

# Prevalence and Factors Contributing to Fear of Recurrence in Breast Cancer Patients and Their Partners: A Cross-Sectional Study

Ling Tong<sup>1,2,\*</sup>, Yuan Wang<sup>1,2,\*</sup>, Dewu Xu<sup>3</sup>, Yibo Wu<sup>1</sup>, Ling Chen<sup>2</sup>

<sup>1</sup>Human Reproductive and Genetic Center, Affiliated Hospital of Jiangnan University, Wuxi, People's Republic of China; <sup>2</sup>Department of Breast Surgery, Affiliated Hospital of Jiangnan University, Wuxi, People's Republic of China; <sup>3</sup>Department of Medicine Education, Affiliated Hospital of Jiangnan University, Wuxi, People's Republic of China

\*These authors contributed equally to this work

Correspondence: Ling Chen, Department of Breast Surgery, Affiliated Hospital of Jiangnan University, Wuxi, 214062, People's Republic of China, Email [Rainbow\\_lyn@163.com](mailto:Rainbow_lyn@163.com); Yibo Wu, Human Reproductive and Genetic Center, Affiliated Hospital of Jiangnan University, Wuxi, 214062, People's Republic of China, Email [moliaty@aliyun.com](mailto:moliaty@aliyun.com)

**Objective:** The fear of cancer recurrence (FCR) is a generalized psychological problem among cancer patients and their spouses. The purpose of this study is to investigate the current status of cancer recurrence fear among breast cancer patients and their spouses, as well as its predictive factors.

**Methods:** A total of 155 breast cancer patients and their partners between March 2022 to Feb 2023 were selected from Affiliated Hospital of Jiangnan University. The survey was investigated by fear of progression questionnaire-short form (FoP-Q-SF), fear of progression questionnaire-short form for partners (FoP-Q-SF/P), family resilience questionnaire (FaRE), and health literacy management scale (HeLMS). Predictors were assessed using univariate and multivariable regression analyses.

**Results:** 52.9% (n=82) of breast cancer patients and 51.6% (n=80) of their spouses experienced high levels of fear of cancer recurrence (FCR). There was a positive correlation between the FCR of the patients and their spouses, while family resilience and health literacy were statistically significant negative predictive factors for breast cancer patients' fear of cancer recurrence.

**Conclusion:** In summary, the study found that the partner's FCR, health literacy and family resilience were closely related to the FCR in breast cancer patients. Therefore, healthcare workers can reduce the patient's FCR by reducing the FCR in spouses, improving patients' health literacy and family resilience in the future. In practical application, these findings hold significant implications for developing comprehensive care plans and interventions targeting FCR in breast cancer patients. By focusing on patients' partners and providing appropriate support and resources, healthcare professionals can promote patients' psychological well-being and overall health, leading to improved quality of life.

**Keywords:** breast cancer, family factors, fear recurrence, health literacy

## Introduction

Breast cancer is the leading cause of cancer deaths in women.<sup>1</sup> In recent years, with the improvement of medical technology and increased awareness of breast cancer self-examination, the prolonged survival for breast cancer patients. However, Research has shown that many cancer survivors experience persistent fear of cancer recurrence (FCR), and the long-term uncertainty of their health status during and after cancer treatment can be a significant psychological burden.<sup>2</sup> Fear of cancer recurrence (FCR) refers is the term for the psychological state in which cancer survivors are concerned and afraid of cancer recurrence, progression, or metastasis at the primary site. It is the most common social and psychological problem reported by breast cancer survivors and their partners.<sup>2</sup> Several studies revealed that 42% to 70% of breast cancer patients experienced a high level of FCR, which FCR does not disappear with time in breast cancer patients.<sup>3,4</sup>

