

Review

Defining fear of cancer recurrence using Rodgers' evolutionary concept analysis

Chunmei Liu*, Liu He

Department of Oncology, Chengdu Seventh People's Hospital (Affiliated Cancer Hospital of Chengdu Medical College), Chengdu 610213, China

* Corresponding author: Chunmei Liu, 13438851445@163.com

CITATION

Liu C, He L. Defining fear of cancer recurrence using Rodgers' evolutionary concept analysis. *Psycho-Oncologie*. 2025; 19(4): 4100.
<https://doi.org/10.18282/po4100>

ARTICLE INFO

Received: 13 February 2025
Revised: 10 March 2025
Accepted: 17 March 2025
Available online: 10 December 2025

COPYRIGHT

Copyright © 2025 by author(s).
Psycho-Oncologie is published by PiscoMed Publishing Pte. Ltd. This work is licensed under the Creative Commons Attribution (CC BY) license.
<https://creativecommons.org/licenses/by/4.0/>

Abstract: The concept of fear of cancer recurrence (FCR) is defined and analyzed. **Methods:** A systematic search was conducted for relevant literature on fear of cancer recurrence in Chinese databases, including CNKI, WanFang, Weipu, and the China Biomedical Literature Service System, as well as in English databases such as PubMed and Web of Science. Rodgers' evolutionary concept analysis method was employed to analyze the selected literature. **Results:** Rodgers' evolutionary concept analysis revealed that the concept of FCR encompassed psychological distress characteristics that dynamically evolved with disease manifestations. Antecedent variables included demographic factors, disease and treatment-related factors, psychological factors, and family and social influences. The consequences of this fear involved an exacerbation of negative emotional burdens among cancer patients, a detrimental impact on their health-related quality of life, and the emergence of maladaptive negative behaviors. **Conclusion:** FCR is a multidimensional and dynamic concept. Healthcare staff needs to incorporate FCR into clinical screening processes to improve the early identification of fear of cancer recurrence in cancer patients.

Keywords: fear of cancer recurrence; Rodgers' evolutionary concept analysis; literature review

1. Introduction

According to the latest data from the International Agency for Research on Cancer in 2022, approximately 20.0 million new cancer cases are reported globally each year, resulting in nearly 10 million deaths [1]. Cancer not only jeopardizes patients' physical and mental health but also imposes significant disease and economic burdens on families and society. With the emergence of psychosocial oncology, fear of cancer recurrence (FCR) has increasingly become a focal point in cancer psychosocial care research [2]. Treatment modalities such as surgery, radiotherapy, and chemotherapy can inflict considerable physical and psychological distress on cancer patients, leading to the development of FCR. Research indicates that the incidence of FCR ranges from 33% to 97%, with many patients continuing to experience low to moderate levels of fear even five years post-diagnosis [3,4]. For the majority of cancer survivors, FCR represents a prevalent form of psychological distress [5]. FCR is closely associated with disease prognosis and can significantly affect patients' quality of life, social functioning, confidence, and treatment adherence [6]. While research on FCR has been conducted internationally for some time, there has been a growing interest in this area within China in recent years [7]. However, Chinese researchers have yet to provide a clear description and exploration of the concept of FCR. Analyzing this concept can help reduce its ambiguity, clarify its

definition, and prevent incorrect applications in nursing theory and research. In this study, we employed Rodgers' evolutionary concept analysis method to analyze and explore the connotation of FCR to provide a foundation for healthcare staff to identify FCR in cancer patients early, develop localized assessment tools, and implement clinical intervention studies.

In light of increasing cancer diagnoses within China, healthcare providers have recognized that addressing the psychological aspects of their patient's disease at diagnosis and throughout treatment is just as crucial as dealing with their biological conditions. In Chinese culture, illness, death, and recurrence are considered taboo, and patients should suppress their emotions under normal pressure and avoid discussing FCR. Social stigma and taboos exacerbate feelings of isolation and hinder psychological support. Patients now live with a cancer diagnosis and think of it as part of their lives, facing insurmountable psychological battles like FCR. This psychological burden affects not just them as individuals but also their families and caregivers, making FCR a priority in the care of cancer patients. The interest in mental health in cancer care has led to the introduction of numerous psychosocial interventions to tackle FCR, although in the Chinese healthcare system, most are rarely utilized [8].

In addition, a growing body of research in China has probed into cultural variables that may play a role in determining the experience of FCR. Putnam et al. suggested that FCR could be experienced differently between patients in Western societies and those in China [9]. The reason for this might be cultural differences in coping mechanisms, social support, and attitudes about illness and death. For instance, many Chinese patients have historically been hesitant to discuss their worries about recurrences, in part due to the taboo in society about such illness. This cultural element might worsen the emotional distress that accompanies FCR as, in the eyes of the patient, people may seem socially isolated or unsupported in dealing with their fears [10]. So, developing culturally relevant interventions and assessment tools is vitally important.

An analysis of the concept of FCR is a step toward improving care and support for cancer survivors. A clarification of the concept is aimed at diminishing ambiguities behind the definition of FCR and preventing its misappropriation in nursing and practice. This study intends to deepen the understanding of FCR and its impact on psychosocial care for cancer patients through Rodger's evolutionary concept analysis. By addressing these questions, we hope to advance FCR recognition in cancer patients early, foster culturally sensitive and effective diagnostic tools, and execute clinical intervention studies to alleviate cancer survivors' FCR burden and improve the psychological well-being of these groups.

