



## ARTICLE

# Research on the Association between Fear of Cancer Recurrence in Young Breast Cancer Patients and Adult Attachment and Self-Disclosure

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## ABSTRACT

**Background:** Although fear of cancer recurrence (FCR) is the most important factor affecting the life quality of young breast cancer patients, and it may be affected by the patient's personality, marital relationship and communication, there is a lack of research on the relationship between adult attachment, self-disclosure and FCR in patients. This study investigated the current situation of FCR in young breast cancer patients, its correlation with adult attachment and self-disclosure and its influencing factors, in order to predict the impact of adult attachment and self-disclosure of patients to spouse on FCR. **Methods:** A survey was conducted on 126 breast cancer patients at our hospital using the General Information Questionnaire (GIQ), Fear of Progression Questionnaire-Short Form (FoP-Q-SF), Experiences in Close Relationships inventory (ECR), and Distress Disclosure Index (DDI). The study analyzed the status of FCR among young breast cancer patients and its correlation with adult attachment and self-disclosure, along with its influencing factors. **Results:** Among the 126 young breast cancer patients, 50 had a FoP-Q-SF score <34 (normal group), while 76 had a FoP-Q-SF score  $\geq 34$  (FCR positive group), with an FCR incidence rate of 60.32%. Univariate analysis showed statistically significant differences between the two groups in terms of FoP-Q-SF score, ECR score, attachment anxiety score, attachment avoidance score, DDI score, age, educational level, employment status, per capita monthly income, and treatment method ( $p < 0.05$ ). Correlation analysis revealed that FoP-Q-SF scores were positively correlated with attachment anxiety score, attachment avoidance score, ECR scores and negatively correlated with DDI scores ( $p < 0.05$ ). Linear regression analysis indicated that age, per capita monthly income, treatment method, attachment anxiety, attachment avoidance and self-disclosure level were negative predictors of FoP-Q-SF scores in young breast cancer patients ( $p < 0.05$ ). **Conclusion:** The incidence rate of FCR among young breast cancer patients is high. There is a positive correlation between adult attachment and the level of FCR, and a negative correlation between the level of self-disclosure and FCR. Patients with lower per capita monthly income, more complex treatment methods, higher level of attachment anxiety, higher level of attachment avoidance and lower DDI scores had higher FoP-Q-SF scores.

## KEYWORDS

Breast cancer; fear of recurrence; adult attachment; self-disclosure

## Introduction

Breast cancer, a malignant tumor originating from ductal or mammary epithelium [1], is one of the most common malignancies in women [2]. According to the World Health

Organization's International Agency for Research on Cancer statistics from 2020, there were 2.26 million new cases of breast cancer globally [3], with a trend towards younger age at diagnosis. It is reported that up to 18.8% of patients are under the age of 40 [4]. With the continuous development



of medical technology, including surgery, radiotherapy, and chemotherapy, the number of breast cancer survivors in China is gradually increasing [5]. However, studies have shown that the recurrence rate within three years post-surgery can still reach about 30% [6]. Fear of Cancer Recurrence (FCR) has become the most severe factor affecting the mental health of breast cancer patients. FCR refers to the anxiety caused by the fear of cancer progression or recurrence [7,8]. A survey indicate that the incidence of FCR in young breast cancer patients can be as high as 80% [9], which can severely affect their mental health and quality of life. This may cause patients to lose confidence in their treatment, leading to poor prognosis.

Another factor associated with the physical and mental health and quality of life of breast cancer patients is adult attachment [10–12]. Study has shown that breast cancer patients with different types of attachment exhibit differences in seeking help, expressing emotions, and perceiving their illness. These differences significantly impact psychological adjustment, intimate relationships, and patient prognosis for both the patients and their spouse or primary caregivers [13]. A study from Hungary [14] proved that high attachment anxiety and high attachment avoidance in breast cancer patients reflect low relationship satisfaction and sexual satisfaction, and monitoring and adjusting patients' physical, psychological and personality characteristics may help improve patients' quality of life, thereby reducing patients' FCR. Patients with avoidant attachment tend to avoid discussing their illness and emotional issues, leading to an accumulation of FCR. On the other hand, patients with anxious attachment excessively rely on the support of others, and when they perceive a lack of support, their FCR significantly increases [15].

