”, and “self-efficacy”.

- 2) Logical operators: A Boolean logic search expression was constructed as follows:

TITLE-ABS-KEY(("psychological resilience" OR "resilience" OR "mental resilience") AND ("cancer patients" OR "oncology patients" OR "cancer survivors") AND ("risk factor*" OR "protective factor*" OR "biomedical factor*" OR "psychosocial factor*" OR "cultural factor*"))

- 3) Inclusion criteria:

- Article type: Peer-reviewed journal articles only;
- Language: English;
- Publication status: Final publication stage;
- Time frame: January 2000 to March 2025, to capture the long-term evolution in this field.

The literature search was completed on 23 April 2025, resulting in an initial dataset of 104 articles. This systematic, rigorous, and transparent retrieval strategy laid a solid foundation for the subsequent processes of the literature screening, bibliometric analysis, and thematic classification.

Following retrieval, the research team manually reviewed each article based on predefined inclusion and exclusion criteria to ensure high relevance to the research objectives. The inclusion criteria were as follows:

- 1) The study population comprised cancer patients, including various cancer types and stages (e.g., active treatment, recovery phase);
- 2) The study clearly focused on psychological resilience, analyzing associated risk and protective mechanisms;
- 3) The study design could be quantitative, qualitative, or mixed-method, but must be original research or a systematic review;
- 4) Articles must be peer-reviewed, published in English, and indexed in international academic journals.

Exclusion criteria included:

- 1) Non-cancer populations or studies unrelated to psychological resilience;
- 2) Conference papers, book chapters, dissertations, or commentaries not peer-reviewed;
- 3) Studies lacking clear methodological descriptions, incomplete data, or unavailable full texts.

After applying these criteria, a total of 60 articles were finally included for analysis. These publications serve as the core research material for subsequent bibliometric evaluation and qualitative thematic classification. The entire screening process adheres to the PRISMA 2020 guidelines (Preferred Reporting Items for Systematic Reviews and Meta-Analyses), and the specific steps and results of the screening are detailed in the flowchart presented in **Figure 1**, enhancing both methodological transparency and rigor [56]. In addition, two independent reviewers conducted the literature screening and thematic coding to ensure methodological rigor. Discrepancies were resolved through discussion, and inter-coder reliability was calculated using Cohen's $\kappa = 0.82$, indicating substantial agreement between coders. Although the Web of Science (Core Collection, WOS) was chosen for its multidisciplinary coverage and data quality, future studies may incorporate additional databases such as PsycINFO or Scopus to enhance comprehensiveness.

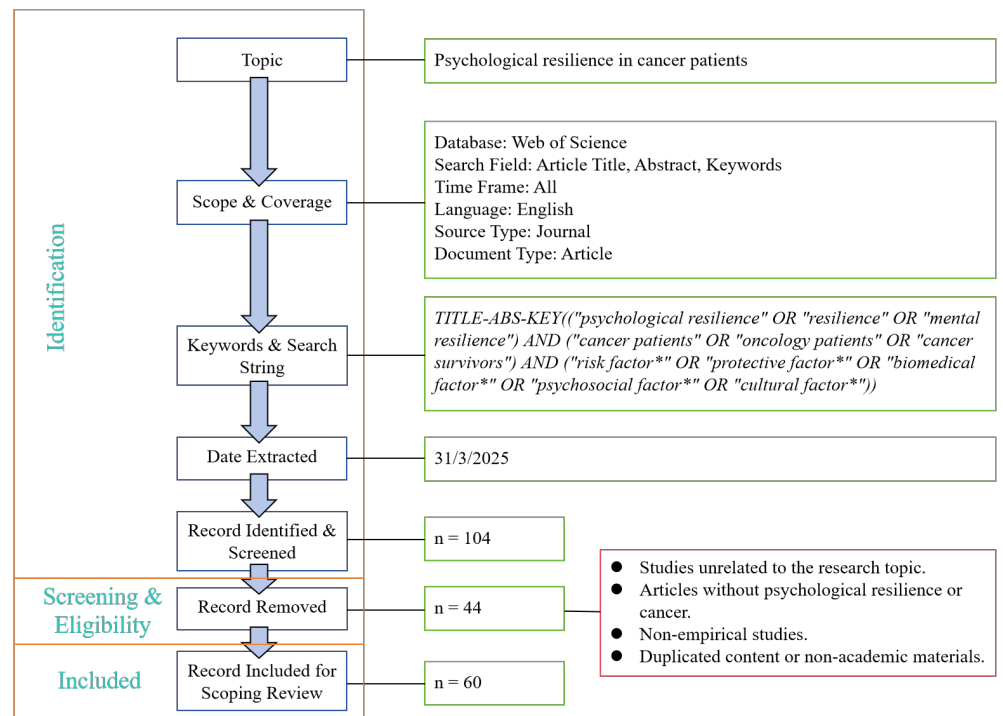


Figure 1. PRISMA-based document screening process.

3.2. Bibliometric analysis procedure

To elucidate the evolutionary trends, academic impact, and thematic structural characteristics of research on psychological resilience among cancer patients, this study adopts a bibliometric analysis approach. Bibliometric methods are instrumental not only in objectively identifying research hotspots and emerging frontiers but also in tracing the developmental trajectory of knowledge structures. The primary analytical tool employed is Bibliometrix, an open-source R package for bibliometric analysis. Bibliometrix supports a variety of scientometric techniques and enables the automated execution of tasks such as data importation, statistical analysis, graphical visualization, and thematic clustering. Compared with traditional tools, Bibliometrix offers enhanced flexibility and reproducibility, making it particularly well-suited for processing large-scale datasets derived from the Web of Science database [57].

The bibliometric analysis in this study comprises several components:

First, Citation Metrics are used to assess academic influence through indicators such as total citations, average citations per article, and the *H*-index. These metrics facilitate the identification of seminal literature and highly influential authors within the field of psychological resilience, thereby providing a quantitative evaluation of their scholarly impact and dissemination.

Second, subject area analysis is conducted to examine the disciplinary distribution of the included literature. This analysis reveals the interdisciplinary nature of psychological resilience research and highlights its integrative presence across fields such as medicine, psychology, nursing, and the social sciences.

Next, two temporal analyses—Publications by Year and Total Publications and Citations by Year—are employed to visualize annual publishing trends and the longitudinal evolution of both publication volume and citation frequency. These indicators

help assess the developmental momentum and research intensity of the field, offering empirical insights into whether the domain is in a growth, plateau, or maturity phase.

In addition, the study identifies the top 30 highly cited articles. By analyzing these key publications in terms of research subjects, methodologies, theoretical frameworks, and findings, the study outlines the foundational achievements and core theoretical underpinnings in the domain of psychological resilience. Citation networks and co-authorship maps are further generated to uncover the structural features of core author groups and collaborative research networks.

Lastly, to explore cutting-edge trends and potential future directions, keyword data from the included literature is extracted. Using the “thematic evolution” and “co-word analysis” modules in Bibliometrix, the study identifies emerging themes from selected documents—topics that have either gradually formed or are currently gaining prominence. This component enables the identification of dynamic patterns in the application of the risk-protective framework within resilience research and uncovers underexplored or emergent areas deserving further inquiry.