As FCR remains a paramount challenge for cancer survivors worldwide and in China, understanding this research would enhance public health policy formulation. It will guide future clinical interventions aimed at upgrading the mental health support of cancer patients. This research will lay the groundwork for effective psychological care strategies geared towards the FCR, with an overarching holistic perspective on cancer survivorship that incorporates physical and mental health care [11–13].

2. Materials and methods

2.1. Literature search

A systematic literature search was conducted in Chinese and English databases for perspectives on fear and anxiety. Because of the subject of the fear of cancer hosts, free words and subject terms were included. The Chinese databases included some English-language databases, such as CNKI (China National Knowledge Infrastructure), WanFang, Weipu, and the China Biomedical Literature Service System: PubMed, Web of Science, OVID, and EMBASE. These databases were selected with sufficient evidence to represent a broad range of literature, including local and national comparative studies.

The keywords used for the search encompassed “fear of cancer recurrence”, “fear of disease progression”, “fear of progression”, “fear of cancer progression”, and “fear of disease progression”. The latest literature that contemplates various expressions about fear in cancer survivors was considered, focusing on fear’s emotional and mental dimensions. Further elaboration of the search was made with subject terms such as “psychosocial oncology”, “cancer survivorship”, and “psychological distress”. The search was made from the inception of these databases up to 31 January 2023, after using the search terms queried, resulting in a total of 4511 journal articles.

Two independent researchers performed the literature screening to guarantee data quality. The term “doubled screening” was adopted to advance objectivity and reduce the risk of bias raised by weeders. All disagreements were mediated by a third researcher, reaching a consensus. Because of the process, this reinforced treatment safeguards the correctness and validity of the studies to accompany the reviewed analysis.

2.2. Literature inclusion

Inclusion and exclusion criteria enabled the rigorous determination of the quality and relevance of the studies included in the review. To qualify for inclusion, studies had to meet the following requirements:

1) **Subject of the study:** Cancer patients have been included as subjects in the studies sufficiently explaining the psychological aspects of cancer survivorship, focused solely on concerns over the recurrence of a diagnosed cancer.

2) **Primary research on FCR:** The studies must include FCR as their primary subject, including definitions, methods of measuring FCR, factors and their effects that contribute to FCR, such as psychological and social variables, indicators of outcome (such as quality of life or treatment adherence), and intervention strategies directed at addressing FCR. This criterion was necessary to ensure that studies were closely related to the central concept being investigated.

3) **Language:** Works available only in either Chinese or English would be included for study, ensuring the promotion of accessibility and relevance to the audience being researched.

The exclusion criteria were also detailed to eliminate irrelevant or low-quality studies:

1) **Irrelevant studies:** Studies that did not relate to FCR or the psychological aspects of cancer survivorship were excluded.

2) **Duplicate publications:** Duplicate publications were excluded to avoid redundancy so that only one instance of each study was counted.

3) **Inaccessible full text:** Studies for which the full text was unavailable were excluded, as this limitation restricted the ability to assess the full scope of the research.

The initial search yielded 4511 articles, which were screened for relevance. Finally, after applying the inclusion and exclusion criteria, the final analysis included 44 studies. This included 16 Chinese and 28 English studies, balancing the representation of the global literature on FCR in cancer patients.

2.3. Rodgers' evolutionary concept analysis

Rodgers' evolutionary concept analysis method was thus employed so cancer survivors could appropriate the process and the resultant understanding of the FCR. This method is useful for clarifying and defining concepts in psychosocial oncology, an evolving and complicated domain. Rodgers' framework identifies and utilizes seven distinct steps:

1) **Concept Identification and Naming:** The definition of the concept of FCR was delineated with an effort to name it in a way that reflects its psychological and emotional facets.

2) **Definition of synonyms and variations in usage:** We then identified synonyms and related concepts to FCR (such as "fear of recurrence", "anxiety about recurrence", and "cancer-related distress") that are often used interchangeably. This consequently helped engender the various pathways in which this fear was conceptualized along varying studies and contexts.

3) **Selection of appropriate domains for data collection:** The study in this step consisted of selecting and identifying the most salient studies and subjects from which data could be retrieved. These studies included evidence-oriented empirical studies and theoretical work that contributed to formulating and developing the concept of FCR.

4) **Identification of attributes of FCR:** The defining attributes of FCR include deep-seated anxiety about cancer recurrence, emotional distress, avoidant behavior, and the impact FCR has on the patient's quality of life. These attributes represent the core characteristics consistently identified in the literature review.

5) **Identification of factors antecedent to and consequences of FCR:** Resp. analysis brought to light various antecedents (e.g., a previous cancer diagnosis, treatment history, and psychological vulnerability) and consequences (e.g., quality of life in decline, issues with adherence to treatments) influencing FCR or to which FCR has an effect.

6) **Outlining the relation with FCR:** Related concepts, namely cancer survivorship, psychosocial adjustments, and health-related quality of life, were explored to expand the understanding of what FCR entails in the broad-spectrum context of cancer recovery and psychosocial care.