Self-disclosure can also have an impact on patients' psychology and quality of life. Zhao et al. [16] believed that self-disclosure is the process through which individuals share their thoughts, feelings, and experiences with others, serving as an effective psychological therapy to obtain social support and alleviate negative emotions [16]. In marital relationships, self-disclosure helps both partners better understand and support each other, enhancing the quality of the marriage. A good marital relationship and partner support have a positive impact on alleviating the fear of cancer recurrence in breast cancer patients. However, due to various reasons such as Chinese young women being ashamed to talk about breasts and bearing the burden of family, they suppress their self-disclosure, thus suppressing the negative emotions of FCR in their hearts and cannot be properly relieved [17]. Soriano et al. [18] found that communication style induced suppression of self-disclosure in patients and spouses was associated with high levels of fear of cancer recurrence. Therefore, actively encouraging and supporting breast cancer patients to engage in self-disclosure is of great significance for alleviating FCR, improving mental health, and enhancing the quality of life [19].

This is a single-center retrospective study, aims to analyze the current state of FCR among young breast cancer patients, its influencing factors, and its correlation with adult attachment and self-disclosure. This could help clinical

medical staff to use psychological interventions which is compatible with Chinese marriage mode to improve the intimate relationships between patients and their spouses, reduce patients' FCR, enhance treatment confidence, increase social support, and improve treatment compliance.

## Materials and Methods

### General information

A total of 126 young breast cancer patients (They are all female and married) who received inpatient treatment in the breast tumor department of Jiangsu Cancer Hospital from January 2022 to January 2023 were selected as the study subjects. The average age of the patients was  $(33.16 \pm 3.40)$  years. Other general information is presented in Table 1. The patients were surveyed using general information questionnaires (GIQ), the Fear of Progression Questionnaire-Short Form (FoP-Q-SF), the Experiences in Close Relationships Scale (ECR), and the Distress Disclosure Index (DDI). Based on the assessment results of the FoP-Q-SF, patients were divided into a normal group and an FCR-positive group.

Inclusion criteria: (1) Pathologically diagnosed with breast cancer. (2) Patients were informed about the study and signed a consent form. (3) Age  $\geq 20$  years and  $\leq 40$  years. (4) Conscious and able to complete the questionnaire either in writing or orally. Exclusion criteria: (1) Patients with other severe diseases. (2) Patients who have had or are combined with other tumors. (3) Patients with cancer recurrence or metastasis. (4) Patients with incomplete data or those who withdrew from the study midway.

## Research Tools

### General information questionnaire

A self-designed questionnaire was used to collect the basic information of the patients, including age ( $<30$  years old, 30–40 years old), employment status (unemployed, employed), place of residence (rural, urban), family average monthly income ( $<5000$  RMB/month, 5000–8000 RMB/month,  $>8000$  RMB/month), medical insurance status (self-paid, insured), treatment method (surgery + chemotherapy + radiotherapy+ endocrine therapy, surgery + chemotherapy + endocrine therapy, surgery + endocrine therapy), duration of illness ( $<1$  year, 1–2 years,  $>3$  years), and number of children ( $\geq 3$ , 2, 1, 0) (Table A1).

### Fear of progression questionnaire-short form (FoP-Q-SF)

This questionnaire is designed to measure the multidimensional fear of recurrence in breast cancer patients (Table A2) [20]. It consists of 12 items divided into two dimensions: physical health and social-family. It uses a Likert 5-point scoring system, ranging from “never” to “always”, with total scores ranging from 12 to 60. Higher scores indicate higher levels of fear of recurrence. A score of  $\geq 34$  points is considered positive for fear of cancer recurrence. The scale has a Cronbach's alpha coefficient of 0.856, with dimension-specific Cronbach's alpha coefficients of 0.838 and 0.842, indicating good reliability and validity.