In summary, the multidimensional bibliometric analysis conducted via Bibliometrix provides systematic support for the subsequent qualitative thematic categorization and multilevel factor modeling. It also enhances the macro-level perspective and theoretical depth of this research.

3.3. Thematic categorization and qualitative coding methods

Building upon the results of the bibliometric analysis, this study further incorporates qualitative analysis techniques to conduct thematic categorization and coding of the 60 core articles included. The aim is to systematically explore key variables, theoretical structures, and interaction patterns within research on psychological resilience in cancer patients, guided by a risk-protective dual framework. This stage adopts a structured yet flexible approach, primarily utilizing the Framework Analysis method and employing NVivo, a computer-assisted qualitative data analysis software (CAQ-DAS), to support the coding process.

First, in terms of thematic categorization strategy, the study defines “risk factors” and “protective factors” as first-order classification dimensions. These are further subdivided based on biomedical, psychosocial, and cultural elements contributing to sources of risk. With regard to risk factors, the analysis focuses on physiological challenges such as pain severity, treatment side effects, cancer progression, and functional impairment, as well as psychosocial stressors including social exclusion, cancer-related stigma, and ineffective coping strategies. In contrast, protective factors are classified across three hierarchical levels—individual, familial, and community. At the individual level, attention is given to self-efficacy and intrinsic resilience mechanisms; at the family level, factors such as close attachment and functional family dynamics are emphasized; and at the community level, social support networks and participation in cancer support organizations are highlighted. This layered thematic taxonomy helps delineate the role of each factor within the structure of psychological resilience and offers a theoretical basis for constructing future intervention models.

Second, with regard to coding methodology, a hybrid strategy combining manual and software-assisted coding is employed. Two researchers initially develop

a preliminary coding framework based on the prior literature review and research questions. This includes primary nodes (e.g., risk factors, protective factors); secondary nodes (e.g., pain intensity, self-efficacy); and tertiary nodes (e.g., biomedical side effects, positive emotional regulation). Subsequently, the selected literature is imported into NVivo 14 for analysis. Through the software's open coding and axial coding functions, the systematicity and consistency of theme extraction are significantly enhanced [58]. During the coding process, the research team conducts regular comparisons and discussions to improve the reliability and validity of the qualitative analysis.

Finally, based on the synthesis of thematic relationships, the study constructs a "Risk Dimension $\times$ Protective Hierarchy" cross-matrix, which clearly maps the multi-level protective mechanisms corresponding to each risk factor. The matrix also annotates the observed relational patterns in the existing literature, such as positive associations, mediating effects, and buffering mechanisms. This matrix model not only illuminates the dynamic interaction mechanisms underpinning the formation of psychological resilience but also provides theoretical guidance and empirical reference for the design of future intervention strategies and individualized treatment pathways.

In conclusion, this study supplements the bibliometric analysis with a systematic qualitative classification process. Through rigorous thematic annotation, coding, and relationship modeling, it aims to comprehensively present the structural characteristics and critical pathways of the risk-protective mechanisms within the field of psychological resilience research among cancer patients.

4. Results

This chapter will systematically present the results of the bibliometric analysis and qualitative thematic induction of this study. The bibliometrix tool was used to conduct quantitative and content analysis of 60 core documents, and combined with framework-based thematic classification and cross-matrix construction, the structural characteristics, key variable distribution and development path of the research on psychological resilience of cancer patients were extracted.

4.1. Formatting of mathematical components

Table 1 shows the main quantitative information of the literature on psychological resilience of cancer patients included in this study.

According to the data in **Table 1**, in the 17 years from 2009 to 2025, the research included a total of 60 core documents, involving 354 authors, and was cited 1079 times in total. On average, each document was cited 17.98 times, and each author contributed an average of about 3.05 citations. The proportion of cited documents reached 91.67% (55 articles), indicating that the research group as a whole has good academic influence and dissemination.

The *h*-index is 17, indicating that at least 17 documents have been cited more than 17 times; the *g*-index is 31, indicating that the citations are highly concentrated in some core documents; the *m*-index is 1.06, reflecting that this research field generates a high-impact core research every year and is in a steady development stage.

Table 1. Citation metrics of the included studies.

Main information	Data
Publication years	2009–2025
Total publications	60
Citable year	17
Number of contributing authors	354
Number of cited papers	55
Total citations	1079
Citation per paper	17.98
Citation per cited paper	19.62
Citation per year	63.47
Citation per author	3.05
Author per paper	5.90
Citation sum within <i>h</i> -core	836
<i>h</i> -index	17
<i>g</i> -index	31
<i>m</i> -index	1.06

Overall, this research topic has a strong academic attention and active citation, and the contribution of high-quality documents is significant, reflecting the concentration and professionalization of the research.

4.2. Discipline distribution characteristics

Next, **Table 2** summarizes the main subject areas and their distribution covered by the sample literature of this study.

Table 2. Subject area distribution.

Subject area	Total publications	Percentage (%)
Psycho-oncology	20	33.33%
Oncology nursing	12	20.00%
Health psychology	7	11.67%
Cancer survivorship	4	6.67%
Public health/Women's health	2	3.33%
Pediatric psycho-oncology	3	5.00%
Geriatric oncology	2	3.33%
Psychosocial oncology	3	5.00%
Nursing/Psychosocial oncology	2	3.33%
Behavioral medicine	1	1.67%
Indigenous health/Oncology	2	1.67%
Occupational health	1	1.67%
Supportive care	1	1.67%

As shown in **Table 2**, the distribution of research papers shows that resilience research has obvious interdisciplinary characteristics. The literature is mainly concentrated in psycho-oncology (33.33%), oncology nursing (20.00%), and health psychology (11.67%). In addition, emerging fields such as pediatric oncology, public health, indigenous health, and occupational psychology have also begun to pay attention to the psychological recovery of cancer patients.

This distribution shows that resilience has become an important topic of multidisciplinary intersection in cancer research. It spans multiple subsystems such as

treatment, rehabilitation, care and community psychological intervention, laying a theoretical foundation for building an integrated “physiological-psychological-social” care path.

4.3. Publication trends

Table 3 presents the publication trends, citation performance, and academic influence indicators of literature in the field of psychological resilience of cancer patients from 2009 to 2025, aiming to reveal the development context and influence evolution of psychological resilience in cancer patient research.

As shown in **Table 3**, during the initial research period (2009–2015), the annual number of publications remained relatively low; however, the citation density was

Table 3. Annual publication and citation trends (2009–2025).