Fear of cancer recurrence not only generates negative emotions in patients but can also lead to ineffective interpersonal relationships, family breakdown, and an inability to fulfill normal family responsibilities, causing serious negative impacts on both the patient and their spouse.<sup>5</sup> Additionally, the study by Jeppesen et al indicates that FCR can lead to excessive utilization of healthcare services, further burdening societal resources. Therefore, understanding and addressing the impact of FCR on patients, families, and society is crucial. Family resilience is a positive force that can positively support family members in coping with adversity, reduces the harmful effects of stress on individual health, and plays an important moderating role in responding to family crises. Shirou Mao and his partners proposed a family resilience model to explore the influencing factors of FCR and found that it is a potential way to reduce FCR in cancer survivors and family caregivers.<sup>6</sup> Moreover, health literacy refers to the ability to develop knowledge, skills, and confidence to develop and maintain healthy lifestyles and living conditions on a personal, and is an important predictor to improve health behaviors and outcomes for cancer patients.<sup>7</sup> Meanwhile, limited health literacy was identified as an independent influencing factor for FCR.<sup>8</sup> However, the relationship between family resilience, spouse's FCR, cancer health literacy and breast cancer patients' FCR is not clear. Therefore, the purpose of this study is to investigate the levels of FCR in breast cancer patients and their partners and reveal its correlation with the FCR of spouse, family resilience and cancer health literacy, providing a theoretical basis for psychological intervention of cancer recurrence for patients in the future.

## Methods

### Participants and Measures

This study was approved by the Ethics Committee of Jiangnan University Hospital. (JNMS01202101125). The convenience sampling method was used for the study. During the study period from Mar 2022 to Feb 2023, breast cancer patients were enrolled in the Affiliated Hospital of Jiangnan University. Patient inclusion criteria were: (1) previously diagnosed by a clinicopathological histological with breast cancer; (2) clear consciousness, good reading, and communication skills in Chinese; (3) age  $\geq 18$  years; (4) all subjects were female and married; (5) consent and voluntary participation in research. To further include the evaluation of their spouses: married and living with patients. We excluded patients who have occurred recurrence or metastasis, and were diagnosed with other complications, psychological or cognitive impairment. Finally, the final sample comprised 155 patients with breast cancer and their partners. This study has obtained informed consent from patients and their families.

We conducted a survey on both patients and their partners. Four questionnaires were completed by all patients (face-to-face), which included collecting personal information, fear of cancer recurrence, family resilience, and health literacy. Their spouses completed an FCR survey questionnaire. In addition, this study also collected clinical data, including the patient's current treatment methods, surgical approach, and disease staging.

### Instruments

- (1) We collected socio-demographic characteristics, including age, marital status, educational level, surgical procedure, body mass index, payment methods for medical expenses, and disease stage through a self-designed questionnaire.
- (2) Fear of progression questionnaire-short form (FoP-Q-SF): the table is simplified by 12 items from the original scale of 43 items. It was used to investigate the degree of fear progression in Chinese breast cancer patients.<sup>9</sup> Translated by Wu and others in China. The tool consists of two dimensions, including physiological well-being (6 items) and social/family (6 items), and the total score is the sum of the points of the 12 items, ranging from 1 ("never") to 5 ("always"), thus, the total score ranges between 12 and 60 points, with the higher scores, the more severe the level of FCR; a total score of  $\geq 34$  points indicates that the subject has a high level of FCR. The scale has been widely used in cancer patients because of its good reliability and validity.<sup>10</sup> The Cronbach's alpha coefficient of the scale for the Chinese version was 0.883, with good reliability and validity.<sup>11</sup>
- (3) Fear of progression questionnaire-short form for partners (FoP-Q-SF/P) was measured with the fear of recurrence in spouses of breast cancer patients, and is the only instrument currently available for evaluating partners' FCR.

The tool was developed by Zimmermann on the basis of FoP-Q-sf; thus, an overall score of  $\geq 34$  points showed that spouses have a high level of FCR, similarly.<sup>12</sup> The Chinese edition of the scale had a Cronbach's alpha coefficient of 0.834.<sup>13</sup>

- (4) Family resilience was assessed using the family resilience questionnaire (FaRE), which was translated by Mengmeng Li based on the Walsh family elasticity model. A total of 24 items were included in four dimensions: communication and cohesion, perception of social support, perception of family coping, and religious beliefs. Likert 7-grade rating system was adopted ranging from 1 (very agree) to 7 (very disagree), a higher total score indicated higher levels of family resilience. The questionnaire was acceptable and had good reliability and validity for breast cancer patients in China. Cronbach's questionnaire  $\alpha$  The coefficient is 0.909.<sup>14</sup>
- (5) The Health Literacy Management Scale (HeLMS) for chronic disease patients was developed by Jordan et al at the University of Melbourne in Australia. It was updated and rendered into the Chinese language by Sun Haolin et al. The measure consists of four dimensions: access to the information (9 entries), exchange and interaction (9 entries), intention to improve health (4 entries), and intention to support financially (2 entries), for a total of 24 entries. Total points vary from 24 to 120, with the higher scores demonstrating the higher the patient's perceived state of healthy literacy.<sup>15</sup> The scale Cronbach's  $\alpha$  0.894.