TABLE 1

## General data of young patients with breast cancer

	Variable	n	%
Age (years)	<30	19	15.08
	30~40	107	84.92
Educational level	Primary school and below	7	5.56
	Middle school-high school	35	27.78
	College or above	84	66.67
Employment status	Unemployed	22	17.46
	Employed	104	82.54
Place of residence	Urban	23	18.25
	Rural	103	81.75
Family average monthly income (RMB)	<5000	43	34.13
	5000~8000	55	43.65
	>8000	28	22.22
Medical insurance status	Self-paid	13	10.32
	Medical Insurance	113	89.68
Methods of treatment	Surgery + radiotherapy + chemotherapy + endocrine therapy	62	49.21
	Surgery + chemotherapy + endocrine therapy	62	49.21
	Surgery + endocrine therapy	2	1.59
Duration of illness	>3 years	6	4.76
	1~2 years	40	31.75
	<1year	80	63.49
Number of children	0	2	1.59
	1	41	32.54
	2	82	65.08
	≥3	1	0.79

*Experiences in close relationships inventory (ECR)*

This inventory is used to measure the adult attachment style in intimate relationships of breast cancer patients, focusing on the relationship between the patient and her husband. It is the most widely used universal scale in the field of marital attachment (Table A3) [21,22]. The inventory consists of 36 items, divided into two dimensions: attachment avoidance and attachment anxiety, with 18 items each. It employs a Likert 7-point scoring system, ranging from “strongly disagree” to “strongly agree” Higher scores indicate higher levels of attachment avoidance and attachment anxiety. The inventory has a Cronbach’s alpha coefficient of 0.756, with dimension-specific Cronbach’s alpha coefficients of 0.868 for attachment avoidance and 0.794 for attachment anxiety, indicating good reliability and validity.

*Distress disclosure index (DDI)*

This scale is used to measure the extent to which breast cancer patients disclose their inner distress or psychological troubles to their spouse (Table A4) [16]. It was introduced into China by Li et al. in 2009 and has been widely used [23]. There are 12 items in the scale, including two dimensions of self-disclosure and self-concealment, and each item adopts Likert 5-level

scoring method, from low to high, from “strongly disagree” to “strongly agree”, self-disclosure dimension is positive score, and self-concealment dimension is reverse score. The total score ranges from 12 to 60. The higher the score, the higher the willingness and degree of disclosure with others, among which 12 to 29 were low self-disclosure, 30 to 44 were medium self-disclosure, and 45 to 60 were high self-disclosure [24]. The scale has a Cronbach’s alpha coefficient of 0.866, indicating good reliability and validity.

*Survey method*

The survey was conducted by three researchers who had undergone uniform training to guide patients in filling out the questionnaires themselves. Before filling out the questionnaires, patients were informed of the purpose, significance, filling method, and precautions of the study, and were advised to answer based on their actual situations. The survey process was conducted in a private setting to avoid interference from others and to protect the privacy of the patients. If patients encountered questions they did not understand, the researchers explained patiently to avoid subjective and leading answers. If a patient’s response was unclear or uncertain, the researchers would ask repeatedly

to confirm the answer before it was recorded in the questionnaire. After completion, the researchers checked the questionnaires on the spot. The survey was conducted from January 2022 to January 2023. A questionnaire survey was conducted for each patient during the period when they were diagnosed with breast cancer and received surgery or chemoradiotherapy. A total of 137 questionnaires were distributed, and after excluding 11 invalid questionnaires (missing significant content), 126 valid questionnaires were collected.

#### Statistical methods

Data entry was performed using Excel software, and the data were imported into SPSS 26.0 software for processing and analysis. Breast cancer patients were divided into a fear of recurrence positive group and a normal group based on the FoP-Q-SF scores of  $\geq 34$  points. Categorical variables were presented as [n(%)], and comparisons between groups were made using the  $\chi^2$  test. Continuous variables were tested for normality; those conforming to a normal distribution were presented as ( $\bar{x} \pm s$ ) and compared using the *t*-test. Non-normal distributions were represented by [median (M25, M75)], and non-parametric tests were performed between groups. Correlation analysis between two continuous variables that followed a normal distribution was conducted using Pearson analysis, while Spearman analysis was used for bivariate correlation analysis of variables that did not follow a normal distribution. Linear regression analysis was conducted to analyze the risk factors affecting FoP-Q-SF in breast cancer patients. During the data analysis process, certain variables were excluded from the models based on the following criteria: (1) Multicollinearity: Variables that showed high multicollinearity (Variance Inflation Factor, VIF > 10) were excluded to ensure the stability and reliability of the regression models. (2) Non-significant predictors: Variables that did not show significant associations (*p*-value  $\geq 0.05$ ) in preliminary univariate analyses were excluded from the final multivariate models to simplify the models and improve their interpretability. A *p*-value of <0.05 was considered statistically significant.