Year	TP	NCA	NCP	TC	C/P	C/CP	<i>h</i>	<i>g</i>	<i>m</i>
2009	1	2	1	35	35.00	35.00	1	1	0.06
2013	2	12	2	186	93.00	93.00	2	2	0.17
2014	1	3	1	71	71.00	71.00	1	1	0.09
2015	2	13	2	84	42.00	42.00	2	2	0.20
2016	2	12	2	68	34.00	34.00	2	2	0.22
2017	1	4	1	72	72.00	72.00	4	1	0.50
2018	4	29	4	113	28.25	28.25	4	4	0.57
2019	6	36	6	135	22.50	22.50	5	6	0.83
2020	4	18	4	110	27.50	27.50	4	4	0.80
2021	6	29	6	57	9.50	9.50	4	6	1.00
2022	6	40	6	49	8.17	8.17	4	6	1.33
2023	12	66	11	74	6.17	6.73	5	8	2.50
2024	10	75	8	24	2.40	3.00	3	4	3.00
2025	3	15	1	1	0.33	1.00	1	1	0

Note: TP: total number of publications; NCA: number of contributing authors; NCP: number of cited publications; TC: total citations; C/P: average citations per publication; C/CP: average citations per cited publication; *h*: *h*-index; *g*: *g*-index; *m*: *m*-index.

high, with several representative and influential works emerging during this stage. Since 2018, there has been a marked increase in annual publication output, reaching its peak in 2023 with 12 articles published, indicating that research on psychological resilience in the context of cancer has entered a phase of rapid development. Although the average annual citation rate has shown a slight decline since 2021, this is primarily attributable to the shorter time since publication, which has not yet allowed for substantial citation accumulation. Nevertheless, a high *m*-index suggests that the overall scholarly impact of the field continues to exhibit an upward trajectory.

In terms of citation performance—including total citations (TC), citations per publication (C/P), and citations per cited publication (C/CP)—the most influential studies in psychological resilience research are concentrated between 2013 and 2018. For instance, two publications from 2013 garnered a total of 186 citations, averaging 93 citations per paper (C/P = 93.00), marking it as the year with the highest citation density. Publications from 2014 and 2017 also received 71 and 72 citations, respectively, underscoring the enduring academic relevance of these early high-quality contributions. While the number of publications increased between 2018 and 2020, the average

citation rate (C/P) showed a moderate decline, though it remained above 20, suggesting a relatively high level of academic recognition despite ongoing citation accumulation.

In contrast, articles published after 2021 have demonstrated comparatively lower citation rates. Specifically, the C/P values for the years 2021–2023 declined to between 6 and 9, and dropped further to 2.4 in 2024. This reflects a typical “citation time-lag” effect, wherein newly published research has not yet had sufficient time to diffuse and be cited widely. Thus, although the quantity of research has increased significantly in recent years, its scholarly impact still requires time for consolidation and dissemination.

To further illustrate the annual publication trends and citation impact revealed in **Table 3**, **Figure 2** provides a visual representation of the total number of publications and corresponding total citations from 2009 to 2025. In the figure, orange bars denote the annual publication counts, while the green line indicates the total citations received in each corresponding year. This visual aid facilitates a clearer understanding of the dynamics of academic output and the evolution of scholarly influence within the field of psychological resilience in cancer patients. It particularly highlights the synergistic trend between increasing publication activity and citation growth since 2018, as well as the citation time-lag effect observable in more recent years.

As illustrated in the figure, the field has entered a period of rapid growth since 2018, with a significant increase in the number of publications. Notably, the liter-

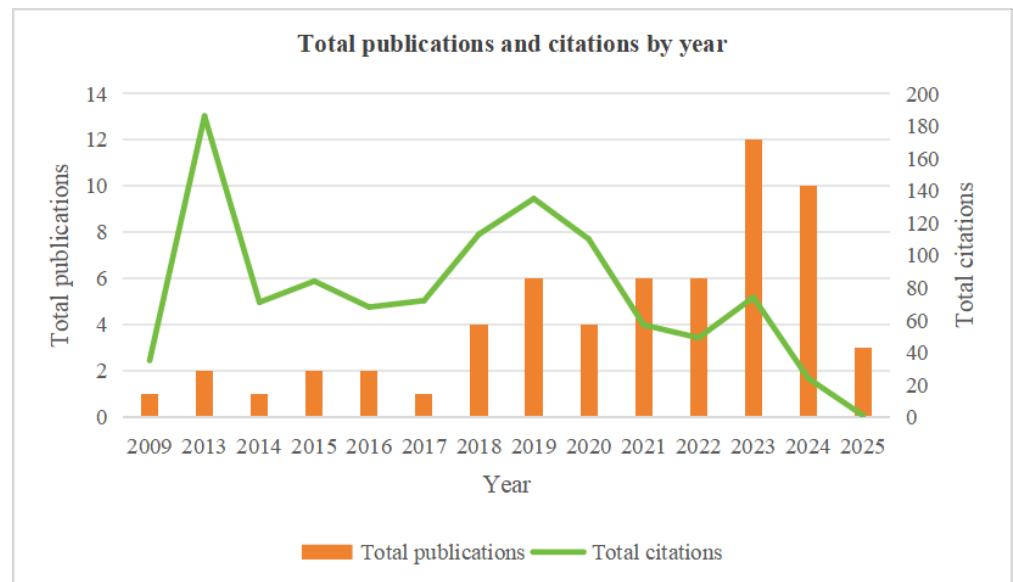


Figure 2. Total publications and citations by year.

ature published between 2013 and 2017 demonstrates outstanding citation performance, indicating the substantial academic impact of early contributions. In contrast, although the number of recent publications has grown, their citation counts remain relatively low, reflecting a typical citation accumulation lag phenomenon.

Taken together, the publication trajectory of psychological resilience research in cancer patients reveals a clear progression from an emergent phase to a period of accelerated development. Early-stage literature stands out in terms of quality and academic influence, while the recent surge in publication volume still requires

time for scholarly diffusion and recognition. With the continued advancement of interdisciplinary integration, precision nursing, and mental health interventions, this research topic is expected to generate increasingly high-quality outputs in the coming years, potentially exerting a more profound impact on clinical practice and policy development.

4.4. Highly cited literature and impact analysis

To gain an in-depth understanding of the core literature with significant influence in the field of psychological resilience and cancer research, **Table 4** summarizes the top 30 most cited key publications. The table includes critical metrics for each article, such as the DOI, total citations (Total Citations), average citations per year (TC per Year), and normalized citation counts (Normalized TC). These data facilitate the identification of seminal academic contributions from a citation perspective

Table 4. Thirty most-cited publications.