## Ethics

The research was authorized by the Ethics Committee of the Affiliated Hospital of Jiangnan University (JNMS01202101125). This study was conducted in accordance with the guidelines of the Declaration of Helsinki. The researchers obtained support from their hospital and department and selected study subjects strictly according to the inclusion and exclusion criteria. Before the survey, the purpose, significance, and content of the investigation were explained to the study subjects and their spouses. Trained investigators used uniform questionnaires and conducted face-to-face surveys to collect information from the participants.

## Statistical Analysis

The statistical analysis was carried out by utilizing SPSS 26.0. Qualitative data were presented as frequencies and percentages, and quantitative data were presented as mean  $\pm$  standard deviation ( $x \pm s$ ). Independent samples *t*-test, nonparametric rank sum test, or ANOVA were used to make comparisons of differences between groups. Pearson correlation analysis was used to explore the correlation between breast cancer patients' fear of cancer recurrence and their health literacy, family resilience, and their spouses' fear of cancer recurrence. The influence of fear of cancer recurrence among breast cancer patients was determined using multiple linear regression analysis. *p*-value less than 0.05 was regarded as a statistically significant.

## Results

### Clinical Features and Demographics

The 155 patients ranged in age from 30 to 81 years, with a mean age of 53.92 (SD=10.66), 74.2% (n=115) of the patients were younger than 60 years old, and 25.8% (n = 40) of the patients were older than 60 years old. 65.8% (n=102) of the patients were retired, and the others were employed. Among patients, 18.7% (n=29) had a college degree or higher. [Table 1](#) shows illustrative statistics and correlations among specific demographic data, clinical characteristics, and FCR.

### FCR, Family Resilience and Health Literacy Scores for All Participants

The finding showed that 52.9% (n=82) of patients and 51.6% (n=80) of spouses experienced high levels of FCR. The mean family resilience score was 109.96 (SD=19.74) in 155 patients with breast cancer, with a mean score of 41.83 (SD=7.62) for communication and cohesion, 38.21 (SD=8.72) for social support perception, 21.55 (SD=3.86) for family coping perception, and religious belief 8.26 (SD=4.68) in the sub-population. Among 155 participants, the mean score of health literacy was 95.81 (SD=11.78), with the mean item scores of access to information, communication and interaction skills, willingness to make health improvements, and willingness to financially support being 50.63 (SD=5.18), 14.59 (SD=4.76), 13.86 (SD=4.24) and 16.72 (SD=2.24), respectively ([Table 2](#)).

**Table 1** Univariate Analysis of FCR in Breast Cancer Patients

Parameter	Group	N=155	FCR (Mean ± Standard Deviation)	F/Z/K	P
Age (year)	<60	115	33.59±6.94	-2.254	<b>0.024</b>
	≥60	40	30.60±7.40		
BMI (kg/cm <sup>2</sup> )	<25	107	32.92±7.20	-0.612	0.540
	≥25	48	32.60±7.12		
Current working status	Processing	102	32.66±7.04	0.088	0.767
	Retirement	53	33.13±7.43		
Educate	Primary school and below	19	35.26±7.57	1.072	0.363
	Elementary school	70	32.17±7.40		
	High school	37	32.30±6.79		
	College degree or above	29	33.45±6.76		
Medical Payment Method	New rural cooperative medical	42	33.50±8.18	1.218	0.305
	Urban Residents	59	33.54±5.90		
	Urban Workers	52	31.33±7.46		
	Self-pay	2	36.00±9.90		
Surgical method	Breast conserving surgery	58	33.38±7.09	3.369	0.498
	Radical mastectomy	10	29.70±6.26		
	Breast modified operation	35	33.63±6.97		
	Simple resection	43	32.14±7.735		
Cancer stages	I	18	32.11±6.12	0.940	0.625
	II	95	33.21±6.98		
	III	42	32.24±8.01		
Current treatment	Chemotherapy	114	32.39±3.37	-1.434	0.152
	Surgery	41	34.00±6.47		

