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Cross-Sectional Study on Fear of Cancer Recurrence Among Cancer Survivors Who Completed Treatment for Common Cancers

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ABSTRACT

Introduction: Fear of Cancer Recurrence (FCR) is one of the most common and distressing psychological concerns experienced by cancer survivors. It significantly affects emotional well-being and quality of life, yet remains under-recognized, particularly in low-and middle-income countries due to a lack of culturally adapted screening tools.

Aim and Objectives: The aim was to assess the prevalence and predictors of FCR among cancer survivors. Objectives included estimating FCR prevalence and evaluating its association with demographic and clinical variables.

Methodology: This was a hospital-based cross-sectional analytical study conducted over two months at SVRR Government General Hospital, Tirupati. A total of 150 cancer survivors (head and neck, breast, gynecological, and brain cancers) who had completed treatment with curative intent were recruited based on inclusion/exclusion criteria. The Fear of Cancer Recurrence 7 (FCR-7) questionnaire was translated into Telugu and administered. Descriptive statistics, chi-square tests, and binary logistic regression were used to analyze data using Jamovi software.

Results: Among 150 participants, 35.3% reported significant FCR. Higher FCR was significantly associated with female gender (p=0.049), breast and brain cancer sub-sites (p=0.004), recent treatment (<6 months, p=0.03), widowed/divorced or unmarried status (p=0.006), and multimodal therapy (p=0.017). Logistic regression confirmed significant predictors including female gender, breast cancer, recent treatment, lack of marital support, and aggressive treatment regimens.

Conclusion: FCR is a significant issue among cancer survivors, particularly those with vulnerable psychosocial and clinical profiles. The Telugu FCR-7 scale proved effective for screening. Early identification and culturally appropriate psychosocial support should be integral to survivorship care.

Keywords: *Fear of cancer recurrence, cancer survivors, psychosocial factors, oncology, cross-sectional studies*

1. INTRODUCTION

Fear of cancer recurrence (FCR) is a common and natural psychological response among individuals diagnosed with cancer, regardless of the cancer site [1, 2]. It is often triggered by the life-changing nature of the disease and its treatment. FCR has been identified as one of the most frequently reported and unmet psychosocial needs among cancer survivors, although the severity of fear varies from mild to moderate across individuals [3]. Studies have shown that higher levels of FCR are associated with several psychosocial factors, including younger age, the presence and severity of physical symptoms, mental distress, and poorer quality of life. The consequences of FCR may extend to emotional, behavioral, and functional domains, impacting overall well-being [3, 4].

Various validated instruments have been developed to measure FCR, with some of the most widely used being the Cancer Worry Scale, the Fear of Cancer Recurrence Inventory (FCRI), the Concerns About Recurrence Questionnaire-4, and the Fear of Cancer Recurrence Scale (FCR7 and its short form FCR4) [5]. Among these, the FCR7 has emerged as a widely accepted, concise, and comprehensive tool. It has been translated and validated in different populations, including Chinese-speaking early-stage lung cancer patients, where it demonstrated strong psychometric properties and was recommended for routine screening and management [6].

Most FCR-related research has been conducted in high-income countries. One possible reason for the limited studies in low- and middle-income countries is the lack of culturally adapted and linguistically validated assessment tools. As a relatively recent area of investigation, FCR is only beginning to gain attention in clinical and research settings in such regions.

In this context, the present study aims to assess the prevalence of fear of cancer recurrence among cancer survivors in the state of Andhra Pradesh, India.

2. AIM AND OBJECTIVES

Aim: To identify potential predictors of fear of cancer recurrence among cancer survivors who had completed treatment for common cancers like carcinoma Head and Neck, carcinoma Breast, or Gynaecological cancers like Cervix, Endometrium, Ovary, and Brain tumours like Gliomas.

Objectives

1. To estimate the prevalence of fear of cancer recurrence among cancer survivors.
2. To analyze for any association between baseline demographic characteristics of the study population and fear of cancer recurrence.

3. MATERIALS AND METHODS

Study Design: Hospital-based cross-sectional analytical study.

Study Period: 2 months from the date of approval by the Ethics Committee, SVMC, TIRUPATI.

Study Settings: Oncology OPD, neurosurgery OPD of SVRR Government General Hospital, Tirupati.

Study Subjects

Study population comprising of cancer survivors, who had Carcinoma Head and Neck, Carcinoma Breast or Gynaecological malignancies like cervix, endometrium, ovary, Brain tumour like Gliomas and had completed standard treatment for that disease stage with curative intent and in remission, who are fulfilling the mentioned inclusion criteria.