No.	Paper	DOI	Total citations	TC per year	Normalized TC
1	Min JA, 2013, Support Care Cancer	10.1007/s00520-013-1807-6	150	11.54	1.61
2	Harms CA, 2019, Psycho-Oncol	10.1002/pon.4934	82	11.71	3.64
3	Rosenberg AR, 2015, Cancer	10.1002/cncr.29651	80	7.27	1.9
4	Dooley LN, 2017, Stress Health	10.1002/smi.2739	72	8	1
5	Cohen M, 2014, J Geriatr Oncol	10.1016/j.jgo.2013.07.009	71	5.92	1
6	Aizpurua-Perez I, 2020, Eur J Oncol Nurs	10.1016/j.ejon.2020.101854	56	9.33	2.04
7	Ye ZJ, 2018, Eur J Oncol Nurs	10.1016/j.ejon.2018.08.001	44	5.5	1.56
8	Yang YL, 2016, PLOS One	10.1371/journal.pone.0155607	44	4.4	1.29
9	Zou G, 2018, J Clin Nurs	10.1111/jocn.14245	41	5.13	1.45
10	Teall T, 2013, Pediatr Blood Cancer	10.1002/pbc.24441	36	2.77	0.39
11	Chou LN, 2009, J Adv Nurs	10.1111/j.1365-2648.2009.05078.x	35	2.06	1
12	Duan-Porter W, 2016, J Geriatr Oncol	10.1016/j.jgo.2016.07.009	24	2.4	0.71
13	Guil R, 2020, Front Psychol	10.3389/fpsyg.2020.595713	23	3.83	0.84
14	Shao M, 2023, Eur J Oncol Nurs	10.1016/j.ejon.2023.102403	21	7	3.41
15	Palacio C, 2020, Support Care Cancer	10.1007/s00520-019-05139-8	21	3.5	0.76
16	Li X, 2021, Support Care Cancer	10.1007/s00520-020-05633-4	18	3.6	1.89
17	Lee JL, 2019, Cancer Nurs	10.1097/NCC.0000000000000645	18	2.57	0.8
18	Seol KH, 2021, Psychiatry Investig	10.30773/pi.2020.0286	16	3.2	1.68
19	Zhang T, 2018, Contemp Nurse	10.1080/10376178.2018.1502615	16	2	0.57
20	Macia P, 2022, J Health Psychol	10.1177/1359105320946358	15	3.75	1.84
21	Chien CH, 2022, Eur J Cancer Care	10.1111/ecc.13759	13	3.25	1.59
22	Martin A, 2019, Gerontologist	10.1093/geront/gnz039	13	1.86	0.58
23	Tao L, 2023, J Clin Nurs	10.1111/jocn.16321	13	4.33	2.11
24	Palacio Gonzale Z C, 2021, Eur J Cancer Care	10.1111/ecc.13346	12	2.4	1.26
25	Maatouk I, 2018, BMJ Open	10.1136/bmjopen-2017-021376	12	1.5	0.42
26	Roh S, 2019, Women Health	10.1080/03630242.2018.1544965	11	1.57	0.49
27	Bea JW, 2020, J Cancer Educ	10.1007/s13187-019-01487-5	10	1.67	0.36
28	Hinz A, 2023, Int J Clin Health Psychol	10.1016/j.ijchp.2022.100358	10	3.33	1.62
29	Oppgaard K, 2022, Eur J Oncol Nurs	10.1016/j.ejon.2021.102031	9	2.25	1.1
30	Jiang X, 2019, J Adv Nurs	10.1111/jan.14108	8	1.14	0.36

and enable further analysis of their research focus, dissemination efficiency, and sustained impact within the discipline.

Among them, Min et al. [7], Harms et al. [74], and Rosenberg et al. [91] ranked first in citations, focusing on emotional distress, protective resources, and long-term adaptability, respectively, forming the theoretical foundation of this field.

The topics of highly cited literature are mainly concentrated on: psychological distress regulation mechanism, social support and emotion regulation strategy, structural model construction, scale development, and validation, etc. Although the total citations of recent literature (such as Shao et al. [62]) are relatively low, the average annual citation growth is fast, indicating that “the influence of emerging literature is taking shape.” These studies constitute the “knowledge core” in the knowledge structure, and also indicate that intervention paths, cultural differences, and life cycle perspectives will become the growth points of subsequent research.

4.5. Emerging themes and research focus

Table 5 comprehensively sorts out and categorizes the 60 articles included in this study, covering their research purpose, design methods, fields, and keyword themes. Through the systematic analysis of these articles, the main topic structure and evolution trend of current research on psychological resilience of cancer patients can be more clearly depicted.

From the perspective of research content, the emerging themes can be broadly categorized into five core directions: First, the most prevalent focus centers on

Table 5. Emerging research themes.

No.	Authors & year	Title	Aim/Purpose	Study design	Field of study
1	Shim et al. (2022) [59]	Psychiatric comorbidities and quality of life in breast cancer patients undergoing radiation treatment: Risk and protective factors	To evaluate psychiatric comorbidities in breast cancer patients undergoing radiotherapy and identify associated risk and protective factors.	Observational longitudinal study	Psycho-Oncology
2	Roh et al. (2019) [22]	Identifying risk and protective factors related to depressive symptoms among Northern Plains American Indian women cancer survivors	To examine how ACEs, perceived health, resilience, and social support relate to depressive symptoms in AI women cancer survivors.	Cross-sectional regression study	Public Health/ Women’s Health
3	Dong et al. (2025) [60]	Psychosocial factors promoting resilience in breast cancer survivors: A qualitative study	To explore psychological and social resources that promote resilience in Chinese breast cancer survivors through semi-structured interviews.	Qualitative interview study	Psycho-Social Oncology
4	Chou and Hunter (2009) [37]	Factors affecting quality of life in Taiwanese survivors of childhood Cancer	To examine the relationship between risk/protective factors, resilience, and quality of life in childhood cancer survivors in Taiwan.	Mixed-methods (quant + interview)	Pediatric Psycho-oncology
5	Ye et al. (2018) [61]	A biopsychosocial model of resilience for breast cancer: A preliminary study in mainland China	To develop and validate a structural model (RM-BC) identifying biopsychosocial risk and protective factors for resilience in breast cancer patients.	Structural equation modeling	Oncology Nursing

Table 5. (Continued).

