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Fear of cancer recurrence among cancer survivors in Singapore

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INTRODUCTION Fear of cancer recurrence (FCR) among cancer survivors is a persistent and distressing psychosocial concern that affects recovery and quality of life. The prevalence of FCR in Singapore is unknown. This cross-sectional study was designed to examine FCR and identify factors associated with FCR in mixed-cancer survivors locally.

METHODS Cancer survivors in remission (n = 404) were assessed for: FCR using the Fear of Cancer Recurrence Inventory (FCRI); emotional distress using the Hospital Anxiety and Depression Scale; and quality of life using the World Health Organization Quality of Life-BREF. Clinical and severe/pathological FCR was determined based on the severity scale of FCRI, known as FCRI-Short Form. Multivariate logistic regression was performed to examine factors associated with FCR.

RESULTS The mean score on the FCRI was 59.5 ± 30.4. 43.6% of cancer survivors had clinical FCR and 32.1% had severe/pathological FCR. Younger age (odds ratio [OR] 0.952, 95% confidence interval [CI] 0.911–0.995, p < 0.05), higher educational status (OR 2.55, 95% CI 1.15–5.65, p < 0.05) and higher levels of emotional distress (OR 1.17, 95% CI 1.10–1.24, p < 0.001) were significantly associated with severe/pathological levels of FCR.

CONCLUSION The present study is the first to determine levels of FCR among cancer survivors in Singapore. While the total FCR scores were similar to those of international studies, severe/pathological levels of FCR were found to be four times higher. These findings highlight a problem that is not widely recognised or acknowledged, but which deserves greater attention.

Keywords: cancer survivors in Singapore, fear of cancer recurrence

INTRODUCTION

The diagnosis of cancer can be devastating for many patients regardless of the stage of cancer, available treatment and prognosis.[1] Equally debilitating is the fear of cancer recurrence (FCR), which occurs across the continuum of the illness and even after successful treatment. FCR has been endorsed as one of the top five greatest concerns of cancer survivors and described as a 'universal concern' across cancer populations.[2-4] Persistent, elevated FCR is known to be associated with clinical depression, anxiety, post-traumatic stress symptoms and poor quality of life among cancer survivors.[3,5] When it occurs in the survivorship phase, the fear is comparable between short- and long-term survivors, suggesting 'persistence throughout survivorship'. McGinty et al have conceptualised this fear as multidimensional with cognitive, affective and behavioural components,[6] and a cognitive behavioural model has been proposed as a theoretical framework for therapy.[7-9] A recent colloquium of experts in the field of FCR has established the following relevant definition of FCR for research and clinical use: "*fear, worry, or concern about cancer returning or progressing*".[10]

Research on the prevalence and severity of FCR among cancer survivors has mainly been conducted in Western populations. These have reported a wide range of 39%–97% (average 73%) of survivors having some degree of FCR.[11] About 27%–87% (average 49%) of these cancer survivors reported moderate to high degrees of FCR, while approximately 0%–15% (average 7%) of cancer survivors reported high levels of FCR.[2,11] The variability of the results may be attributable, to some extent, to the different measures used to assess FCR.[12] There are several brief scales that have been used to measure FCR, and they range from two to five items (Table I).[13-22] However, measures that rely on a single item or focus on limited dimensions, such as severity, frequency or functional consequences, may not adequately capture the multidimensionality of FCR and thus, limit their overall validity and reliability.[11] There are four longer scales that measure FCR (Table I).[23-26] Of these, the Fear of Cancer Recurrence Inventory (FCRI) was developed to measure several aspects of FCR, reflecting the multidimensional nature of FCR.[26]

Gaps in understanding of FCR have resulted from contradictory findings of the key factors associated with FCR.[2] A 2013 systematic review of 43 studies by Crist and Grunfeld found that younger age most consistently predicted elevated FCR, while other factors were reported in some but not all studies, including higher levels of emotional distress and lower quality of life.[5] Importantly, this review highlighted that the majority of studies were focused on one type of cancer, specifically breast or gynaecological cancers, with a lack of research on mixed-cancer populations.[5] Furthermore, research to date has been predominantly conducted in Western populations, with only two studies[27,28] from the abovementioned systematic review from Asian countries: the Japanese study used a single item to measure FCR,[27] while the South Korean study used the Fear of Progression Questionnaire.[28]

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Table I. Scales for the measurement of fear of cancer recurrence.[12]