## Results

#### *Univariate analysis of variables in the fear of recurrence positive group and normal group among young breast cancer patients*

Based on a FoP-Q-SF score of  $\geq 34$ , young breast cancer patients were divided into an FCR positive group (76 patients) and a normal group (50 patients), with an FCR incidence rate of 60.32%. There were no significant differences between the FCR positive group and the normal group in terms of place of residence, medical insurance status, duration of illness, and number of children (*p* > 0.05). Significant differences were observed in FoP-Q-SF scores, ECR scores, Attachment anxiety score, Attachment avoidance score, DDI scores, age, educational level, employment status, average monthly income per person, and treatment methods (*p* < 0.05), as shown in [Table 2](#).

#### *Correlation analysis between FoP-Q-SF Scores and ECR scores, DDI scores among young breast cancer patients*

According to the Pearson correlation analysis, the scores of the physical health dimension, the social-family dimension, and the total score of the FoP-Q-SF were significantly positively correlated with the scores of the attachment anxiety dimension, attachment avoidance dimension, and the total score of the ECR (*p* < 0.05 for all). At the same time, the scores of the physical health dimension, the social-family dimension, and the total score of the FoP-Q-SF were significantly negatively correlated with the DDI scores (*p* < 0.05). See [Table 3](#).

#### *Analysis of independent risk factors for fear of recurrence in young breast cancer patients*

For the categorical variables that showed significant differences in the univariate analysis between the FCR positive group and the normal group, dummy variables were set up, and continuous variables were entered in their original form, as shown in [Table 4](#). Linear regression analysis was utilized; the results indicated that age, average monthly income per person, treatment method, attachment anxiety, attachment avoidance, and self-disclosure were incorporated into the regression equation, suggesting that these six variables have an impact on the FoP-Q-SF scores of young breast cancer patients. The regression analysis model had a fit of  $R^2 = 0.543$  indicating that the age, average monthly income per person, treatment method, attachment anxiety, attachment avoidance and DDI scores could explain 54.3% of the variance in FoP-Q-SF scores. ANOVA analysis of the regression equation was significant ( $F = 12.330$ , *p* < 0.001), as shown in [Table 5](#).

## Discussion

Patients experiencing fear of cancer recurrence during treatment may feel burdened, develop negative and apathetic attitudes towards self-management, and encounter challenges in their marital relationships. In severe cases, this can even lead to suicidal tendencies [25,26]. It is crucial for clinical medical staff to monitor patients' FCR and provide timely and effective interventions.

In this study, the incidence of FCR (60.32%) in young breast cancer patients was slightly higher than that reported by Guo et al. [27], which was 53.8%. This discrepancy may be attributed to the fact that the participants in this study were all under 40 years old. Younger individuals often bear the responsibility of supporting their families, making a cancer diagnosis more unexpected and difficult to accept compared to the elderly. Some studies have indicated that FCR in breast cancer patients decreases with age [28]. Further linear regression analysis in this study included age as a variable, showing that it impacts the FCR score. The findings suggest that the younger the breast cancer patient, the more severe the FCR.

In addition to age, per capita monthly income and treatment methods are also factors affecting FCR in young breast cancer patients. Per capita monthly income is a negative predictor of FoP-Q-SF, indicating that lower per capita monthly income is associated with more severe FCR.