7) Case Analysis of FCR: The final step included reviewing case illustrations and examples available in the literature to illustrate typical manifestations of FCR and demonstrate the various manifestations concerning their context of highest prevalence.

For reliability and meaning, at least 20% of the total literature or a minimum of 30 studies should be included in concept analysis. In light of this criterion, the study was conducted to thoroughly examine the issues concerning studies involving FCR in cancer patients to ensure that a sufficient number of published reports were included to draw reasonable conclusions about the concept.

Using this approach, we sought to gain a detailed understanding of FCR characteristics and impact on the psychological well-being of cancer patients while laying the groundwork for future meaningful assessment tools.

3. Results

3.1. The evolution of the concept of FCR

Fear of Cancer Recurrence (FCR) has grown out of psychosocial oncology and refers to chronic and persistent anxiety resembling a “sword of Damocles” hung over the heads of patients [10]. Northouse’s definition in 1981 examined the concern of patients regarding the return of their cancer [11]; in other words, it emphasized the patients’ subjective experience of uncertain emotions or current anxiety regarding the possibility of the return of their cancer. Hodges and colleagues later applied Northouse’s definition specifically to look into ranges of FCR in head and neck cancer patients, furnishing early empirical evidence for the importance of the concept within oncology [14].

According to Lebel et al., “fear of cancer recurrence” refers to “fear, worry, or concern relating to the possibility that cancer will come back or progress”, thus showing its effect on cancer survivors [15]. This broadened definition now included the manifestations of the condition that many cancer survivors fear, namely recurrence, progression, and metastasis. This definition has subsequently become widely used in studies across various forms of cancer. In 2010, Simard et al. introduced the notion that FCR should necessarily be considered a specific and enduring form apart from anxiety disorders [16]. As an anxiety factor, FCR could consequently be either a normal or pathological reaction depending on its level of persistency and intensity. An expert panel from the University of Ottawa used Delphi techniques; in 2016, they developed a definition that reached a consensus: FCR is fear or worry related to a possible return or progression of cancer [15]. These two groups catered to the broadest range of patients: survivors worried about recurrence after remission and those with an advanced stage of cancer fearing the progression of the disease.

In this final definition of FCR, Mutsaers et al. [17] have refined the clinical manifestations of FCR, stating that it should not be viewed merely as an occasional worry but as a more persistent worry occurring for months or years and causing anxiety and hypervigilance regarding physical symptoms. The above definition is now found in clinical practice and research, emphasizing the fear’s debilitating, chronic nature.

In all these definitions, FCR has progressed from nothing, merely a concept of fear, to being viewed as a much more complex and multifaceted phenomenon that offers psychological distress to cancer patients [18]. The concept has grown from

earlier considerations of surface anxieties relating simply to fear to much higher levels of subtlety that include hypervigilance and distress over the process of cascading recurrence of cancer and the possibilities for cancer progression.

3.2. Alternative terms and differentiation of related terminology

3.2.1. Alternative terms

Nevertheless, alternative terms used for FCR, such as “fear of progression” (FOP), have often been used interchangeably in the literature. FOP was first put forward by Dankert in 2003 and delineated the fear regarding the advancement of the disease in patients already diagnosed with cancer, as opposed to a return of the disease [19]. This difference is subtle yet significant in placing the manifestation of FCR and FOP in separate patient populations. The FCR concept essentially concerns survivors who are either in remission or free of active disease and are anxious about the possible return of cancer. Conversely, those who fear their condition will worsen without clear remission will be labeled as FO.

In 2014, Herschbach et al. mentioned that the characteristics of FOP and FCR would often seem similar, thereby allowing for the interchangeability of the terms in numerous contexts [20]. Cheng also argued that while there are some minor differences in the definitions of FOP and FCR, the implicit characteristics of these concepts are still commonly similar and frequently interchangeable in global studies [21]. This body of research asserts that while FCR and FOP may manifest in different clinical settings, psychological phenomena overlap more significantly. Accordingly, this study accepts FOP as an alternative term for FCR in acknowledgment of the commonality between the two terms, expressing psychological concerns about disease progression and recurrence that are important to survivorship in cancer patients.

3.2.2. Differentiation of related terms

FCR could be viewed as anxiety towards death, a common psychological problem that patients with advanced cancer may face. While FCR concerns itself specifically with the recurrence or progression of cancer, DA involves itself with some relatively existential fear of death, dying, and post-mortem fear [22]. According to Ferrell et al., breast cancer patients commonly express fears of not just a recurrence of the disease but also their demise, suggesting that DA might be linked to FCR [23]. However, the key difference lies in the populations they target. DA, in general, affects patients near the end of life, while FCR affects cancer survivors who are in remission and remain fearful about the comeback of their illness.

Berlin recommended that DA and FCR be viewed as psychological distress in connection with cancer patients’ psychological issues [24]. While FCR mainly deals with the emotional and psychological issues associated with cancer treatment and remission, DA deals with the existential aspect of living with a life-threatening illness. The overlap between these two types of anxiety has inspired greater calls for separation in research to better examine the psychological needs of cancer patients at each phase of treatment and survivorship.