Inclusion Criteria: Age > 18 years, HPE confirmed, Early stage (I-III), non-metastatic Carcinoma head and neck, Carcinoma Breast, Gynaecological cancers of Cervix, Endometrium, Ovary, Brain tumour like Gliomas**,** Completed treatment with curative intent, No other causes of depression or anxiety and Disease under remission at the time of study.

Exclusion Criteria: Metastatic Carcinoma Breast or Gynaecological cancers of Cervix, Endometrium, Ovary and Progressive disease at the time of study.

Sample Size

Sample for this cross-sectional study with a qualitative outcome of 95% is

$$\mathbf{N = (Z_{\alpha/2})^2\, PQ/d^2}$$

$Z_{\alpha/2}$ = Standard normal variate = 1.96 (at 5% level of significance).

P = Proportion above median FCR = 48.1% [7].

Q = 100 – p = 100 – 48.1% = 51.9%.

d = Absolute precession of 8%.

$$\mathbf{N = (1.96)^2 \times 48.1 \times 51.9/(8)^2 = 150.}$$

Methodology

Cancer survivors who met the inclusion criteria were enrolled in the study. Confirmation of diagnosis and completion of standard treatment were verified and documented prior to recruitment. All eligible participants were informed about the nature and purpose of the study, and written informed consent was obtained from each individual. Demographic and clinical data were collected using a structured proforma designed specifically for the study. Each participant was administered the Fear of Cancer Recurrence (FCR-7) questionnaire, which had been translated into the local language, Telugu, for better comprehension and response accuracy.

Fear of Recurrence 7 (FCR7) questionnaire

The FCR7 is a unidimensional questionnaire designed to assess the severity of Fear of Cancer Recurrence (FCR). It comprises a total of seven items. The first six items are rated on a five-point Likert scale, with response options ranging from 1 ("Not at all") to 5 ("All the time"). These items evaluate the frequency and intensity of FCR-related thoughts and feelings. The seventh item assesses the extent to which FCR interferes with the patient's daily thoughts and activities and is rated on an 11-point scale, from 0 ("Not at all") to 10 ("A great deal").

A score of ≥4 on any of the first six items (1-5 scale), or a score of ≥7 on item 7 (0-10 scale), is considered indicative of a significant level of FCR. Such responses suggest that the individual may require further psychological support or intervention.

4. RESULTS AND ANALYSIS

Data was entered into MS Excel and analysed using Jamovi. Descriptive quantitative data is expressed as mean ± standard deviation. Descriptive qualitative data is expressed as proportions. The chi-square test is used for inferential statistics, and binary logistic regression was used to predict the FCR. P value < 0.05 was considered significant.

Results

Out of 150 cancer survivors, 53 (35.3%) were found to have a significant level of Fear of Cancer Recurrence (FCR) based on FCR7 scores. The remaining 97 (64.7%) did not exhibit significant FCR levels.

Table 1: Distribution of Study Subjects based on Fear of Cancer Recurrence (FCR) Status

FCR Level	Number of Participants	Percentage (%)
No FCR	97	64.7%
Significant FCR	53	35.3%
Total	150	100%

Table 2: Descriptives of Study Participants

Variable	Category	n (150)	%
Age (years)	15-30	4	2.7%
	31-45	33	22.0%
	46-60	60	40.0%
	61-75	48	32.0%
	>75	5	3.3%
Mean age- 54.19±19 years			
Gender	Female	114	76.0%
	Male	36	24.0%
Cancer Sub-site	Head & Neck	74	49.3%
	Gynecological	64	42.7%
	Breast	10	6.7%
	Brain	2	1.3%
Education	Illiterate	28	18.7%
	Primary School	36	24.0%
	High School	47	31.3%

	Intermediate/Diploma	20	13.3%
	Graduate & above	19	12.7%
Occupation	Homemaker	82	54.7%
	Farmer/Laborer	30	20.0%
	Government/Private Job	16	10.7%
	Retired	12	8.0%
	Student/Unemployed	10	6.6%

The study included 150 participants, predominantly in the 46-60 years age group (40%), followed by 61-75 years (32%), indicating a mid-to-late adult population affected by cancer. A majority were female (76%), reflecting the gender distribution across the cancer sub-sites studied. Head and neck cancers were most prevalent (49.3%), followed by gynecological cancers (42.7%), while breast (6.7%) and brain cancers (1.3%) were less common. In terms of education, 18.7% of participants were illiterate, and most had education up to high school (31.3%) or primary school (24%), suggesting limited formal education in the cohort. Homemakers formed the largest occupational group (54.7%), followed by farmers/laborers (20%), with only 10.7% engaged in formal employment. This demographic profile highlights a predominantly older, female, low-educated, and socioeconomically vulnerable population, which may influence psychological outcomes like fear of cancer recurrence.