TABLE 2

Univariate analysis of fear of recurrence in young breast cancer patients ( $\bar{x} \pm s$ )/[n(%)]

Variable		Fcr-positive group (n = 76)	Normal group (n = 50)	t/ $\chi^2$	p
FoP-Q-SF score		39.50 ± 3.21	28.16 ± 2.92	20.088	<0.001
ECR Score		146.30 ± 19.02	135.86 ± 25.34	2.638	0.009
Attachment anxiety score		78.50 ± 14.85	70.42 ± 16.42	2.864	0.005
Attachment avoidance score		67.80 ± 5.00	65.44 ± 10.00	-2.571	0.01
DDI score		33.89 ± 4.28	36.52 ± 3.39	-3.829	<0.001
Age (years)		32.16 ± 3.40	34.70 ± 2.78	-4.403	<0.001
Educational level	Primary school and below	5 (6.58)	2 (4.00)	8.949	0.011
	Middle school-high school	28 (36.84)	7 (14.00)		
	College or above	43 (56.58)	41 (82.00)		
Employment status	Unemployed	21 (27.63)	2 (4.00)	11.287	0.001
	Employed	55 (72.37)	48 (96.00)		
Place of residence	Urban	15 (19.74)	8 (16.00)	0.282	0.595
	Rural	61 (80.26)	42 (84.00)		
Medical insurance status	Self-paid	9 (11.84)	7 (8.00)	0.481	0.488
	Medical insurance	67 (88.16)	46 (92.00)		
Family average monthly income	<5000	41 (53.95)	8 (16.00)	18.610	<0.001
	5000~8000	27 (35.53)	30 (60.00)		
	>8000	8 (10.53)	12 (24.00)		
Methods of treatment	Surgery + radiotherapy + chemotherapy + endocrine therapy	48 (63.16)	14 (28.00)	14.949	0.001
	Surgery + chemotherapy + endocrine therapy	27 (35.53)	35 (70.00)		
	Surgery + endocrine therapy	1 (1.32)	1 (2.00)		
Duration of illness	>3 years	5 (6.58)	1 (2.00)	2.247	0.325
	1~2 years	26 (34.21)	14 (28.00)		
	<1 year	45 (59.21)	35 (70.00)		
Number of children	≥3	1 (1.32)	0 (0.00)	1.020	0.796
	2	48 (63.16)	34 (68.00)		
	1	26 (34.21)	15 (30.00)		
	0	1 (1.32)	1 (2.00)		

TABLE 3

Correlation analysis of FoP-Q-SF score with ECR score and DDI score

Variable	Physical health dimension		Social-family dimension		Total score of the FoP-Q-SF	
	r	p	r	p	r	p
Attachment anxiety dimension	0.294	0.005	0.313	0.003	0.308	0.003
Attachment avoidance dimension	0.255	0.017	0.266	0.012	0.265	0.012
Total score of the ECR	0.308	0.003	0.347	0.001	0.333	0.002
Total score of the DDI	-0.309	0.003	-0.329	0.002	-0.324	0.002

This may be related to the extended treatment duration and higher costs of breast cancer treatment compared to common diseases, which imposes a greater economic burden on families. Li et al. [29] also highlighted that reducing the economic burden through medical insurance

and social support can significantly lower the level of FCR among breast cancer patients. The treatment method also had a significant negative predictive effect on the FoP-Q-SF scores of young breast cancer patients. Different conditions and stages of breast cancer require various treatment

TABLE 4  
Variable assignment table

Variable	Assignment of value
Age	Original value input
Education background	Primary school and below (0, 0, 0), Middle school-High school (0, 1, 0), College or above (0, 0, 1)
Employment status	Unemployed (0, 0), Employed (0, 1)
Family average monthly income	<5000 (0, 0, 0), 5000~8000 (0, 1, 0), >8000 (0, 0, 1)
Methods of treatment	Surgery + radiotherapy + chemotherapy + endocrine therapy (0, 0, 0), Surgery + chemotherapy + endocrine therapy (0, 1, 0), Surgery + endocrine therapy (0, 0, 1)
Attachment anxiety	Original value input
Attachment avoidance	Original value input
DDI	Original value input