Understanding these terms allows them to provide care and POP to cater to more specific psychological needs of cancer patients [25]. While FCR is often reported in

survivorship care plans, DA needs more discerning questioning, especially in palliative and end-of-life settings.

3.3. Attributes

Attributes clarification is important in distinguishing a concept from similar psychological phenomena. As per the identification by the literature, the primary attributes of FCR are psychological distress and spontaneous changes in the intensity of fear. According to Lee-Jones and others, cognitive mechanisms related to FCR can be elicited by internal and external stimuli, wherein the degree of fear changes depending on changes in disease presentation [26]. As cancer patients undergo treatment, their experiences of fear evolve. Deuning-Smit found that in her longitudinal study on head-and-neck cancer patients, FCR dropped off slightly after three months but stabilized after six months of treatment [11]. Similar findings are recorded in Hong's study, where FOP (fear of progression) declined over time, particularly after the sixth cycle of chemotherapy [27]. This further indicates that FCR changes with the patient's treatment and recovery.

FCR dynamically implies that the cancer survivor has, from time to time, waves of anxiety regarding his/her diagnosis and treatment. Initially, the FCR is high, which is consequent to uncertainty about diagnosis and the immediate threat posed by the disease. As the treatment unfolds and the patient achieves remission, the fear subsides, although fear might resurface in tandem with the latest challenge experienced or because of signs of disease progression. Therefore, FCR can be characterized as a dynamic state subjected to multifaceted influences that include, but are not limited to, the stage of the disease, treatment progress, and psychological coping impairment.

3.4. Antecedent variables

Antecedents refer to characteristic variables that occur prior to a conceptual event or experience and contribute to its occurrence [28]. Cancer is classified as a significant negative life event. According to literature analysis, FCR denoted the psychological state of fearing, worrying about, or being anxious regarding the possibility of cancer recurrence or progression. Consequently, its antecedent factors primarily were as follows.

3.4.1. Demographic factors

Age, gender, status of employment, and educational level have been widely accepted as statistically significant predictors of FCR among cancer patients [29–32]. Young patients exhibit more FCR than older patients. Young patients have fewer experiences of life than older ones and are often emotionally less resilient and more susceptible to stress regarding their illness. While employed patients, prisoners normally have more FCR than retirees due to balancing their illness with work-role stress and responsibilities, were more likely to focus on family or personal health interests, and not contend with work-related issues. Fear of recurrence escalates with a greater level of education, as educated people might have more knowledge about the disease and therefore be awake and anxious about potential recurrence as compared to less educated counterparts, who may perhaps enjoy not much fear through lack of information about their diagnosis or lesser awareness of the threat of recurrence to

their survival [33,34]. These factors depict how the overall psychosocial experience of FCR may be shaped by individual demographic attributes, affirming the need for tailored interventions related to those attributes.

3.4.2. Disease and treatment-related factors

Research indicated that cancer-related symptoms [35], cancer pain [36], chemotherapy [37], and tumor size and number [38] are significant risk factors for FCR among patients. The side effects of cancer treatment can lead to weight loss, nausea, vomiting, and unfavorable biochemical markers, which cancer survivors may associate with the potential for recurrence [38]. Furthermore, cancer survivors often link abnormal or uncomfortable bodily sensations to the possibility of cancer recurrence. Thus, the painful treatment process and negative experiences related to illness can contribute to the development of fear of recurrence.

3.4.3. Psychological health factors

Adverse psychological health factors significantly contribute to the fear of cancer recurrence among cancer patients. Psychological distress, hopelessness, anxiety, and depression can reduce patients' resilience, heightening their perception and experience of cancer-related symptoms and amplifying their fear of recurrence [39,40]. Cancer patients' intensity of negative emotions and emotional expressions correlates positively with their FCR levels [41]. Conversely, patients with a positive psychological outlook are better equipped to cope with illness, maintaining an optimistic attitude during treatment, which is associated with lower FCR levels [42].

3.4.4. Family and social factors

Family burdens, financial stress, and social support are independent predictors of FCR. Following a cancer diagnosis and subsequent treatment, patients frequently encounter significant medical expenses, raising concerns about the financial crisis that recurrent illness may precipitate [43]. Additionally, lower levels of social support are linked to decreased resilience, reduced life expectancy, and diminished hope among patients [44]. Consequently, cancer patients facing substantial family financial burdens and low levels of social support exhibit heightened fear of disease changes and increased susceptibility to FCR.

3.5. Consequences

Consequences refer to events following the conceptual state or situations arising from the concept's existence [43,44].

3.5.1. Increased burden of negative emotions

FCR can function as a mediating variable, directly or indirectly leading to adverse emotions, thereby exacerbating the burden of negative emotions. Research suggested that fear of recurrence moderates the relationship between fatigue and anxiety in breast cancer survivors, as well as between fatigue and stress, with fatigue being a direct predictor of depression [45,46]. Additionally, FCR can contribute to psychological issues such as social restriction and stigma, resulting in poor psychosocial adaptation [45].