No.	Authors & year	Title	Aim/Purpose	Study design	Field of study
6	Shao et al. (2023) [62]	Family resilience in cancer treatment and key influencing factors: A systematic review	To systematically review the influencing factors (risk/protective) of family resilience among cancer patients and caregivers.	Systematic review	Oncology Nursing
7	Min et al. (2013) [7]	Psychological resilience contributes to low emotional distress in cancer patients	To assess the role of psychological resilience in reducing emotional distress in hospitalized cancer patients.	Quantitative observational study	Psycho-oncology
8	Li et al. (2021) [63]	Resilience process and its protective factors in long-term survivors after lung cancer surgery: A qualitative study	To explore the stages and protective resources involved in the resilience process of long-term lung cancer survivors.	Qualitative (phenomenological)	Oncology Nursing
9	Singer and Carpenter (2023) [39]	Trajectories of cancer-specific stress in cancer patients: A latent growth mixture analysis	To identify patterns of cancer-related stress and their psychosocial predictors using longitudinal growth modeling.	Longitudinal (latent class model)	Health Psychology
10	Silvaggi et al. (2023) [64]	Psychosocial factors associated with workability after surgery in cancer survivors: An explorative study	To examine changes in work ability and associated psychosocial factors (resilience, support, fatigue) in glioma and breast cancer patients post-surgery.	Longitudinal correlational study	Psycho-oncology/ Work Health
11	Jiang et al. (2019) [65]	An intervention based on protective factors to improve resilience for breast cancer patients	To evaluate the feasibility and effectiveness of a protective-factor-based intervention to enhance resilience among breast cancer patients.	Randomized controlled trial	Nursing/ Psychosocial Oncology
12	Ma et al. (2025) [66]	Individualized symptom experience and predictors in cancer patients after oesophagectomy: A latent profile analysis	To identify symptom profiles and explore risk factors (e.g., resilience, staging) associated with different symptom experiences post-surgery.	Cross-sectional/ LPA	Oncology Nursing
13	Macia et al. (2022) [67]	Role of resilience and emotional control in relation to mental health in people with cancer	To explore how resilience and emotional control influence mental health outcomes in cancer patients.	Quantitative correlational study	Health Psychology
14	Fortune et al. (2023) [23]	Perceived COVID-19 pandemic impact and protective factors predicting depression and anxiety in individuals with cancer	To examine the influence of COVID-19 stressors and protective factors (resilience, hope) on depression and anxiety in cancer patients.	Cross-sectional (hierarchical regression)	Patient-reported Outcomes
15	Brajkovic et al. (2023) [27]	Subjective well-being in cancer patients: the roles of social support, purpose in life, resilience, and informativeness	To investigate how various psychosocial factors (resilience, social support, meaning) predict subjective well-being in cancer patients.	Quantitative survey study	Health Psychology
16	Telles et al. (2024) [50]	Well-being and stress vulnerability in ovarian cancer survivors during the COVID-19 pandemic	To assess the relationship between baseline resources and well-being/stress vulnerability among ovarian cancer survivors during the pandemic.	Observational cohort study	Psychosocial Oncology
17	Guil et al. (2020) [68]	Breast cancer and resilience: The controversial role of perceived emotional intelligence	To examine how different dimensions of perceived emotional intelligence (PEI) act as protective or risk factors in breast cancer resilience.	Quantitative, mediation analysis	Positive Psychology/ Oncology
18	Ruishu et al. (2024) [21]	Systematic literature review of qualitative research on stress resilience among breast cancer survivors	To synthesize qualitative findings regarding resilience processes and coping strategies in breast cancer survivors.	Systematic review (qualitative)	Psychosocial Oncology
19	Aizpurua-Perez & Perez-Tejada (2020) [69]	Resilience in women with breast cancer: A systematic review	To identify biopsychosocial factors influencing resilience and effective interventions in breast cancer patients.	Systematic Review	Oncology Nursing

Table 5. (Continued).

No.	Authors & year	Title	Aim/Purpose	Study design	Field of study
20	Chien et al. (2022) [47]	Exploring psychological resilience and demoralisation in prostate cancer survivors	To investigate predictors and mediators of resilience and demoralization in prostate cancer survivors.	Cross-sectional study	Health Psychology/Oncology
21	Uzar-Ozcetin and Kovanci (2022) [70]	“For years i lived in a cage. Now the cage is open and i am just learning to fly.” Perspectives of cancer survivors on psychological resilience	To explore how cancer survivors experience psychological resilience and identify related themes during survivorship.	Qualitative (descriptive design)	Oncology Nursing
22	Martin et al. (2019) [71]	Attitude toward own aging among older adults: Implications for cancer prevention	To examine the relationship between attitude toward own aging (ATOA) and health outcomes in older adults with and without cancer.	Quantitative, regression analysis	Geriatric Mental Health
23	Yang et al. (2016) [24]	Psychological disorders and psychosocial resources of patients with newly diagnosed bladder and kidney cancer	To assess prevalence of depression, anxiety, PTSD, and the role of psychosocial resources in newly diagnosed bladder/kidney cancer.	Cross-sectional	Psycho-oncology
24	Wang et al. (2024) [72]	A latent profile analysis of psychological resilience in gastric cancer survivors	To identify distinct profiles of resilience in gastric cancer survivors and analyze influencing factors using Kumpfer’s framework.	Latent Profile Analysis (LPA)	Oncology Nursing
25	Zou et al. (2018) [73]	Resilience and positive affect contribute to lower cancer-related fatigue among Chinese patients with gastric cancer	To examine how resilience and positive affect relate to cancer-related fatigue in gastric cancer patients.	Cross-sectional, mediation analysis	Clinical Nursing
26	Wang et al. (2023) [30]	The relationship between patient-family caregiver congruence/incongruence in acceptance of illness and family caregivers’ anticipatory grief	To explore how illness acceptance congruence between patients and caregivers affects caregivers’ anticipatory grief, and whether resilience moderates this effect.	Dyadic analysis, polynomial regression	Psycho-oncology/Family Psychology
27	Harms et al. (2019) [74]	Quality of life and psychological distress in cancer survivors: The role of psycho-social resources for resilience	To evaluate the predictive validity of the Protective Factors for Resilience Scale (PFRS) for quality of life and distress in cancer survivors.	Cross-sectional survey	Psycho-oncology
28	Teall et al. (2013) [34]	Psychological resilience in adolescent and young adult survivors of lower extremity bone tumors	To examine perceived social support, benefit finding, and psychological resilience among young survivors of bone cancer.	Cross-sectional	Pediatric Psycho-oncology
29	Edward et al. (2019) [75]	Recovery in early stage breast cancer – an Australian longitudinal study	To investigate the psychosocial adjustment and body image recovery among women with early-stage breast cancer over a 12-month period.	Longitudinal cohort study	Oncology Nursing
30	Castellano-Tejedor et al. (2015) [76]	Social support during childhood cancer treatment enhances quality of life at survival	To assess the impact of emotional and social support during treatment on later quality of life among pediatric cancer survivors.	Cross-sectional (retrospective recall)	Pediatric Psychology
31	Colliva et al. (2024) [77]	Exploring sex-based neuropsychological outcomes in pediatric brain cancer survivors	To examine sex differences in neuropsychological outcomes and resilience among pediatric brain cancer survivors treated with chemotherapy.	Pilot quantitative study	Pediatric Neuro-oncology
32	Palacio and Limonero (2020) [78]	The relationship between the positive aspects of caring and the personal growth of caregivers	To examine how positive aspects of caregiving, resilience, and spirituality affect posttraumatic growth among caregivers of advanced cancer patients.	Cross-sectional, correlational	Psycho-oncology/Caregiving

Table 5. (Continued).