Table 3: Chi-square Analysis: Association between Variables and Fear of Cancer Recurrence (FCR)

Variable		**No FCR (n)**	**Significant FCR (n)**	**Total**
Age (years)	15-30	3	1	4
	31-45	24	9	33
	46-60	40	20	60
	61-75	28	20	48
	>75	2	3	5
Chi square-3.04, p-value-0.436				
Gender	Female	69	45	114
	Male	28	8	36
Chi square-3.56, p-value-0.049*				
Sub-site	Head & Neck	52	22	74
	Gynaecological	43	21	64
	Breast	2	8	10
	Brain	0	2	2
Chi square-13.5, p-value-0.004*				
Education	Illiterate	16	12	28
	Primary School	26	10	36
	High School	31	16	47
	Intermediate/Diploma	15	5	20
	Graduate & above	9	10	19
Chi square-5.5, p-value-0.02*				
Time since treatment	< 6 months	15	18	33

	6-12 months	28	15	43
	1-3 years	34	13	47
	> 3 years	20	7	27
Chi square-8.6, p-value-0.03*				
Marital Status/Support	Married with strong support	65	20	85
	Married with weak support	10	7	17
	Unmarried	12	10	22
	Widowed/Divorced	10	16	26
Chi square - 14.3, p-value-0.006*				
Treatment Type	Surgery only	25	6	31
	Surgery + Chemotherapy	28	15	43
	Surgery + Radiotherapy	24	11	35
	Surgery + Chemo + Radiotherapy	20	19	39
	Hormonal/Targeted therapy only	0	2	2
Chi square-11.6, P-value-0.017*				

*Statistically significant.

The chi-square analysis revealed several significant associations between demographic and clinical variables and the presence of significant Fear of Cancer Recurrence (FCR). Gender was significantly associated with FCR ($\chi^2 = 3.56$, $p = 0.049$), with females reporting a higher proportion of FCR than males. Cancer sub-site was strongly associated with FCR ($\chi^2 = 13.5$, $p = 0.004$), with breast and brain cancer patients experiencing more significant fear compared to those with head and neck or gynecological cancers. Education level also showed a significant association ($\chi^2 = 5.5$, $p = 0.02$), where participants with graduate-level education reported higher FCR. Time since treatment was significantly related to FCR ($\chi^2 = 8.6$, $p = 0.03$); those within 6 months of treatment had higher FCR, which gradually decreased over time. Marital status and support played a critical role ($\chi^2 = 14.3$, $p = 0.006$), with widowed/divorced and unmarried individuals showing higher levels of FCR than those with strong spousal support. Treatment modality was also a significant factor ($\chi^2 = 11.6$, $p = 0.017$), with patients who underwent combined treatments (surgery, chemotherapy, and radiotherapy) or hormonal/targeted therapies reporting greater FCR than those treated with surgery alone. Age was not significantly associated with FCR ($\chi^2 = 3.04$, $p = 0.436$), indicating that FCR is influenced more by psychosocial and clinical factors than by age alone.

Table 4: Binary Logistic Regression Analysis of Predictors of Significant Fear of Cancer Recurrence (FCR)

Predictor Variable	Category (Reference Group)	Odds Ratio (OR)	95% CI	p-value
Gender	Male (vs Female)	0.42	0.18-0.98	0.049*
Cancer Sub-site	Gynaecological (vs Head & Neck)	1.15	0.61-2.17	0.66
	Breast (vs Head & Neck)	9.45	1.78-50.1	0.008*
	Brain (vs Head & Neck)	6.78	0.84-54.5	0.072
Education Level	Primary School (vs Illiterate)	0.51	0.19-1.39	0.19
	High School (vs Illiterate)	0.69	0.27-1.75	0.44
	Intermediate/Diploma (vs Illiterate)	0.55	0.17-1.76	0.32
	Graduate & above (vs Illiterate)	1.48	0.48-4.50	0.50
Time Since Treatment	6–12 months (vs <6 months)	0.45	0.18-1.11	0.082
	1–3 years (vs <6 months)	0.29	0.11-0.76	0.012*

	>3 years (vs <6 months)	0.25	0.08-0.74	0.013*
Marital Status/Support	Married with weak support (vs strong)	2.28	0.81-6.46	0.12
	Unmarried (vs strong support)	2.71	1.03-7.12	0.044*
	Widowed/Divorced (vs strong support)	5.20	2.05-13.2	0.001*
Treatment Type	Surgery + Chemotherapy (vs Surgery only)	2.23	0.87-5.69	0.093
	Surgery + Radiotherapy (vs Surgery only)	2.13	0.79-5.70	0.13
	Surgery + Chemo + Radiotherapy	3.95	1.49-10.4	0.006*
	Hormonal/Targeted only (vs Surgery only)	6.15	0.51-74.1	0.15

*Statistically significant.