3.5.2. Deterioration of health-related quality of life

Beyond objective external factors, FCR is a crucial contributor to cancer patients' decline in quality of life [47]. Studies indicate that cancer survivors with high FCR levels often engage in persistent and prolonged rumination about recurrence, leading to intrusive thoughts [38,47–50]. These intrusive thoughts are associated with pain levels and physical functioning, which may adversely affect the psychological well-being of cancer patients, subsequently impacting rehabilitation and long-term survival rates, ultimately resulting in a decline in quality of life [49–51].

3.5.3. Emergence of maladaptive negative behaviors

Malignant tumors are characterized by high rates of recurrence and metastasis, and the genuine fears experienced by cancer patients may stem from their unique experiences with the disease. Patients exhibiting higher FCR levels frequently engage in excessive worry about their condition, leading to avoidance or suppression behaviors, such as evading disease monitoring, reduced medication adherence, and reluctance to attend follow-up appointments [52,53]. Additionally, they may alter their lifestyle choices, including increased smoking and alcohol consumption, irregular exercise, and dietary habits [54].

3.6. Typical cases

Conducting a conceptual analysis of typical cases aids in further identifying, analyzing, and understanding the connotation of the concept.

3.6.1. Typical case

Ms. Li, a 60-year-old farmer with a primary school education, was unemployed and diagnosed with stage IIb colon cancer. Her family consisted of a 35-year-old son, a 5-year-old grandson, a 33-year-old daughter who lived far away, and a 62-year-old husband. Her parents have passed away due to illness, and she lived with her son, daughter-in-law, grandson, and husband, with limited interaction with relatives. Currently, Li is undergoing her third cycle of chemotherapy, experiencing significant side effects, including nausea, vomiting, reduced appetite, and hair loss. Her husband worked away from home, so she frequently attended chemotherapy alone. The family faced a considerable economic burden due to the young grandson. Since diagnosis, she often expresses confusion and frustration to her healthcare providers, stating, “Our family emphasizes healthy eating, and I exercise regularly. I don’t understand why I got cancer”. After experiencing two recurrences, she remarked, “The doctor told me this time the recurrence index is very high. The interval between the first and second recurrences was less than six months. This has affected me the most. I am very upset”. She did not consistently attend her chemotherapy sessions and exhibited significant anxiety, saying, “This chemotherapy affects my physical strength and immunity; there’s no way to control the recurrence”.

3.6.2. Case analysis

Ms. Li’s case verifies the multidimensionality and dynamics of FCR. Her emotional distress (anxiety and depression) corresponds to the attributes of FCR; her age, education level, family support, etc., correspond to the antecedents of FCR; her negative emotional burden and decreased quality of life correspond to the

consequences of FCR. Ms. Li exhibited classic signs of FCR. Several antecedent factors contributed to her fear, including her middle age, low educational level, unemployment, and female gender, all of which played a role in her heightened anxiety. Additionally, as the main caregiver of the family, Ms. Li not only has to deal with her own illness but also bears the economic pressure of the family. The double burden exacerbates her anxiety and fear, making her feel even more helpless when facing cancer recurrence. Her low level of family support, substantial economic burden, and severe chemotherapy-related symptoms placed her under greater psychological stress compared to typical patients, further intensifying her FCR. During the treatment process, she displayed significant anxiety, repeatedly inquiring about the cause of her illness and failing to adhere to the prescribed chemotherapy schedule, which reflected negative compliance behavior. Therefore, oncology healthcare staff should assess the psychological state and specific manifestations of the patient, proactively addressing her mental health throughout the treatment process and providing appropriate psychological support and counseling. Ms. Li's FCR performance reflects the dynamism and multidimensionality of FCR mentioned in the literature. Her anxiety and depressive moods fluctuate with the progression of treatment, indicating that FCR is a dynamic state influenced by various factors. Through early identification and intervention, her psychological state and quality of life can be significantly improved. For Ms. Li's situation, the following intervention strategies are recommended: 1) Psychological support, such as cognitive-behavioral therapy, to help her cope with anxiety and depression; 2) family support intervention, to help her family understand her psychological state and provide emotional support; 3) strategies to improve treatment adherence, such as regular follow-ups and health education, to help her better manage her illness.

3.7. Conceptual framework of FCR

The conceptual framework of fear of cancer recurrence was shown in **Figure 1**.

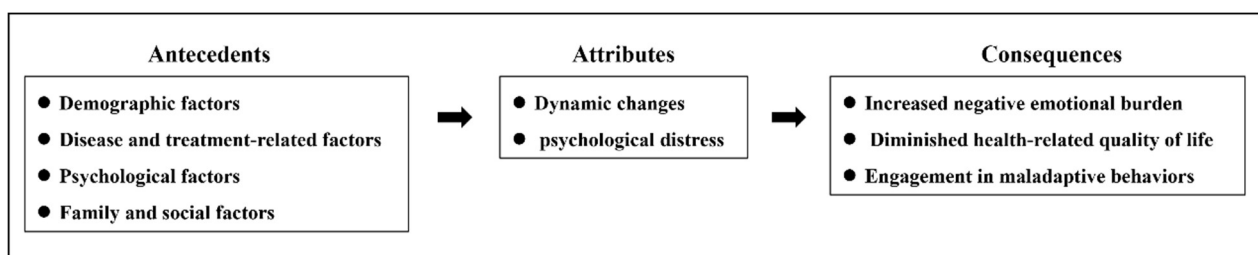


Figure 1. Conceptual framework of fear of cancer recurrence.