TABLE 5  
Linear regression analysis

Independent variable		B	S.E	$\beta$	t	p	Collinearity statistic	
							Tolerance	VIF
Constant		70.161	8.885		7.897	<0.001		
Age		-0.459	0.135	-0.245	-3.397	0.001	0.772	1.295
Family average monthly income	5000~8000	-6.594	1.597	-0.517	-4.129	<0.001	0.255	3.919
	>8000	-9.534	1.856	-0.549	-5.137	<0.001	0.350	2.854
Methods of treatment	Surgery + chemotherapy + endocrine therapy	-2.074	0.869	-0.163	-2.386	0.019	0.854	1.171
	Surgery + endocrine therapy	-8.104	3.318	-0.160	-2.442	0.016	0.937	1.067
Attachment anxiety		0.141	0.047	0.353	3.008	0.003	0.291	3.440
Attachment avoidance		-0.182	0.090	-0.213	-2.022	0.046	0.362	2.763
DDI		-0.286	0.120	-0.186	-2.382	0.019	0.657	1.522

Dependent variable: FoP-Q-SF

Note:  $R^2 = 0.543$ , adjusted  $R^2 = 0.499$ ,  $F = 12.330$ ,  $p < 0.001$ .

methods. In this study, the main treatments consisted of surgery and radiotherapy/chemotherapy. More complex treatment methods lead to side effects such as damage, pain, nausea, vomiting, hair loss, skin damage, and bone marrow suppression, increasing patients' awareness of the severity of the disease and making them more prone to experiencing negative emotions such as FCR and anxiety [30].

Regarding the effects of adult attachment and self-disclosure on FCR in young breast cancer patients, this study found that attachment anxiety score, attachment avoidance score, adult attachment total score, and self-disclosure were significantly correlated with FCR through Pearson or Spearman correlation analysis. Further linear regression analysis revealed that higher degrees of attachment anxiety and attachment avoidance, coupled with lower levels of self-disclosure, were associated with higher levels of FCR. Increasing evidence [18,22,31] has demonstrated that intimacy is related to FCR, with adult attachment and self-disclosure impacting marital intimacy.

Young breast cancer patients often experience fear in the face of their diagnosis. Providing appropriate resources can help patients better confront these challenges, with spouses representing a crucial social support resource [31]. Adult attachment influences marital relationship satisfaction, which in turn affects the occurrence and degree of FCR [31,32]. Karbowa-Plowens highlights that individuals with attachment anxiety tend to rely excessively on others and lack self-confidence, hindering their self-management ability. On the other hand, patients with attachment avoidance are more inclined to suppress themselves, enforce independence, and avoid communication with others. This limited psychological endurance can lead to collapse for long-term depression, making it challenging for such patients to establish good nurse-patient relationships and receive effective treatment guidance. Both attachment styles increase patients' negative emotions, and prolonged unresolved issues can exacerbate anxiety and depression, further affecting FCR [33]. Therefore, clinical healthcare

workers should understand the relationship between adult attachment and FCR and adopt effective intervention measures to help patients and their spouses form a secure attachment pattern according to different attachment types. This approach can reduce patients' FCR and improve the satisfaction of the marital relationship.

Spouses of Chinese breast cancer patients often underestimate the psychological pressure experienced by the patients, leading to a tendency to overlook their feelings. When patients attempt to confide in their spouse or family members but receive no response, they tend to withdraw emotionally, which is detrimental to their recovery [16]. Zhou et al.'s study [19] demonstrated that marital self-disclosure intervention for cancer patients can enhance patients' psychological resilience, improve marital quality, alleviate patient anxiety, and consequently reduce the degree of FCR in cancer patients. Therefore, nursing staff should recognize the link between self-disclosure and FCR. For patients who tend to suppress their emotions, measures should be taken to encourage them to communicate with their spouses, family, and friends. This approach can help patients receive more care and support, bolster their confidence in disease treatment, and alleviate FCR.

Our study has several limitations that warrant acknowledgment. Firstly, the sample size of this study is insufficient, which may affect the generalizability of the findings. Additionally, our investigation solely examines the level of adult attachment and self-disclosure from the perspective of patients, neglecting the potential impact of the spouse's attachment style on patients' mental health. Moreover, our study lacks exploration into the relationship between the four types of adult attachment (secure, fearful, preoccupied, and dismissive) and FCR in patients. Future research endeavors will focus on addressing these limitations by expanding the sample size, considering the spouse's attachment style, and investigating the relationship between different types of adult attachment and FCR in breast cancer patients.