**Note:** Bold font represents statistically significant P-values.

**Abbreviation:** FCR, fear of cancer recurrence.

**Table 2** Specific Descriptive Analyses of FCR, Family Resilience and Health Literacy Scores are Presented

Parameter	Score Range	Average ± SD
Patient FCR	14–52	32.82±7.16
Partner FCR	16–46	33.06±7.42
Family resilience	64–146	109.96±19.74
Communication and cohesion	23–56	41.83±7.62
Social support perception	18–56	38.21±8.72
Family coping perception	8–30	21.55±3.86
Religious belief	4–28	8.26±4.68
Health literacy	49–119	95.81±11.78
Information acquisition ability	29–58	50.63±5.18
Communication and interaction ability	5–25	14.59±4.76
Willingness to improve health	4–20	13.86±4.24
Willingness to financially support	9–25	16.72±2.24

**Abbreviation:** FCR, fear of cancer recurrence.

## The Correlations Between Family Resilience, Health Literacy, and Participant FCR

Pearson correlations were used to evaluate the existence of a relationship between the partner's FCR, health literacy, and family resilience and the patient's FCR. The result indicated that the patient's FCR was positively related to the partner's FCR, and negatively correlated to health literacy and family resilience (Table 3).

**Table 3** Association Between Partner FCR, Family Resilience, Health Literacy and FCR in Breast Cancer Patients

	Patient's FCR	Partner's FCR	Family Resilience	Health Literacy
Patient's FCR	1	0.678**	-0.534**	-0.538**
Partner's FCR	0.678**	1	-0.399**	-0.476**
Family resilience	-0.534**	-0.399**	1	0.635**
Health literacy	-0.538**	-0.476**	0.635**	1

Note: \*\* $p < 0.01$ .

Abbreviation: FCR, fear of cancer recurrence.

## Multivariate Linear Regression Analysis of Factors That Affect FCR in Breast Cancer Patients

Using the FoP-Q-SF of breast cancer patients as the dependent variable, Multiple linear regression was analyzed using the variables of interest and those statistically significant in the univariate analysis as independent variables. The results indicated that age, family resilience, health literacy and spousal fear of cancer recurrence were predictors of fear of cancer recurrence among breast cancer patients, while a higher level of family resilience and health literacy were protective factors for fear of cancer recurrence among breast cancer patients. These variables represented 55.4% of the variance and the results of the analysis were found to be scientifically meaningful ( $F(4|150)=48.797$ ,  $P < 0.001$ ) (Table 4).

## Discussion

The finding of this study showed that the mean FCR score was  $32 \pm 7.16$ , and 52.9% experienced high levels of FCR in 155 breast cancer patients, which was similar to the results of Hong et al.<sup>16</sup> However, we found that it was a higher incidence than the rate of FCR reported by Cristiane Decant Bergerot and Man Liu for prostate cancer and non-small cell lung cancer, respectively.<sup>17,18</sup> This phenomenon could be related to the investigated population, treatment stage and type of cancer. Simultaneously, most of the study subjects were hospitalized breast cancer patients who were prone to fatigue and other symptoms during this period, resulting in slightly higher levels of FCR. One study found that high levels of FCR will reduce the quality of life and survival rate for cancer survivors.<sup>19</sup> The above results indicated that psychological nursing for patients with breast cancer faces greater challenges compared with other cancer patients, suggesting that medical professionals need to pay further focus on FCR levels and provide timely psychological support to reduce FCR levels in breast cancer patients.

Our findings showed that age was significantly and negatively correlated with FCR levels, and the younger the age, the greater the FCR levels, which is in accordance with the results of prior studies,<sup>20,21</sup> and whose reason was that young cancer patients often take more domestic and social responsibility, feeling like a burden on the whole family due to their illness.<sup>22</sup> Therefore, during treatment and care, healthcare providers should give more attention to the psychological rehabilitation of young patients.

**Table 4** Multiple-Linear Regression Analysis for Influencing Factors of FCR in Breast Cancer Patients

Variable	B	Sx	T	P
Constant	36.260	4.988	7.270	<b>0.000</b>
Age	-1.843	0.897	-2.056	<b>0.042</b>
Family resilience	-0.083	0.026	-3.245	<b>&lt;0.001</b>
Health literacy	-0.100	0.045	-2.208	<b>0.029</b>
Partner's FCR	0.475	0.061	7.841	<b>&lt;0.001</b>

Notes:  $R^2=0.565$   $R_{adj}=0.554$   $F=48.797$   $P < 0.001$ . Bold font represents statistically significant  $P$ -values.