Note: The attributes, antecedents, and consequences within the framework were distilled through a comprehensive analysis of 44 studies. The attributes include emotional distress, cognitive hyper-vigilance, and behavioral avoidance; the antecedents include demographic factors, disease and treatment-related factors, psychological factors, and family and social factors; the consequences include increased negative emotional burden, deterioration of quality of life, and maladaptive behaviors.

4. Conclusion

This study analyzed the multidimensionality and dynamics of cancer recurrence fear (FCR) using Rodgers' evolutionary concept analysis method. FCR is an important field in psychological oncology, which is heavily influenced by demographic, disease,

psychological, family, and social factors, seriously affecting the quality of life of patients. Future research should explore cultural differences and develop assessment tools and intervention strategies suitable for Chinese patients. In clinical practice, medical staff should pay attention to FCR and adopt strategies such as psychological therapy (such as CBT and mindfulness therapy), social support (such as support groups), cultural sensitivity intervention (such as Tai Chi), educational information, and regular follow-up to alleviate FCR and improve patients' mental health. In the future, it is necessary to verify the effectiveness of interventions and develop more localized FCR management tools.

Author contributions: Conceptualization, CL and LH; methodology, CL; software, CL; validation, CL and LH; formal analysis, CL and LH; investigation, CL and LH; resources, CL and LH; data curation, CL and LH; writing—original draft preparation, CL; writing—review and editing, CL; visualization, CL and LH; supervision, CL; project administration, CL; funding acquisition, CL. All authors have read and agreed to the published version of the manuscript.

Ethical approval: Not applicable.

Informed consent statement: Not applicable.

Conflict of interest: The authors declare no conflict of interest.

References

1. Bray F, Laversanne M, Sung H, et al. Global cancer statistics 2022: GLOBOCAN estimates of incidence and mortality worldwide for 36 cancers in 185 countries. *CA: A Cancer Journal for Clinicians*. 2024; 74(3): 229–263. doi: 10.3322/caac.21834
2. Lang-Rollin I, Berberich G. Psycho-oncology. *Dialogues in Clinical Neuroscience*. 2018; 20(1): 13–22. doi: 10.31887/dcons.2018.20.1/ilangrollin
3. Koch L, Jansen L, Brenner H, Arndt V. Fear of recurrence and disease progression in long-term (≥ 5 years) cancer survivors—a systematic review of quantitative studies. *Psycho-Oncology*. 2012; 22(1): 1–11. doi: 10.1002/pon.3022
4. Simard S, Thewes B, Humphris G, et al. Fear of cancer recurrence in adult cancer survivors: A systematic review of quantitative studies. *Journal of Cancer Survivorship*. 2013; 7(3): 300–322. doi: 10.1007/s11764-013-0272-z
5. Fang TT. Analysis of the current status and influencing factors of fear of cancer recurrence in lung cancer patients [Master's thesis]. Anhui Medical University; 2022.
6. Hao XY, Li H, Zhan TX. Research status of fear of cancer recurrence. *Chinese Modern Nursing Journal*. 2022; 28(17): 2376–2380.
7. Zheng MM, Wan HW, Zhu Y. A visual analysis of the research on fear of cancer recurrence in the last decade at home and abroad based on CiteSpace. *Shanghai Nursing*. 2022; 22(11): 62–66.
8. Teo I, Krishnan A, Lee GL. Psychosocial interventions for advanced cancer patients: A systematic review. *Psycho-Oncology*. 2019; 28(7): 1394–1407. doi: 10.1002/pon.5103
9. Putnam G, Williams T, Park S, et al. Current Trends in Breast Cancer Treatment in Chinese and Chinese American Women. *Annals of Plastic Surgery*. 2024; 92(4): 463–468. doi: 10.1097/sap.0000000000003826
10. Li MC, Cheng HL. Fear of cancer recurrence, supportive care needs, and the utilization of psychosocial services in cancer survivors: A cross-sectional survey in Hong Kong. *Psycho-Oncology*. 2020; 30(4): 602–613. doi: 10.1002/pon.5609
11. Deuning-Smit E, Custers JAE, Braam CIW, et al. Toward implementation of an evidence-based intervention for fear of cancer recurrence: Feasibility in real-world psycho-oncology practice. *Psycho-Oncology*. 2024; 33(1). doi: 10.1002/pon.6297
12. Zdenkowski N, Tesson S, Lombard J, et al. Supportive care of women with breast cancer: Key concerns and practical solutions. *Medical Journal of Australia*. 2016; 205(10): 471–475. doi: 10.5694/mja16.00947