No.	Authors & year	Title	Aim/Purpose	Study design	Field of study
33	Wang et al. (2023) [30]	The relationship between positive aspects of caring, anxiety, and depression in caregivers	To investigate whether caregiving burden mediates the relationship between positive aspects of care and caregiver mental health.	Cross-sectional, SEM modeling	Psycho-oncology/ Caregiving
34	Khok et al. (2024) [35]	Journey toward resiliency: A systematic review and meta-synthesis of cancer patients' experiences	To synthesize qualitative evidence on the resilience-building journey of cancer patients and identify protective factors.	Systematic review & meta-synthesis	Oncology Nursing
35	Duan-Porter et al. (2016) [79]	Physical resilience of older cancer survivors: An emerging concept	To define and measure physical resilience among older cancer survivors and explore associated psychosocial predictors.	Secondary analysis, RCT cohort study	Geriatric Oncology
36	Yang et al. (2024) [80]	The links between symptom burden, illness perception, psychological resilience, social support, coping modes, and cancer-related worry in Chinese early-stage lung cancer patients after surgery	To explore the relationships between psychosocial factors and cancer-related worry in early-stage lung cancer survivors after surgery.	Cross-sectional study	Psycho-oncology/ Lung Cancer
37	Xu et al. (2021) [81]	A review of the prevalence, associated factors and interventions of psychological symptoms among cancer patients in the Chinese Mainland during the COVID-19 pandemic	To review the psychological symptoms among cancer patients in China during the COVID-19 pandemic, and evaluate the related interventions.	Systematic review	Oncology/Psycho-oncology
38	Maatouk et al. (2018) [82]	Association of resilience with health-related quality of life and depression in multiple myeloma and its precursors	To examine the role of resilience in quality of life and depression among multiple myeloma patients and its precursors.	Cross-sectional study	Hematology/ Psycho-oncology
39	Vanrusselt et al. (2023) [32]	Associations between cancer-related distress and fatigue in childhood cancer survivors: A longitudinal study	To analyze how cancer-related distress and resilience impact fatigue in childhood cancer survivors over time.	Longitudinal study	Pediatric Oncology
40	Li et al. (2024) [83]	Correlates of death anxiety for patients with cancer: A systematic review and meta-analysis	To identify factors associated with death anxiety in cancer patients, and inform the design of interventions.	Systematic review & meta-analysis	Oncology/Psycho-oncology
41	Tao et al. (2023) [36]	Effects of family beliefs and family strength on individual resilience and quality of life among young breast cancer survivors	To examine how family beliefs and strength influence resilience and QoL in young breast cancer survivors, and whether family strength mediates these effects.	Cross-sectional study (STROBE guideline)	Nursing/Psycho-oncology
42	Burnette et al. (2021) [84]	American Indian women cancer survivors' perceptions and experiences with conventional and non-conventional mental health care for depressive symptoms	To explore help-seeking practices for depression among AI/AN women cancer survivors, including barriers to conventional mental health services.	Qualitative descriptive study (content analysis)	Public Health/ Minority Health
43	Fritzson et al. (2024) [31]	Effects of resilience and emotion regulation on perceptions of positive and negative life changes in cancer survivors	To longitudinally assess how resilience and emotion regulation influence perceived life changes after cancer diagnosis.	Prospective cohort study (6-month follow-up)	Behavioral Medicine
44	Calvo-Schimmel et al. (2024) [40]	Various types of stress and greater use of disengagement coping are associated with worse sleep disturbance in oncology patients undergoing chemotherapy	To evaluate associations between stress types, coping strategies, and sleep disturbance during chemotherapy.	Multicenter longitudinal observational study	Oncology Nursing
45	Schechter-Finkelstein et al. (2021) [85]	Pediatric hematology/oncology healthcare professional emotional health during COVID-19	To characterize anxiety, depression, and stress levels among pediatric oncology HCPs after COVID-19 exposure.	Cross-sectional survey	Occupational Health

Table 5. (Continued).

No.	Authors & year	Title	Aim/Purpose	Study design	Field of study
46	Chen et al. (2024) [41]	Increased stress is associated with severe pain and decrements in cognitive function in patients receiving chemotherapy	To identify subgroups of chemotherapy patients with distinct pain-cognitive function profiles and evaluate stress/resilience differences.	Longitudinal observational study (6 assessments over 2 chemo cycles)	Oncology Nursing
47	Bea et al. (2020) [43]	Perceptions of cancer causes, prevention, and treatment among Navajo cancer survivors	To understand Navajo cancer survivors' perspectives on cancer etiology, care barriers, and cultural resilience factors.	Qualitative study (focus groups & interviews)	Indigenous Health/Oncology
48	Snyder et al. (2022) [86]	Moderators of the association between stigma and psychological and cancer-related symptoms in women with non-small cell lung cancer	To examine whether mindfulness buffers the impact of lung cancer stigma on psychological/cancer-related symptoms.	Cross-sectional study	Psycho-oncology
49	Seol et al. (2021) [87]	Factors associated with the quality of life of patients with cancer undergoing radiotherapy	To identify time-varying psychosocial factors influencing QoL during radiotherapy.	Prospective cohort (baseline, post-RT, 3mo follow-up)	Radiation Oncology
50	Liu et al. (2023) [48]	Factors related to the quality of life of family cancer caregivers	To assess caregiver QoL and identify protective/risk factors in Chinese oncology settings.	Cross-sectional survey	Supportive Care
51	Oppegaard et al. (2022) [88]	Higher stress and symptom severity are associated with worse depressive symptom profiles in patients receiving chemotherapy	To identify subgroups of patients with distinct depressive symptom profiles and evaluate differences in demographic and clinical characteristics, levels of stress and resilience, and the severity of co-occurring symptoms.	Latent profile analysis (LPA)	Oncology Nursing
52	Walton et al. (2023) [89]	Lived experience of adult female cancer survivors to discover common protective resilience factors to cope with cancer experience and to identify potential barriers to resilience	To identify common protective resilience factors and potential barriers to resilience for adult female cancer survivors.	Mixed approach using sequential exploratory design	Health Care Sciences & Services
53	Hun Kwak et al. (2023) [90]	Risk factors for a higher symptom burden in patients with cancer during the Covid-19 pandemic	To evaluate subgroups of patients with distinct symptom profiles and evaluate stress and resilience among these subgroups.	Latent class profile analysis	Oncology Nursing
54	Hinz et al. (2023) [46]	Sense of coherence, resilience, and habitual optimism in cancer patients	To investigate the relationship between sense of coherence, resilience, and habitual optimism in cancer patients	Cross-sectional study	Health Psychology
55	Li et al. (2025) [42]	Factors influencing parenting concerns in Chinese breast cancer mothers with minor children: A path analysis using a multi-mediation model	To examine parenting concerns in Chinese breast cancer mothers and explore factors like illness perception, social support, and family resilience.	Cross-sectional study	Psycho-oncology
56	Rosenberg et al. (2015) [91]	Resilience, health, and quality of life among long-term survivors of hematopoietic cell transplantation	To explore associations between resilience, psychological distress, and quality of life in HCT survivors.	Cross-sectional survey	Cancer Survivorship
57	Dooley et al. (2017) [92]	Strength through adversity: Moderate lifetime stress exposure is associated with psychological resilience in breast cancer survivors	To test whether moderate stress exposure promotes resilience to cancer-related psychological distress.	Observational study	Psychoneuro-immunology
58	Zhang et al. (2018) [93]	Factors promoting resilience among breast cancer patients: A qualitative study	To identify resilience factors in Chinese breast cancer patients within a cultural context.	Qualitative interviews	Nursing
59	Cohen et al. (2014) [33]	The association of resilience and age in individuals with colorectal cancer: An exploratory cross-sectional study	To assess resilience as a mediator between age and emotional distress in colorectal cancer patients.	Cross-sectional study	Geriatric Oncology
60	Lee and Jeong (2019) [94]	Quality of life in patients with non-small cell lung cancer: Structural equation modeling	To identify predictors of QOL (social support, resilience, distress, symptoms) in NSCLC patients.	Structural equation modeling	Oncology Nursing

the mechanisms of individual psychological resources, with studies concentrating on how variables such as self-efficacy, coping styles, and emotion regulation influence the formation and maintenance of resilience. Second, family support and caregiving systems have increasingly become focal points of research, particularly regarding the protective roles of family cohesion, caregiving consistency, and kinship support networks in fostering resilience. Third, a substantial body of literature emphasizes the impact of symptom burden and emotional distress on the psychological state of cancer patients, with specific attention to the regulatory roles of fatigue, depression, anxiety, and cancer-related stress within the resilience process. Fourth, there is a growing number of studies exploring cultural adaptation and the experiences of marginalized groups, including culturally sensitive interventions and localization of resources for minority ethnicities, women, children, and Indigenous patient populations. Fifth, since the outbreak of the COVID-19 pandemic, a series of investigations have shifted attention to the effects of pandemic-related stress on the psychological resilience of cancer patients, highlighting the critical importance of maintaining psychological stability and recovery during public health crises.