Abbreviation: FCR, fear of cancer recurrence.

In this research, we found that family resilience was inversely associated with patient's FCR, indicating that better family resilience contributed to lower levels of FCR in patients with breast cancer. Family resilience was used to measure family members' resistance to stress, including family cooperation ability, confidence in dealing with problems, attitude towards current experiences, and sense of control over family life.<sup>23</sup> It has been demonstrated family member's stress can be relieved by family resilience which will positively affect the individual psychological flexibility, excite the individual's underlying cognitive and psychological traits, and stimulate body immunity.<sup>24,25</sup> So, individual resilience can be influenced by family resilience that adjusting individual physical and mental health is to change the patient's evaluation of situation, reducing the levels of FCR in cancer patients. Moreover, in the study investigating the levels of FCR in spouses of breast cancer patients, we also found that concern about cancer recurrence was not only observed in breast cancer patients, 51.6% of couples of breast cancer patients had a high level of fear of cancer relapse. The findings are consistent with prior research.<sup>26–28</sup> That is, FCR is not only limited to patients but also affects their spouses. Research has shown that the FCR in breast cancer patients can potentially impact the emotional well-being of their spouses. Spouses often share a deep emotional bond with the patients and resonate with their fears and anxieties. The patients' fear of cancer recurrence can be transmitted to their spouses, causing psychological pressure and concerns. Therefore, when we develop nursing measures to help breast cancer patients to overcome the fear of recurrence, it is not only to carry out active intervention for patients but also enhance family resilience and pay attention to the psychological state of their spouses to reduce levels of FCR in patients.

Finally, we observed that there was an inverse association between health literacy and FCR. Several research indicated that patients with low health literacy has lower awareness in potential adverse effects of cancer therapy, which impacts therapeutic efficacy and compliance;<sup>29–31</sup> at the same time, poor health literacy patients more often lack knowledge of health literacy, resulting in failing to correctly understand the prognosis of treatment options and the probability of recurrence, which may lead to overestimation of their risk of recurrence.<sup>32</sup> Thus, it is necessary to strengthen the health education of patients, improve the health literacy level, promote their health behaviors, and then reduce the levels of FCR for patients who breast cancer in clinical work.

## Study Limitations

There are some limitations to the present research. First, the cross-cutting survey design used in this study cannot establish the trajectory of fear of cancer recurrence levels in breast cancer patients over time. Second, participants' FCR, health literacy and family resilience were self-report survey data, which could be susceptible to recall bias. Finally, although the study population involved the Breast Surgery of the Affiliated Hospital of Jiangnan University, who came from all over the country and were representative, there were certain limitations in the current treatment and care environment. Therefore, we will conduct multicenter studies and expand the sample size in the future.

## Conclusion

In summary, the study found that the partner's FCR, health literacy and family resilience were closely related to the FCR in breast cancer patients. Therefore, healthcare workers can reduce the patient's FCR by the reducing the FCR in spouses, improving patients' health literacy and family resilience in the future. In practical applications, these findings hold significant importance for developing comprehensive care plans and intervention measures targeting FCR in breast cancer patients. This allows healthcare professionals to promote patients' psychological well-being and overall health, thereby improving their quality of life.

## Data Sharing Statement

Upon reasonable request, communicating the first author Ling Tong may present data in favor of the results of this research.

## Consent to Publish

The authors affirm that human research participants provided informed consent for publication.

## Author Contributions

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

## Funding

This research was funded by the Support Scheme for Young and Middle-aged Top Talents of Wuxi Municipal Health and Family Planning Commission (BJ2020047), Wuxi Taihu Lake Talent Plan, Supports for Leading Talents in Medical and Health Profession (Mading academician, 4532001THMD), Beijing Bethune charitable Foundation (2022-YJ-085-J-Z-ZZ-011).

## Disclosure

The authors report no conflicts of interest in this work.