Scale for fear of cancer recurrence measurement	No. of items	Study, year
Brief scales		
Lasry & Margolese Fear of Recurrence Index (LMRI)	2	Lasry & Margolese,[13] 1992
Cancer Worry Scale (B) (CWS-B)	2	Cameron et al,[14] 2007
Worry about Prostate Cancer Scale (WPCS)	2	Diefenbach et al,[15] 2008
Worry of Cancer Scale Revised (WOC-R)	2	Hodges & Humphris,[16] 2009
Cancer Worry Scale-A (CWS-A)	3	Easterling & Leventhal,[17] 1989
Fear of Recurrence Scale (B) (FRSb)	3	Franssen et al,[18] 2009
Fear of Recurrence Scale (A) (FRSa)	4	Rabin et al,[19] 2004
Cancer-related Worries Scale (CRWS)	4	Deimling et al,[20] 2006
Fear of Relapse/Recurrence Scale (FRRS)	5	Greenberg et al,[21] 1997
Assessment of Survivor Concerns Scale (ASCS)	5	Gotay & Pagano,[22] 2007
Longer scales		
Fear of Recurrence Questionnaire (FRQ)	22	Northouse,[23] 1981
Fear of Progression Questionnaire (FOP-Q)	43	Herschbach et al,[24] 2005
Concerns About Recurrence Scale (breast cancer specific)	30	Vickberg,[25] 2003
Fear of Cancer Recurrence Inventory (FCRI)	42	Simard & Savard,[26] 2009

Therefore, applicability to non-Western populations is unknown. Recommendations have been made for further research to better understand the impact of sociodemographic variables (e.g. gender) and medical variables on FCR in mixed-cancer populations.[5] Additionally, research in our local setting would provide a clearer profile of cancer survivors in Singapore, help us identify those at risk and understand their needs, and enable us to determine the factors associated with FCR for service development and delivery.

The aim of this study was to examine the prevalence of FCR and identify the sociodemographic and psychological factors associated with FCR among mixed-cancer survivors in Singapore. No *a priori* hypothesis was made, as there have been no previous studies in the local population.

METHODS

A total of 927 participants were identified and approached during their follow-up visits at the National University Cancer Institute, Singapore. 462 participants were recruited from February 2015 to June 2016. Inclusion criteria were: (a) a diagnosis of cancer; (b) at least one year since the completion of treatment (surgery, chemotherapy and/or radiotherapy); (c) cancer status in remission; (d) age 21–84 years old; (e) Singapore citizens or permanent residents; and (f) ability to understand and read English or Mandarin. Ethics approval was granted by the National Healthcare Group Domain Specific Review Board A (reference number: 2015/00003). All participants provided written informed consent prior to being included in the study.

This was a cross-sectional study that involved a questionnaire methodology. Participants completed a self-report questionnaire on sociodemographic characteristics (e.g. gender, age, ethnicity, marital status, education and occupation) and medical variables (e.g. comorbid chronic physical conditions, cancer type and stage, type of cancer treatment received and time since completion of treatment).

FCR was measured with the FCRI, a 42-item self-report questionnaire that provides a multidimensional assessment of FCR. The FCRI has been found to be suitable for mixed-cancer populations who differ in diagnoses and time since diagnosis.[26] The questionnaire evaluates seven components: the presence of potential stimuli activating FCR; the presence and severity of intrusive thoughts or images associated with FCR; the potential consequences of FCR (both psychological distress and reassurance behaviours); the level of self-criticism towards FCR intensity; and the coping strategies that can be used to cope with FCR.[26] The FCRI was initially developed in French, and the English version was validated in a group of mixed cancer patients in Canada.[29] The English and Mandarin versions of the FCRI have been validated in the local cancer population, and both measures were observed to have good psychometric properties.[30] Participants rate the items on a Likert scale from 0 (not at all or never) to 4 (a great deal or all the time). Only one item (Item 13) is reverse-scored, and total scores are obtained for each subscale and for the entire scale by summing up the items; higher scores indicate higher levels of FCR.[26]

The severity subscale of the FCRI forms the nine-item FCRI-Short Form (FCRI-SF); it has strong correlations with the total FCRI score and is used to determine severe/pathological levels of FCR.[26] A cut-off score of 13 or higher on the FCRI-SF is associated with optimal sensitivity (88%) and specificity (75%) for screening clinical levels of FCR.[31] Research has also suggested a higher cut-off score of 16 (increases specificity to 97% but lowers sensitivity) as an optimal diagnostic cut-off for severe/pathological levels of FCR.[31] The present study used the FCRI-SF cut-off score of 13 to establish clinical levels of FCR and the cut-off score of 16 to determine the prevalence of severe/pathological levels of FCR.