Methodologically, there is a clear trend from traditional quantitative research toward the integration of mixed methods. Although approximately half of the studies still employ quantitative approaches such as surveys and statistical modeling (e.g., hierarchical regression, structural equation modeling, latent class analysis), an increasing number of publications incorporate qualitative methodologies (e.g., phenomenological interviews, narrative analysis, focus groups) or utilize mixed methods combining quantitative and qualitative data. Moreover, systematic reviews and meta-syntheses have emerged as important approaches for identifying research trajectories and synthesizing theoretical models. This methodological diversity not only enhances sensitivity to individual subjective experiences and social contexts but also improves the dynamic characterization of the complex resilience process.

Regarding research populations, breast and lung cancer patients remain the most extensively studied groups, reflecting their accessibility in clinical sampling and intervention validation. However, recent years have seen growing attention to special populations, such as childhood cancer survivors, elderly oncology patients, minority women, and Indigenous groups. This trend indicates an expansion of psychological resilience research from generalizability toward specificity, with future work expected to place greater emphasis on cultural backgrounds, developmental stages, and the psychological adaptation needs of vulnerable groups. Such advances hold promise for driving the development of more precise and individualized intervention models.

In summary, the thematic and methodological characteristics presented in **Table 5** comprehensively illustrate the multidimensional composition and evolutionary trajectory of psychological resilience research within the cancer context, thereby providing a solid foundation and reference for the subsequent theoretical integration and intervention design in the present study.

4.6. Construction of the “risk-protection cross-matrix” and multidimensional pathways

This study developed a “risk-protection cross-matrix”, with biomedical, psychosocial, and cultural risk factors represented along the horizontal axis, and individual, familial, and community protective mechanisms delineated along the vertical axis. This matrix integrates resources across multiple levels to elucidate how protective factors modulate risk influences, collaboratively shaping psychological resilience, as detailed in **Table 6**.

This matrix clearly demonstrates the theoretical logic of resilience as a product of multi-system interaction, emphasizing that research and intervention should

Table 6. Risk-protection cross-matrix.

Level/type	Biomedical risks (such as pain, side effects of treatment)	Psychosocial risks (such as depression, avoidance coping)	Cultural risks (such as stigma, family role pressure)
Individual level	Self-efficacy relieves physical discomfort	Positive emotion regulation reduces anxiety	Positive identity resists stigma
Family level	Family care support improves treatment compliance	Emotional communication strengthens coping motivation	Family understanding reduces stigma pressure
Community level	Community medical resources provide continuous support	Community participation promotes emotional resonance	Public publicity improves social cognition

go beyond “individual-centrism” and evolve towards comprehensive intervention at the family and community levels. To enhance operational clarity, key variables in the matrix were defined according to their theoretical and empirical relevance. For instance, biomedical risk factors include pain intensity, treatment-related side effects, and fatigue; psychosocial risks encompass depression, social exclusion, and maladaptive coping; and cultural risks refer to perceived stigma and traditional role expectations. Correspondingly, protective mechanisms involve self-efficacy and optimism at the individual level, family cohesion and open communication at the family level, and community participation and public awareness at the community level.

4.7. Schematic model of the subject classification diagram

The literature was manually coded with the help of NVivo software, and the subject tree structure was constructed as follows. The thematic coding and hierarchical relationships were visualized through a schematic model shown in **Figure 3**.

This structure further supports the “risk-protection” analytical framework of this study, facilitating the extraction of high-frequency variables from the text, identifying interaction paths between variables, and using them to construct intervention models in future studies.

5. Discussion

Based on the dual theoretical framework of “risk-protection”, this study conducts a structured review of research on psychological resilience among cancer patients by integrating a systematic literature review and bibliometric analysis. Through the analysis of 60 core publications from 2009 to 2025, the study identifies the developmental trajectory, methodological evolution, thematic focus, and multilevel interac-

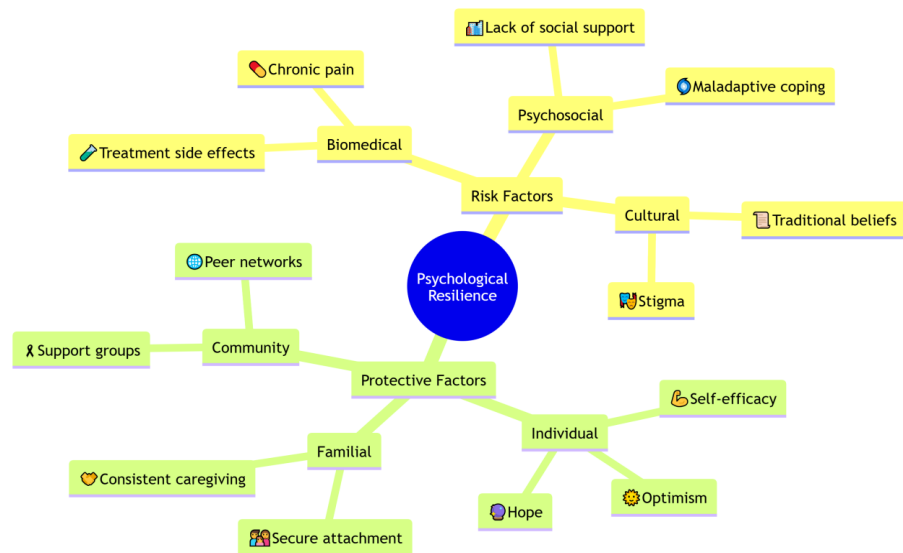


Figure 3. The resilience ecosystem map.

tion mechanisms among key variables within this domain. This chapter will address four major areas: developmental trends in the research, theoretical construction of the risk-protection framework, methodological integration and innovation, and limitations and future directions.