## References

- Xia C, Dong X, Li H, et al. Cancer statistics in China and United States, 2022: profiles, trends, and determinants. *Chin Med J*. 2022;135(5):584–590. doi:10.1097/CM9.0000000000002108
- Thewes B, Butow P, Zachariae R, Christensen S, Simard S, Gotay C. Fear of cancer recurrence: a systematic literature review of self-report measures. *Psychooncology*. 2012;21(6):571–587. doi:10.1002/pon.2070
- Shim EJ, Jeong D, Lee SB, Min YH. Trajectory of fear of cancer recurrence and beliefs and rates of medication adherence in patients with breast cancer. *Psychooncology*. 2020;29(11):1835–1841. doi:10.1002/pon.5497
- Tran T, Jung SY, Lee EG, et al. Fear of cancer recurrence and its negative impact on health-related quality of life in long-term breast cancer survivors. *Cancer Res Treat*. 2022;54(4):1065–1073. doi:10.4143/crt.2021.835
- Zhang X, Sun D, Qin N, Liu M, Jiang N, Li X. Factors correlated with fear of cancer recurrence in cancer survivors: a meta-analysis. *Cancer Nurs*. 2022;45(5):406–415. doi:10.1097/NCC.0000000000001020
- Mao S, Lu H, Zhang Y, et al. Evaluation of psychosocial pathways to family adaptation of Chinese patients with liver cancer using the mccubbin's family resilience model. *Front Psychiatry*. 2021;12:703137. doi:10.3389/fpsy.2021.703137
- Cartwright LA, Dumenci L, Cassel JB, Thomson MD, Matsuyama RK. Health literacy is an independent predictor of cancer patients' hospitalizations. *Health Lit Res Pract*. 2017;1(4):e153–e162. doi:10.3928/24748307-20170808-01
- Halbach SM, Enders A, Kowalski C, et al. Health literacy and fear of cancer progression in elderly women newly diagnosed with breast cancer--A longitudinal analysis. *Patient Educ Couns*. 2016;99(5):855–862. doi:10.1016/j.pec.2015.12.012
- Mehnert A, Herschbach P, Berg P, Henrich G, Koch U. [Fear of progression in breast cancer patients--validation of the short form of the Fear of Progression Questionnaire (FoP-Q-SF)]. *Z Psychosom Med Psychother*. 2006;52(3):274–288. German. doi:10.13109/zptm.2006.52.3.274
- Hinz A, Mehnert A, Ernst J, Herschbach P, Schulte T. Fear of progression in patients 6 months after cancer rehabilitation-a validation study of the fear of progression questionnaire FoP-Q-12. *Support Care Cancer*. 2015;23(6):1579–1587. doi:10.1007/s00520-014-2516-5
- Wu Q, Ye Z, Li LI, Liu P. 癌症患者恐惧疾病进展简化量表的汉化及信效度分析. Reliability and validity of Chinese version of fear of progression questionnaire-short form for cancer patients. *中华护理杂志 [Chin J Nurs]*. 2015;50(12):1515–1519.
- Zimmermann T, Herschbach P, Wessarges M, Heinrichs N. Fear of progression in partners of chronically ill patients. *Behav Med*. 2011;37(3):95–104. doi:10.1080/08964289.2011.605399
- Wu Q. The status research and study on Fear of Progression of Primary Liver Cancer patients and their spouses; 2016: 6.
- Li M, Ma R, Zhang S, et al. Reliability and validity of the Chinese version of the Family Resilience Questionnaire (FaRE Questionnaire) in patients with breast cancer: a cross-sectional study. *BMJ Open*. 2022;12(4):e051093. doi:10.1136/bmjopen-2021-051093
- Jordan JE, Buchbinder R, Briggs AM, et al. The health literacy management scale (HeLMS): a measure of an individual's capacity to seek, understand and use health information within the healthcare setting. *Patient Educ Couns*. 2013;91(2):228–235. doi:10.1016/j.pec.2013.01.013
- Hong SJ, Shin NM. Fear of cancer recurrence in Korean women after breast cancer treatment: a mixed methods study. *Eur J Oncol Nurs*. 2021;54:102010. doi:10.1016/j.ejon.2021.102010
- Bergerot CD, Williams SB, Klaassen Z. Fear of cancer recurrence among patients with localized prostate cancer. *Cancer*. 2021;127(22):4140–4141. doi:10.1002/cncr.33837
- Liu M, Liu L, Zhang S, Li T, Ma F, Liu Y. Fear of cancer recurrence and hope level in patients receiving surgery for non-small cell lung cancer: a study on the mediating role of social support. *Support Care Cancer*. 2022;30(11):9453–9460. doi:10.1007/s00520-022-07318-6
- Ellis S, Brown RF, Thorsteinsson EB, Pakenham KI, Perrott C. Quality of life and fear of cancer recurrence in patients and survivors of non-Hodgkin lymphoma. *Psychol Health Med*. 2022;27(8):1649–1660. doi:10.1080/13548506.2021.1913756
- Mahendran R, Liu J, Kuparasundram S, et al. Fear of cancer recurrence among cancer survivors in Singapore. *Singapore Med J*. 2021;62(6):305–310. doi:10.11622/smedj.2020007
- Richter D, Clever K, Mehnert-Theuerkauf A, Schönfelder A. Fear of recurrence in young adult cancer patients-a network analysis. *Cancers*. 2022;14(9):2092. doi:10.3390/cancers14092092
- Vandraas KF, Reinertsen KV, Kiserud CE, Lie HC. Fear of cancer recurrence among young adult cancer survivors-exploring long-term contributing factors in a large, population-based cohort. *J Cancer Surviv*. 2021;15(4):497–508. doi:10.1007/s11764-020-00943-2