13. Mardani A, Farahani MA, Khachian A, Vaismoradi M. Fear of Cancer Recurrence and Coping Strategies among Prostate Cancer Survivors: A Qualitative Study. *Current Oncology*. 2023; 30(7): 6720–6733. doi: 10.3390/curroncol30070493
14. Hodges LJ, Humphris GM. Fear of recurrence and psychological distress in head and neck cancer patients and their carers. *Psycho-Oncology*. 2008; 18(8): 841–848. doi: 10.1002/pon.1346
15. Lebel S, Ozakinci G, Humphris G, et al. From normal response to clinical problem: Definition and clinical features of fear of cancer recurrence. *Supportive Care in Cancer*. 2016; 24(8): 3265–3268. doi: 10.1007/s00520-016-3272-5
16. Simard S, Savard J, Ivers H. Fear of cancer recurrence: Specific profiles and nature of intrusive thoughts. *Journal of Cancer Survivorship*. 2010; 4(4): 361–371. doi: 10.1007/s11764-010-0136-8
17. Mutsaers B, Butow P, Dinkel A, et al. Identifying the key characteristics of clinical fear of cancer recurrence: An international Delphi study. *Psycho-Oncology*. 2019; 29(2): 430–436. doi: 10.1002/pon.5283
18. Zhang HF, Lin ZH, Li J, et al. Potential profile analysis of fear of cancer recurrence in breast cancer patients. *Nursing research*. 2022; 36(22): 4013–4017.
19. Dankert A, Duran G, Engst-Hastreiter U, et al. Fear of progression in patients with cancer, diabetes mellitus and chronic arthritis. *Rehabilitation (Stuttg)*. 2003; 42(3): 155–163.
20. Herschbach P, Dinkel A. Fear of progression. *Recent Results Cancer Research*. 2014; 197: 11–29.
21. Cheng CY. An empirical study of cognitive behavioral intervention on fear of disease progression in patients with non-Hodgkin lymphoma [Master's thesis]. Zhengzhou University; 2020.
22. Harnischfeger N, Rath HM, Alt-Epping B, et al. Association between oncologists' death anxiety and their end-of-life communication with advanced cancer patients. *Psycho-Oncology*. 2023; 32(6): 923–932. doi: 10.1002/pon.6132
23. Ferrell BR, Grant M, Funk B, et al. Quality of life in breast cancer. *Cancer Nursing & Trade*. 1998; 21(1): 1–9. doi: 10.1097/00002820-199802000-00001
24. Berlin P, von Blanckenburg P. Death anxiety as general factor to fear of cancer recurrence. *Psycho-Oncology*. 2022; 31(9): 1527–1535. doi: 10.1002/pon.5974
25. Jacobsen PB, Andrykowski MA. Tertiary prevention in cancer care: Understanding and addressing the psychological dimensions of cancer during the active treatment period. *American Psychologist*. 2015; 70(2): 134–145. doi: 10.1037/a0036513
26. Lee-Jones C, Humphris G, Dixon R, Hatcher MB. Fear of cancer recurrence—a literature review and proposed cognitive formulation to explain exacerbation of recurrence fears. *Psycho-Oncology*. 1997; 6(2): 95–105.
27. Hong, P. A longitudinal study on the trajectory of fear of disease progression and its influencing factors in colorectal cancer patients [Master's thesis]. Huzhou University; 2022.
28. Whitley GG. Concept Analysis of Fear. *International Journal of Nursing Terminologies and Classifications*. 1992; 3(4): 155–161. doi: 10.1111/j.1744-618x.1992.tb00531.x
29. Starreveld DEJ, Markovitz SE, van Breukelen G, Peters ML. The course of fear of cancer recurrence: Different patterns by age in breast cancer survivors. *Psycho-Oncology*. 2017; 27(1): 295–301. doi: 10.1002/pon.4505
30. Krok D, Telka E, Falewicz A, Szcześniak M. Total Pain and Fear of Recurrence in Post-Treatment Cancer Patients: Serial Mediation of Psychological Flexibility and Mentalization and Gender Moderation. *Journal of Clinical Medicine*. 2024; 13(7): 1974. doi: 10.3390/jcm13071974
31. Li Y, Fang C, Xiong M, et al. Exploring fear of cancer recurrence and related factors among breast cancer patients: A cross-sectional study. *Journal of Advanced Nursing*. 2023; 80(6): 2403–2414. doi: 10.1111/jan.16009
32. Aghdam AM, Rahmani A, Nejad ZK, et al. Fear of cancer recurrence and its predictive factors among Iranian cancer patients. *Indian Journal of Palliative Care*. 2014; 20(2): 128. doi: 10.4103/0973-1075.132632
33. Larsen C, Kirchhoff KS, Saltbæk L, et al. The association between education and fear of recurrence among breast cancer patients in follow-up—and the mediating effect of self-efficacy. *Acta Oncologica*. 2023; 62(7): 714–718. doi: 10.1080/0284186x.2023.2197122
34. Mahendran R, Liu J, Kuparasundram S, et al. Fear of cancer recurrence among cancer survivors in Singapore. *Singapore Medical Journal*. 2021; 62(6): 305–310. doi: 10.11622/smedj.2020007
35. Harnas SJ, Booij SH, Csorba I, et al. Which symptom to address in psychological treatment for cancer survivors when fear of cancer recurrence, depressive symptoms, and cancer-related fatigue co-occur? Exploring the level of agreement between three systematic approaches to select the focus of treatment. *Journal of Cancer Survivorship*. 2023; 18(6): 1822–1834. doi: 10.1007/s11764-023-01423-z