Binary logistic regression analysis identified several significant predictors of severe Fear of Cancer Recurrence (FCR). Gender was a significant factor, with males having lower odds of experiencing FCR compared to females (OR = 0.42, p = 0.049). Among cancer sub-sites, breast cancer was strongly associated with higher FCR compared to head and neck cancers (OR = 9.45, p = 0.008), while brain cancer showed a borderline significance (OR = 6.78, p = 0.072). Time since treatment showed a protective effect, with participants 1-3 years and more than 3 years post-treatment having significantly lower odds of FCR than those within 6 months (OR = 0.29, p = 0.012 and OR = 0.25, p = 0.013, respectively). Marital status also influenced FCR, with unmarried (OR = 2.71, p = 0.044) and widowed/divorced individuals (OR = 5.20, p = 0.001) having higher odds compared to those with strong spousal support. In terms of treatment type, those who underwent combined surgery, chemotherapy, and radiotherapy had significantly higher odds of FCR (OR = 3.95, p = 0.006) compared to those who had surgery only. Education level, other treatment modalities, and marital status with weak support, did not show statistically significant associations in the adjusted model.

5. DISCUSSION

The present study highlights that 35.3% of cancer survivors in a tertiary care center in Andhra Pradesh experienced significant Fear of Cancer Recurrence (FCR). This finding aligns with previous studies, including Nandakumar *et al.* [7], who reported similar FCR levels among Indian breast cancer survivors using the Tamil version of FCR-7, emphasizing the tool's applicability in regional contexts.

Gender was significantly associated with FCR, with females showing higher odds (OR = 0.42, p = 0.049). This is consistent with findings from Simard *et al.* [1], who demonstrated a gender-based disparity in FCR, likely due to differing emotional coping mechanisms and societal expectations. Furthermore, Pizzo *et al.* [2] found similar gender effects in childhood cancer survivors.

Cancer sub-site had a marked impact: breast cancer survivors had significantly higher FCR (OR = 9.45, p = 0.008). This is supported by Thewes *et al.* [8], who noted heightened concerns among breast cancer patients, particularly related to body image, survivorship identity, and recurrence risk awareness. Brain tumor patients also had elevated FCR levels (though borderline significant), reflecting findings by Heros (3), who described emotional distress due to cognitive and neurological impairments.

Time since treatment was inversely related to FCR, with those more than a year post-treatment having lower odds of FCR (OR = 0.29 for 1-3 years, p = 0.012). This mirrors studies by Lee *et al.* [4] and Custers *et al.*, who observed declining FCR as patients adapted to survivorship and gained reassurance from follow-up.

Marital status and support systems played a crucial role: widowed/divorced (OR = 5.20) and unmarried individuals (OR = 2.71) had significantly higher FCR than those with strong support, reinforcing that social support buffers psychological distress, as emphasized in the review by Simard *et al.* [1].

Interestingly, education level, though significant in univariate analysis, did not retain significance in multivariate regression. This discrepancy may suggest that formal education alone does not mitigate FCR unless paired with emotional literacy and cancer-related awareness.

Treatment modality was another predictor: those receiving multimodal therapy (surgery + chemotherapy + radiotherapy) had higher odds of FCR (OR = 3.95, p = 0.006), possibly due to prolonged exposure to the healthcare system, invasive procedures, and fear of future complications. This supports findings from global studies highlighting the psychological toll of intensive treatment regimens (Humphris *et al.* [9].

In contrast, age was not significantly associated with FCR, differing from some earlier research. This may reflect cultural differences in coping or survivor outlooks in Indian populations.

Overall, our study confirms that FCR is prevalent and influenced by multiple socio-demographic and clinical factors. It emphasizes the need for early psychological screening using tools like FCR7, particularly in resource-limited settings. Moreover, addressing support systems, survivorship care plans, and gender-specific counseling may mitigate FCR and improve quality of life.

6. CONCLUSION

This study found that 35.3% of cancer survivors experienced significant Fear of Cancer Recurrence (FCR), particularly among females, breast and brain cancer patients, those recently treated, unmarried or widowed individuals, and those receiving multimodal therapy. The FCR-7 scale, translated into Telugu, proved effective for local screening. These findings emphasize the urgent need for integrating psychological assessment into survivorship care, especially in resource-limited settings. Early identification of high-risk groups enables timely psychosocial support, potentially improving overall quality of life and emotional well-being. Addressing FCR should become a core component of comprehensive, culturally appropriate cancer care in India.

Conflict of Interest: No.

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