5.1. Evolutionary trends and developmental phases of psychological resilience research among cancer patients

Annual publication trends and the distribution of highly cited literature indicate that research on psychological resilience in cancer patients has followed a progressive path from “conceptual introduction” to “theoretical construction” and finally to “multidimensional empirical validation.” The period from 2009 to 2015 marked the initial phase, with a limited number of publications but relatively high quality, as evidenced by substantial citation counts of representative studies, which helped establish the theoretical relevance of resilience in oncology. Since 2016, as the importance of psychological well-being in cancer care has been increasingly recognized, the number of studies has grown steadily—particularly accelerating after 2018—signaling the emergence of this theme as a key research direction in psycho-oncology and cancer nursing.

Notably, although publication volume has continued to rise in recent years, articles published after 2021 generally show lower citation counts, reflecting the typical “citation delay” phenomenon. Therefore, it is inappropriate to evaluate the significance of newer publications based solely on citation frequency; instead, their scholarly value should be assessed through the lens of research content and theoretical innovation.

5.2. Empirical validation and theoretical extension of the “risk-protection” interactive framework

The “risk-protection cross-matrix” developed in this study integrates biomedical, psychosocial, and cultural risk factors with individual, familial, and community-level

protective mechanisms, thereby illustrating the systemic and multidimensional interactive nature of psychological resilience. The analysis reveals that different types of risk factors can contribute to psychological burden and adaptation difficulties during cancer treatment and recovery, while resilience often emerges through the joint contribution of protective resources across multiple levels. Lu et al. pointed out in a systematic evaluation that the participation behavior of cancer patients in the preoperative prehabilitation stage was influenced by the interaction of individual motivation, environmental resources, social support, and other multidimensional factors, further confirming the research orientation that protective mechanisms need to be intervened with comprehensive strategies [95].

For example, physiological risks such as pain and treatment-related side effects may undermine patients' sense of control, whereas individual-level factors like self-efficacy and physician–patient communication quality can mitigate these negative effects [63]. Studies based on the theoretical domain framework have pointed out that self-management behavior is influenced by a variety of cross-cutting factors, with self-efficacy, social identity, and outcome beliefs being the key moderating variables, further corroborating the central role of an individual's cognitive resources in risk regulation [96]. Recent empirical findings confirm that resilience functions as a mediator between psychological distress and quality of life in cancer patients, underscoring its clinical relevance in survivorship care [97]. Psychosocial risks including social exclusion and caregiver conflict may be alleviated through family cohesion and intimate relationships [62]. Meanwhile, cultural risks such as stigma and traditional beliefs may require collective support from community organizations, religious groups, or public awareness campaigns for effective adjustment [43,84].

This cross-level interaction model moves beyond the traditional understanding of resilience as a static individual trait, and instead conceptualizes resilience as a “product of multi-systemic regulation”, highlighting its systemic and processual nature.

5.3. Methodological integration and theoretical shifts

From a methodological perspective, research on psychological resilience has exhibited a marked trend toward “multi-methodological integration.” Although traditional quantitative approaches continue to dominate—especially techniques such as structural equation modeling (SEM), latent profile analysis (LPA), and multilevel regression, which are widely employed to construct path models, validate variable relationships, and identify heterogeneous subgroups—qualitative and mixed-method approaches have significantly increased in recent years. These methods emphasize deeper exploration of cancer patients' subjective experiences and resilience-building processes through narrative interviews, phenomenological analysis, and focus groups.

For instance, several studies listed in **Table 5** adopt interview-based methods to investigate how cancer patients construct meaning, integrate traumatic experiences, and develop adaptive strategies under the pressures of illness. Systematic reviews and meta-synthesis studies have also contributed theoretical depth by refining research themes and integrating intervention evidence. Collectively, these methodological trends demonstrate a theoretical shift from “mechanism validation” to “process-oriented understanding.” Future research should further prioritize longitudinal track-

ing and cross-cultural comparative studies to expand the conceptual boundaries of psychological resilience.

5.4. Limitations and future directions

Despite notable theoretical and practical achievements, several limitations persist in current research. First, most studies focus primarily on breast and lung cancer patients, while other cancer types—such as gastrointestinal, neurological, and hematological malignancies—remain underrepresented, indicating limited sample diversity. Second, existing research predominantly examines individual-level variables, with insufficient modeling of relational network variables such as family system functioning, caregiving consistency, and community support dynamics, necessitating further theoretical elaboration of “systemic resilience.” Third, research on special populations—including ethnic minorities, cultural minority groups, Indigenous populations, and gender-diverse individuals—remains sparse. Greater emphasis should be placed on culturally sensitive research and the development of localized intervention strategies.

Additionally, studies addressing novel stressors in the context of the COVID-19 pandemic are still limited, and investigations into the stress and long-term resilience mechanisms associated with the pandemic are in their early stages. Future studies should incorporate the psychological regulation mechanisms under public health emergencies. In terms of methodology, the integration of multimodal data (e.g., physiological indicators, digital footprints, interactive interviews) is recommended to develop more dynamic resilience monitoring systems, thereby enhancing the translation of theory into real-world applications.

Moreover, the use of a single database (Web of Science, WOS) may have restricted the comprehensiveness of the literature search, as relevant studies indexed in PsycINFO, Scopus, or CINAHL might not have been captured. Future research should therefore consider expanding database coverage to improve representativeness. In addition, cultural and contextual variations across the included studies limit the generalisability of the findings. Cross-cultural comparative designs and culturally sensitive frameworks are recommended to strengthen the external validity and global applicability of resilience research. Recent cross-sectional evidence also indicates that spirituality and faith act as culturally embedded protective factors that enhance psychological resilience among cancer patients receiving oncological treatment [98].

In summary, research on psychological resilience among cancer patients is at a pivotal stage of theoretical refinement and empirical expansion. The identification of multidimensional risks and the integration of cross-level protective mechanisms provide a solid foundation for constructing psychologically adaptive models centered on the co-creation of “individual-relational-environmental” dynamics. Future studies should continue to promote interdisciplinary integration and translational intervention research, thereby contributing to the development of a more scientific, precise, and human-centered psychological support system in cancer care.

6. Conclusion

Guided by the dual framework of risk and protection, this systematic review integrated bibliometric and thematic analyses of 60 studies published between 2009

and 2025 to map the development of psychological resilience research in cancer care. The findings show that resilience has become an emerging interdisciplinary focus linking psycho-oncology, nursing, and health psychology, with a marked increase in publications since 2018.

By constructing a cross-matrix of biomedical, psychosocial, and cultural risk factors against individual, familial, and community-level protective mechanisms, this review demonstrates that resilience is shaped by the interaction of multiple systems rather than by isolated traits. The approach highlights how self-efficacy, family cohesion, and community participation collectively buffer the effects of stressors and treatment burdens.

Methodologically, research in this domain is moving toward greater integration of mixed and qualitative methods, enhancing understanding of subjective experiences and cultural contexts. Despite these advances, gaps remain in sample diversity, cultural sensitivity, and intervention-based designs. Future studies should expand database coverage, adopt cross-cultural and longitudinal perspectives, and translate theoretical models into practical, evidence-based resilience interventions.

Overall, psychological resilience in cancer patients represents a dynamic and relational process shaped by interactions among individuals, families, and social environments. Strengthening these multilevel protective systems can inform clinical practice, psychosocial care, and policy development to promote holistic well-being in oncology populations.

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