36. Tutelman PR, Chambers CT, Noel M, et al. Pain and Fear of Cancer Recurrence in Survivors of Childhood Cancer. *The Clinical Journal of Pain*. 2022; 38(7): 484–491. doi: 10.1097/ajp.0000000000001049
37. Hong SJ, Shin NM, Jung S. A predictive model of fear of cancer recurrence for patients undergoing chemotherapy. *Supportive Care in Cancer*. 2020; 28(9): 4173–4181. doi: 10.1007/s00520-019-05245-7
38. Kenny-Jones M, Nankivell P, Mehanna H, et al. Fear of Cancer Recurrence and Fear of Cancer Progression, Digital Resource Engagement and Health Literacy: A Review. *Current Oncology*. 2024; 31(12): 7586–7602. doi: 10.3390/curroncol31120559
39. Humphris GM, Rogers S, McNally D, et al. Fear of recurrence and possible cases of anxiety and depression in orofacial cancer patients. *International Journal of Oral & Maxillofacial Surgery*. 2003; 32(5): 486–491.
40. Yang Y, Sun H, Luo X, et al. Network connectivity between fear of cancer recurrence, anxiety, and depression in breast cancer patients. *Journal of Affective Disorders*. 2022; 309: 358–367. doi: 10.1016/j.jad.2022.04.119
41. Almeida SN, Elliott R, Silva ER, Sales CMD. Emotion-focused therapy for fear of cancer recurrence: A hospital-based exploratory outcome study. *Psychotherapy*. 2022; 59(2): 261–270. doi: 10.1037/pst0000389
42. Park S, Sato Y, Takita Y, et al. Mindfulness-Based Cognitive Therapy for Psychological Distress, Fear of Cancer Recurrence, Fatigue, Spiritual Well-Being, and Quality of Life in Patients With Breast Cancer—A Randomized Controlled Trial. *Journal of Pain and Symptom Management*. 2020; 60(2): 381–389. doi: 10.1016/j.jpainsymman.2020.02.017
43. Yang T, Zhu Z, Shi J, et al. Association among financial toxicity, depression and fear of cancer recurrence in young breast cancer patient-family caregiver dyads: An actor-partner interdependence mediation model. *BMC Psychiatry*. 2025; 25(1). doi: 10.1186/s12888-025-06546-4
44. Lu X, Wu C, Bai D, et al. Relationship between social support and fear of cancer recurrence among Chinese cancer patients: A systematic review and meta-analysis. *Frontiers in Psychiatry*. 2023; 14. doi: 10.3389/fpsy.2023.1136013
45. Kuswanto CN, Sharp J, Stafford L, Schofield P. Fear of cancer recurrence as a pathway from fatigue to psychological distress in mothers who are breast cancer survivors. *Stress and Health*. 2022; 39(1): 197–208. doi: 10.1002/smi.3180
46. Amani O, Mazaheri MA, Malekzadeh Moghani M, et al. Mediating effects of rumination on insomnia in cancer survivors: Influences of cancer-related fatigue, fear of recurrence, and psychological distress. *Cancer Medicine*. 2024; 13(18). doi: 10.1002/cam4.70189
47. Osann K, Wenzel L, McKinney C, et al. Fear of recurrence, emotional well-being and quality of life among long-term advanced ovarian cancer survivors. *Gynecologic Oncology*. 2023; 171: 151–158. doi: 10.1016/j.ygyno.2023.02.015
48. Coutts-Bain D, Sharpe L, Russell H. Death anxiety predicts fear of Cancer recurrence and progression in ovarian Cancer patients over and above other cognitive factors. *Journal of Behavioral Medicine*. 2023; 46(6): 1023–1031. doi: 10.1007/s10865-023-00422-w
49. Türkel A, Türkel NN, Kadioğlu A, et al. The mediating effect of intrusive rumination on the relationship between illness uncertainty and fear of cancer recurrence in breast cancer survivors. *BMC Women's Health*. 2025; 25(1). doi: 10.1186/s12905-025-03580-y
50. Cohee AA, Adams RN, Johns SA, et al. Long-term fear of recurrence in young breast cancer survivors and partners. *Psycho-Oncology*. 2015; 26(1): 22–28. doi: 10.1002/pon.4008
51. Zhang X, Sun D, Qin N, et al. Factors Correlated With Fear of Cancer Recurrence in Cancer Survivors. *Cancer Nursing*. 2021; 45(5): 406–415. doi: 10.1097/ncc.0000000000001020
52. Gu L, Shen C, Zhao L, et al. The relationship between fear of cancer recurrence and posttraumatic growth: A meta-analysis. *Frontiers in Psychology*. 2024; 15. doi: 10.3389/fpsyg.2024.1373102
53. Volz Y, Troost J, Eismann L, et al. The Burden of Fear of Cancer Recurrence in Genitourinary Cancers: A Prospective Study (NCT04535921). *Oncology Research and Treatment*. 2022; 45(12): 744–751. doi: 10.1159/000527161
54. Reed SC, Bell JF, Miglioretti DL, et al. Relationships Between Fear of Cancer Recurrence and Lifestyle Factors Among Cancer Survivors. *Journal of Cancer Education*. 2019; 35(4): 669–677. doi: 10.1007/s13187-019-01509-2