23. Persson C, Benzein E, Årestedt K. Assessing family resources: validation of the Swedish version of the Family Hardiness Index. *Scand J Caring Sci.* 2016;30(4):845–855. doi:10.1111/scs.12313
24. Connor KM, Davidson JR. Development of a new resilience scale: the Connor-Davidson Resilience Scale (CD-RISC). *Depress Anxiety.* 2003;18(2):76–82. doi:10.1002/da.10113
25. Dantzer R, Cohen S, Russo SJ, Dinan TG. Resilience and immunity. *Brain Behav Immun.* 2018;74:28–42. doi:10.1016/j.bbi.2018.08.010
26. Wu LM, McGinty H, Amidi A, Bovbjerg K, Diefenbach MA. Longitudinal dyadic associations of fear of cancer recurrence and the impact of treatment in prostate cancer patients and their spouses. *Acta Oncol.* 2019;58(5):708–714. doi:10.1080/0284186X.2018.1563714
27. Soriano EC, Otto AK, LoSavio ST, Perndorfer C, Siegel SD, Laurenceau JP. Fear of cancer recurrence and inhibited disclosure: testing the social-cognitive processing model in couples coping with breast cancer. *Ann Behav Med.* 2021;55(3):192–202. doi:10.1093/abm/kaaa043
28. Petricone-Westwood D, Stragapede E, Galica J, Hales S, Lebel S. An investigation of fear of recurrence, attachment and caregiving experiences among ovarian cancer partner-caregivers. *Psychooncology.* 2022;31(7):1136–1143. doi:10.1002/pon.5901
29. Turkoglu AR, Demirci H, Coban S, et al. Evaluation of the relationship between compliance with the follow-up and treatment protocol and health literacy in bladder tumor patients. *Aging Male.* 2019;22(4):266–271. doi:10.1080/13685538.2018.1447558
30. Galvin AM, Garg A, Matthes S, Thompson EL. Utilizing a multidimensional health literacy framework to assess cervical cancer screening nonadherence. *Health Educ Behav.* 2021;48(5):710–718. doi:10.1177/10901981211001851
31. Xiao L, Miao J, Peng M, et al. The effect of health literacy on patient's perceived shared decision-making among Chinese cancer patients. *Psychooncology.* 2022;31(1):70–77. doi:10.1002/pon.5777
32. Clarke N, Dunne S, Coffey L, et al. Health literacy impacts self-management, quality of life and fear of recurrence in head and neck cancer survivors. *J Cancer Surviv.* 2021;15(6):855–865. doi:10.1007/s11764-020-00978-5

International Journal of Women's Health

Dovepress

## Publish your work in this journal

The International Journal of Women's Health is an international, peer-reviewed open-access journal publishing original research, reports, editorials, reviews and commentaries on all aspects of women's healthcare including gynecology, obstetrics, and breast cancer. The manuscript management system is completely online and includes a very quick and fair peer-review system, which is all easy to use. Visit <http://www.dovepress.com/testimonials.php> to read real quotes from published authors.

Submit your manuscript here: <https://www.dovepress.com/international-journal-of-womens-health-journal>