## Conclusion

This study has illuminated the relationship between marital attachment, self-disclosure among breast cancer patients, and the fear of cancer recurrence, enabling nurses to gain deeper insights into the crucial role of emotional support between breast cancer patients and their spouses. In clinical practice, nurses can enhance patient care by providing comprehensive health education, fostering a more accurate understanding of the disease, and implementing effective strategies to enhance patients' levels of self-disclosure. Encouraging patients to seek psychological support from their spouses can strengthen marital relationships, alleviate fear and anxiety, and potentially enhance patients' quality of life and confidence in treatment, thereby improving prognosis.

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**Availability of Data and Materials:** All experimental data used to support the findings of this study are available from the corresponding author upon request.

**Ethics Approval:** The study was approved by the Ethics committee of the Jiangsu Cancer Hospital (IRB number: 2023-009). All participants signed the informed consent in this study.

**Conflicts of Interest:** The authors declare that they have no conflicts of interest to report regarding the present study.

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**Appendix A**

**TABLE A1**

**General Information Questionnaire**

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1. Gender: ① Male ② Female
2. Age: \_\_ years old
3. Place of residence: ① Rural ② Urban
4. Employment status: ① Unemployed ② Employed
5. Average monthly household income: ① <5000 yuan/month ② 5000~8000 yuan/month ③ >8000 yuan/month
6. Do you have medical insurance: ① Self-pay ② Have medical insurance
7. Number of children: ① ≥3 ② 2 ③ 1 ④ 0
8. Duration of illness: ① <1 year ② 1~2 years ③ >3 years
9. Treatment method: ① Surgery + Chemotherapy + Radiotherapy ② Surgery + Chemotherapy ③ Surgery

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**TABLE A2**

**Fear of Progression Questionnaire-Short Form (FoP-Q-SF). Read the following issues you may be concerned about, and mark a “√” on the corresponding number according to your true feelings. If there are situations that do not apply to you, please select “Never,” represented by “1”**

Issue	Never	Rarely	Sometimes	Often	Always
1. I worry about disease progression.	1	2	3	4	5
2. I feel nervous before doctor visits and regular check-ups.	1	2	3	4	5
3. I am afraid of pain.	1	2	3	4	5
4. I worry about how it might affect my future work.	1	2	3	4	5
5. I experience some symptoms (such as increased heart rate, stomach pain, etc.).	1	2	3	4	5
6. I worry that my children might contract/inherit this disease.	1	2	3	4	5
7. I worry about depending on strangers for future activities and daily life.	1	2	3	4	5
8. I worry about not being able to pursue my hobbies in the future.	1	2	3	4	5
9. I worry about major treatments during the course of the illness.	1	2	3	4	5
10. I worry that treatments and medications will damage my body.	1	2	3	4	5
11. I worry about how my family will cope if something happens to me.	1	2	3	4	5
12. I worry about not being able to work in the future.	1	2	3	4	5

**TABLE A3**

**Experiences in Close Relationships Inventory (ECR). Please read each statement below (where “partner” refers to your partner), and mark a “√” on the corresponding number according to your true feelings**

Item	Strongly disagree	Disagree	Somewhat disagree	Uncertain	Somewhat agree	Agree	Strongly agree
1. I am not used to expressing my deepest feelings to my partner.	1	2	3	4	5	6	7
2. I worry that my partner will abandon me.	1	2	3	4	5	6	7
3. I feel comfortable being with my partner.	1	2	3	4	5	6	7
4. I have a lot of worries and anxieties about my relationship with my partner.	1	2	3	4	5	6	7

(Continued)

Table A3 (continued)