The 14-item questionnaire, Hospital Anxiety and Depression Scale (HADS) was used to measure the severity of patients' emotional distress. The HADS, a validated self-report measure designed for use in a hospital setting, comprises two subscales

Table II. Sociodemographic and clinical characteristics of participants (n = 404).

Variable	Mean ± SD/no. (%)*	Variable	Mean ± SD/no. (%)*
Age (yr)	55.8 ± 11.5	**Cancer stage**	
Gender		Early (Stage 1 or 2)	226 (70)
Male	80 (20)	Late (Stage 3 or 4)	98 (30)
Female	324 (80)	**Treatment completed**	
Marital status		Chemotherapy	229 (58)
Married	112 (28)	Radiotherapy	117 (45)
Divorced/single/others	287 (72)	Surgery	292 (74)
Ethnicity		**Time since treatment completion (mth)**	63.2 ± 62.1
Chinese	318 (80)	**Chronic physical comorbidities**†	
Malay	44 (11)	Yes	188 (80)
Indian	25 (6)	No	47 (20)
Others	14 (4)	**FCR**	173 (44)
Education		**Severe/pathological FCR**	128 (32)
Secondary and below	271 (68)	**FCR dimensions**	
Tertiary and above	128 (32)	Triggers	12.9 ± 7.2
Occupational status		Severity	12.3 ± 6.8
Employed	219 (56)	Psychological distress	4.6 ± 4.3
Unemployed	173 (44)	Functional impairment	6.8 ± 6.7
Cancer type		Insight	2.3 ± 2.7
Breast	154 (39)	Reassurance	3.8 ± 3.2
Gynaecologic	106 (27)	Coping strategies	16.8 ± 9.4
Colorectal	55 (14)	**Emotional distress**	8.3 ± 6.6
Multisite	16 (4)	**Quality of life domains**	
Nasopharyngeal	14 (4)	Physical	60.5 ± 19.2
Haematological	14 (4)	Psychological	62.9 ± 17.5
Lung	14 (4)	Social relations	58.8 ± 21.0
Pancreas	3 (1)	Environmental	55.6 ± 20.4
Brain tumour	2 (1)		

*Percentage values are used as valid percentages (of participants) and not exact percentages of total sample. †Chronic physical comorbidities (yes/no) refer to at least one diagnosis of hypertension, hyperlipidaemia, diabetes mellitus, stroke, renal disease, cardiac conditions or arthritis. FCR: fear of cancer recurrence; SD: standard deviation

measuring depression and anxiety.[32] Previous research has validated the use of the HADS in the Singapore cancer population.[33] The subscales in the HADS may be combined to obtain a total distress score (ranging from 0 to 42) as a measure of emotional distress. Participants were asked to rate how they felt in the past week on a 4-point Likert scale (0 = not at all to 3 = most of the time). Higher scores obtained on the HADS indicate greater emotional distress.[32] Scores < 7 indicate non-cases.[34]

The 26-item World Health Organization Quality of Life Instrument – Short Version (WHOQOL-BREF), an abbreviated version of the WHOQOL, was used to measure four domains of quality of life (physical, psychological, social relations and environmental). Participants were asked to score how they felt about different aspects of their life in the past four weeks on a 5-point Likert scale (1 = not at all to 5 = an extreme amount). Higher scores indicate a better self-perceived quality of life in each domain.[35]

Descriptive and regression analyses were performed using IBM SPSS Statistics version 23.0 (IBM Corp, Armonk, NY, USA). Mean and standard deviation were calculated for continuous variables, and frequencies and percentages for all other categorical variables. Pearson's correlation was conducted to examine the associations between overall FCR, emotional distress and quality of life domains (physical, psychological, social relations and environmental). Multivariate logistic regression analysis was performed to examine the sociodemographic (gender, age, ethnicity, marital status, education, occupation), medical (comorbid chronic physical conditions, cancer type and stage, type of cancer treatment received and time since completion of treatment), and psychological (emotional distress and quality of life domains) variables that were associated with severe/pathological (≥ 16) levels of FCR.

RESULTS

Completed data was available for 404 participants. Table II presents the participants' sociodemographic and medical characteristics. Notably, participants were mostly female (80%) with early stage cancer (70%).

The mean emotional distress score was 8.3 ± 6.6 (Table II); the scores on the HADS range were mild: 8–10, moderate: 11–14 and severe: 15–21. Self-perceived quality of life was the lowest

Table III. Associations between fear of cancer recurrence (FCR), emotional distress, and quality of life domains.

Pearson's r	FCR	Emotional distress	Physical	Psychological	Social relations	Environmental
FCR	1					
Emotional distress	0.61*	1				
Physical	–0.22*	–0.53*	1			
Psychological	–0.31*	–0.65*	0.70*	1		
Social relations	–0.19*	–0.39*	0.54*	0.63*	1	
Environmental	–0.18*	–0.44*	0.65*	0.74*	0.63*	1

*Correlation significant at $p < 0.01$.

Table IV. Results from logistic regression model examining the sociodemographic, medical, and psychological correlates of overall and severe/pathological fear of cancer recurrence.

Variable	Logistic regression model*		
	Odds ratio	95% CI	p-value
Age	0.952	0.911–0.995	< 0.05
Emotional distress	1.17	1.10–1.24	< 0.001
Education (tertiary and above)	2.55	1.15–5.65	< 0.05
Education (secondary and below)	Reference		

*Logistic regression model included age, gender, ethnicity, education status, occupation status, cancer stage, cancer type, type of treatment completed, time since treatment completion, chronic physical comorbidities, emotional distress and quality of life domains (physical, psychological, social relations and environmental). However, only variables with significant associations with fear of cancer recurrence were detailed above. CI: confidence interval

on the environmental domain of the WHOQOL-BREF (which included eight items: financial resources; accessibility and quality of health and social care, home and physical environment; and participation and opportunities for recreation/leisure activities). It was the highest on the psychological domain (which included six items: bodily image and appearance; negative and positive feelings; self-esteem; spirituality and cognition). The mean FCRI score was 59.5 ± 30.4. On the FCRI-SF, 43.6% of participants had clinical FCR (cut-off score ≥ 13) and 32.1% experienced severe/pathological levels of FCR (cut-off score ≥ 16).

Table III presents the correlations between overall FCR, emotional distress and quality of life domains. FCR was positively associated with the emotional distress domain of quality of life ($r = 0.61$, $p < 0.01$) and negatively associated with the physical ($r = –0.22$, $p < 0.01$), psychological ($r = –0.31$, $p < 0.01$), social relations ($r = –0.19$, $p < 0.01$) and environmental ($r = –0.18$, $p < 0.01$) domains. Emotional distress was also negatively associated with the same quality of life domains.

Table IV presents the results of the multivariate logistic regression analysis, which examined the sociodemographic-medical and psychological correlates of severe/pathological FCR. Firstly, multivariate logistic regression analysis revealed that a one-year age increment had at least a 5% reduction in risk of severe/pathological levels of FCR (odds ratio [OR] 0.952, 95% confidence interval [CI] 0.911–0.995, $p < 0.05$). Secondly, it showed that the odds of experiencing severe/pathological FCR for those with a higher educational status (tertiary and above) was 2.55 times (95% CI 1.15–5.65, $p < 0.05$) that of those with a lower educational status (secondary and below). Thirdly, it revealed that higher levels of emotional distress (OR 1.17, 95% CI 1.10–1.24, $p < 0.001$) were significantly associated with severe/pathological levels of FCR.

DISCUSSION

The present study is the first to examine the prevalence, severity and factors associated with FCR among mixed cancer survivors in Singapore. The level of FCR (mean 59.5 ± 30.4) was comparable to that of two other studies (mean 51.7 ± 28.8 and 53.8 ± 27.8, respectively) conducted in Western mixed-cancer populations,[4,26] suggesting similarities across cultures. While the prevalence of clinical FCR in our study was similar to that of Western populations (43.6% vs. 46%), severe/pathological FCR among cancer survivors in Singapore was slightly more than four times that reported in Western populations (32.1% vs. 7%).[2] Several issues need to be considered when interpreting these findings. Clinical assessments were not included in our study design and participants who reported levels of clinical FCR were not assessed by a clinician, which would have provided a definitive diagnosis. Additionally, there is still no consensus on the distinctions between mild, moderate and severe levels of FCR.[36] Despite these limitations, our findings suggest that clinicians should be concerned about and aware of FCR. Screening, assessments and patient and caregiver psycho-education should be priority measures.