Item	Strongly disagree	Disagree	Somewhat disagree	Uncertain	Somewhat agree	Agree	Strongly agree
5. Whenever my partner gets close to me, I tend to pull away.	1	2	3	4	5	6	7
6. I worry that my partner's care for me is not as much as mine for them.	1	2	3	4	5	6	7
7. I feel uncomfortable when my partner wants to get close to me.	1	2	3	4	5	6	7
8. I am very worried about losing my partner.	1	2	3	4	5	6	7
9. It feels awkward and uncomfortable for me to honestly express my thoughts and feelings to my partner.	1	2	3	4	5	6	7
10. I often wish that their feelings for me were as deep as mine for them.	1	2	3	4	5	6	7
11. Although I want to be closer to my partner, I always act like I don't want to.	1	2	3	4	5	6	7
12. I wish to spend a lot of time with my partner, but sometimes it scares them.	1	2	3	4	5	6	7
13. I feel uneasy when my partner gets too close to me.	1	2	3	4	5	6	7
14. I fear being alone.	1	2	3	4	5	6	7
15. I can comfortably tell my partner my feelings and thoughts without any reservations.	1	2	3	4	5	6	7
16. I want to be with my partner often and have a good relationship, but sometimes they find it annoying.	1	2	3	4	5	6	7
17. I avoid getting too close to my partner.	1	2	3	4	5	6	7
18. I need my partner to show that they really need me.	1	2	3	4	5	6	7
19. I find it easy to get close to my partner.	1	2	3	4	5	6	7
20. Sometimes, I ask my partner to do things to show they care about me, and they won't neglect me.	1	2	3	4	5	6	7
21. I find it difficult to rely on my partner.	1	2	3	4	5	6	7
22. I can't stand being abandoned.	1	2	3	4	5	6	7
23. I don't like getting too close to my partner.	1	2	3	4	5	6	7
24. If my partner doesn't notice my needs, it makes me feel anxious and angry.	1	2	3	4	5	6	7
25. I tell my partner everything.	1	2	3	4	5	6	7
26. I always feel like my partner won't show the closeness I desire.	1	2	3	4	5	6	7
27. I often discuss my problems and concerns with my partner.	1	2	3	4	5	6	7
28. When I have no one to be close to (no one to accompany me, take care of me), I feel anxious and uneasy.	1	2	3	4	5	6	7
29. Depending on my partner makes me feel secure.	1	2	3	4	5	6	7
30. When my partner can't be by my side as I wish, I feel very sad.	1	2	3	4	5	6	7
31. I feel I can seek comfort, advice, and assistance from my partner.	1	2	3	4	5	6	7
32. When my partner is not there for me when I need them, I feel discouraged.	1	2	3	4	5	6	7
33. Seeking help from my partner when I need it is useful.	1	2	3	4	5	6	7
34. When my partner disagrees with my ideas, I feel it's really my fault.	1	2	3	4	5	6	7

(Continued)

**Table A3 (continued)**

Item	Strongly disagree	Disagree	Somewhat disagree	Uncertain	Somewhat agree	Agree	Strongly agree
35. I ask my partner for a lot of help, including comfort and care.	1	2	3	4	5	6	7
36. I cannot stand it when my partner is not with me.	1	2	3	4	5	6	7

**TABLE A4**

**Distress Disclosure Index (DDI).** This scale is used to measure your level of self-disclosure. Please carefully read each item below and make the best choice based on your actual situation with your partner. Mark a “√” on the corresponding number. There are no right or wrong answers, so feel free to fill it out comfortably

Item	Strongly disagree	Disagree	Uncertain	Agree	Strongly agree
1. When I'm sad, I usually confide in friends.	1	2	3	4	5
2. I am unwilling to discuss my problems.	1	2	3	4	5
3. When unpleasant things happen to me, I often talk to someone about them.	1	2	3	4	5
4. I generally don't discuss things that make me sad with others.	1	2	3	4	5
5. When I feel depressed and sad, I always deal with it alone.	1	2	3	4	5
6. I talk to others about my problems.	1	2	3	4	5
7. When I'm in a bad mood, I chat with my partner.	1	2	3	4	5
8. If I'm sad, I'm least likely to confide in someone.	1	2	3	4	5
9. When I encounter difficulties, I rarely talk to others about them.	1	2	3	4	5
10. When I'm in pain, I don't tell anyone.	1	2	3	4	5
11. When I'm feeling down, I generally talk to someone.	1	2	3	4	5
12. I'm willing to tell others about things that bother me.	1	2	3	4	5