We have noted that among cancer survivors in Singapore, younger age, higher educational status and higher level of emotional distress are significantly associated with overall and severe/pathological FCR. Crist and Grunfeld have suggested that younger cancer survivors might have more difficulties with managing the uncertainties associated with cancer recurrence.[5] This has been attributed to greater financial commitments faced by younger adults, who may be at an early stage in their career, with lower income, little savings and greater family responsibilities. Shim et al, examining concerns related to cancer progression among Korean cancer patients, found that familial concerns, specifically a perceived sense of being a burden to one's family, was the most predominant concern.[28] An earlier qualitative study conducted in cancer caregivers in Singapore supports the notion of burden in the patient-caregiver interaction. The study revealed that cancer caregivers provide care because of family obligations and filial piety, that family caregiving is not uniformly experienced as positive, and that it is burdensome for those providing care for extrinsic motivations.[37] The role and impact of familial concerns

and motivations on a cancer patient may be a unique aspect of Asian cultures, and necessitates further exploration among cancer survivors in Singapore.

There is considerable evidence in the literature to account for the relationship between emotional distress and FCR, such as higher levels of catastrophic thinking and worry that may result in greater FCR.[28,38,39] While the present study did not determine the cause of emotional distress symptoms, the findings underscore the importance of continued psychological care during the post-treatment phase. Untreated emotional distress due to other concerns (e.g. body image concerns following completion of treatment)[40] may later serve as a risk factor for FCR.[25]

The association between higher educational status and severe/pathological levels of FCR could be due to these individuals having knowledge, resources and the ability to seek more information about their illness, treatment and prognosis. A greater awareness of risk factors and the implications of cancer recurrence may have also resulted in more catastrophic thinking, leading to increased severity of FCR.

Unlike previous studies,[5] the present study did not find an association between quality of life domains (physical, psychological, social relations and environmental) and FCR. However, our earlier research has shown that specific psychological resources (e.g. mindfulness and spirituality) have a role in alleviating emotional distress among Singapore cancer patients.[41] The possibility of using these resources and enhancing them in cancer survivors may potentially be protective against FCR.

There were no significant results for gender and ethnicity, both of which have been reported to be associated with more contradictory findings in the FCR literature.[5] Finally, similar to the majority of research studies in the FCR literature,[5] the present study did not observe significant associations between medical variables (e.g. cancer and treatment-related factors) and FCR. This may suggest that underlying cognitive processes may be more important in FCR, affecting all survivors across a broad spectrum of cancer types, medical comorbidities and treatment modalities.

There are several potential limitations to the present study, the most important being the cross-sectional study design, which precludes any causal inferences. Longitudinal research is required to examine the temporal effects of predictors and changes in FCR over time. Secondly, selection bias should be considered as a possible reason for the high levels of severe/pathological levels of FCR. Distressed patients may have agreed to participate, while those who were not distressed or were experiencing mild levels of distress may not have participated. Thirdly, the use of self-report measures may introduce response bias. Fourthly, a mixed-cancer sample may conflate a range of cancer severity, and factors associated with specific cancer types may not be elucidated in this study. However, examining FCR in a mixed-cancer sample remains important, as this is in line with the international call for additional research in this area.[2,5] Importantly, findings based on a mixed-cancer sample may be generalised to a wider, heterogeneous population of cancer survivors in Singapore. Lastly, while the FCRI may have been recently validated in the local population,[16] caution must be taken to interpret the prevalence rates of severe/pathological FCR based on the cut-offs established in Western populations.

Notwithstanding these limitations, the present study contributes new knowledge pertaining to the level of FCR and prevalence of severe/pathological FCR in mixed-cancer survivors in Singapore. Importantly, the present study has also supported and clarified previous findings on factors associated with elevated and clinical levels of FCR. The use of a large sample size (n = 404) addresses the methodological limitations in previous small studies,[2,5] but also suggests the need for larger epidemiological-type studies to examine the problem locally.

The study results would be useful to clinicians and therapists in dealing with patient's concerns about their illness and disease status, designing relevant post-treatment interventions and, ultimately, enhancing psychosocial care of cancer survivors. In service delivery, prioritising the needs of cancer survivors with severe/pathological levels of FCR is a primary concern and screening programmes need to be developed. Further research in a longitudinal study of risk factors and protective factors will support this initiative, as well as address the lack of consensus on the different levels of FCR severity.

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