Received: 8 October 2017 | Revised: 14 March 2018 | Accepted: 17 April 2018

DOI: 10.1002/pon.4748

PAPER

WILEY

Utilization of health care services in cancer patients with elevated fear of cancer recurrence

Alexandra Champagne[1] | Hans Ivers[1,2,3] | Josée Savard[1,2,3]

[1] School of Psychology, Université Laval, Quebec, Qc, Canada

[2] Université Laval Cancer Research Center, Quebec, Qc, Canada

[3] CHU de Québec-Université Laval Research Center, Quebec, Qc, Canada

Correspondence
Josée Savard, PhD, Centre de recherche du CHU de Québec-Université Laval-L'Hôtel-Dieu de Québec, 11 Côte du Palais, Québec, Qc, Canada, G1R 2J6.
Email: josee.savard@psy.ulaval.ca

Funding information
Canadian Institutes of Health Research, Grant/Award Number: MOP-69073

Abstract

Background: Cancer patients commonly report experiencing fear of cancer recurrence (FCR), which may lead to several negative consequences. This study aimed at examining whether clinical levels of FCR are linked to a greater use of health care services.

Method: This is a secondary analysis of a longitudinal study of 962 cancer patients on the epidemiology of cancer-related insomnia. They completed the Fear of Cancer Recurrence Inventory—Short form (FCRI-SF) and reported information on their consultations (medical, psychosocial, and complementary and alternative medicine [CAM]) and medication usage (anxiolytics/hypnotics and antidepressants) at 6 time points over an 18-month period.

Results: Results indicated that clinical FCR at baseline was associated with greater consultation rates of medical and psychosocial professionals and a greater usage of anxiolytics/hypnotics and antidepressants. No significant association was found between the FCR level and use of CAM services. While consultation rates of medical and CAM professionals and usage of antidepressants generally increased over time, consultation rates of psychosocial professionals and usage of anxiolytics/hypnotics tended to decrease.

Conclusions: Cancer patients with clinical levels of FCR are more likely to consult health care providers and to use psychotropic medications, which may translate into significant costs for society and the patients themselves.

KEYWORDS

cancer, complementary and alternative medicine, fear of cancer recurrence, health care utilization, longitudinal study, oncology, psychotropic medication usage

1 | BACKGROUND

Fear of cancer recurrence (FCR) is defined as the fear, worry, or concern about cancer returning or progressing.[1] Between 22% and 87% of cancer patients report moderate to high levels of FCR, which tend to persist over time.[2] FCR can lead to several negative consequences, especially when it is severe and persistent including increased psychological distress and diminished quality of life.[2-4] Maladaptive coping strategies such as excessive threat monitoring and avoidance behaviors have also been found to be correlated with FCR.[2] These coping mechanisms could translate into both an increased or decreased utilization of health care services. A greater utilization of health care services could reflect reassurance seeking behaviors, with the aim to increase one's conviction that somatic symptoms experienced are not signs of cancer recurrence.[5,6] Patients with elevated FCR can also consult health care professionals to better cope with FCR per se and other psychological disturbances that are associated with it (eg, depression).[2-4] Conversely, patients with high FCR could also underutilize health care services to avoid any triggers that would increase their FCR.

Only a few studies have documented a possible association between FCR and utilization of health care services. Two studies showed that elevated FCR was related to a greater use of medical services (eg, outpatient and emergency room visits).[7,8] Available evidence also revealed that elevated FCR was associated with an increased use of psychological interventions (eg, counseling, support group, and relaxation).[8,9] Women who initiated a new psychological therapy within 1 year post-surgery exhibited higher FCR levels 3 and 12 months after the surgery when compared with non-users.[9] With regard to complementary and alternative medicine (CAM), studies found a link between FCR and an increased utilization of these types of services/products.[8-10] Within the year following the surgery, new users of healing therapies (eg, megavitamins, massage) exhibited higher FCR levels when compared with non-users but only at 3-month post-surgery.[9] By contrast, another study revealed that high FCR was unrelated to the utilization of different types of health care services (psychological, medical, integrated/complementary, spiritual/religious, and other support services).[11] The only study which investigated the association between FCR and medication usage revealed a significant correlation between these 2 variables but that did not remain significant after controlling for sex.[7]

Previous studies are characterized by several limitations. Two studies included women with early-stage breast cancer only,[8,9] one did not use a validated questionnaire to assess FCR,[10] only one used a prospective design but with 2 time points only,[9] and another one had a much smaller proportion of patients with high FCR (5.1%)[11] as compared with the others (58-70%).[7,8,10] Further, only a limited range of services and variables were measured, which were sometimes combined into broad categories (eg, psychological therapies which included relaxation techniques, self-help groups, spiritual healing). Interpreting results of medication usage is also limited given that it was calculated using the number and dosage of medications taken in the past week only and because all medications were lumped into 1 category.[7]

This is a secondary analysis of a longitudinal study on the epidemiology of cancer-related insomnia conducted in a large sample of patients with mixed cancer sites.[12,13] The goal of the current study was to examine the association of clinical levels of FCR with the utilization of health care services and medication usage, at 6 time points over a period of 18 months. It was hypothesized that clinical FCR would be significantly associated with greater rates of professional consultations and a higher usage of psychotropic medications.

2 | METHOD

2.1 | Participants

To be eligible for the initial study, participants had to be aged between 18 and 80 years old, to have received a first diagnosis of a non-metastatic cancer, to be scheduled to receive a surgery with a curative intent and to be able to read and understand French. Exclusion criteria were as follows: neoadjuvant treatment, upcoming surgery as part of brachytherapy for prostate cancer, severe cognitive deficits (eg, Alzheimer's disease), severe psychiatric disorder (eg, psychosis), having been diagnosed or treated for a sleep disorder other than insomnia, and visual, auditory, or language deficits impairing the capacity to complete the study measures.

From 2005 to 2007, participants were recruited at L'Hôtel-Dieu de Québec (L'HDQ) and Hôpital du Saint-Sacrement (CHA) in Quebec, Canada. The research ethics committees of L'HDQ (reference number: 5.3.03.06) and the CHA (DR-002-1092) approved the study. Of the 3196 patients solicited to participate in the study, 1519 were excluded and 715 refused to participate, thus giving a sample of 962 patients. Patients who declined participation were older, more likely to have head and neck cancer or urinary or gastro-intestinal cancer (for more details, see Savard et al[12,13]). Interested and eligible patients were invited to give their written informed consent.

2.2 | Study design

This study used a prospective longitudinal design with 6 time points: baseline (peri-operative period; T1) and 2-(T2), 6-(T3), 10-(T4), 14-(T5), and 18-month (T6) assessments. Although patients were recruited before surgery, the majority (81.2%) completed baseline measures post-surgery, on average 20 days after. For subsequent time points, questionnaires that were received more than 3 weeks later than the pre-determined time were not used in the analyses.

2.3 | Measures

2.3.1 | Questionnaire on demographic and medical characteristics and health care utilization

Information on demographic (eg, age) and medical (eg, medical comorbidity) characteristics were collected using a questionnaire. Cancer-related data (eg, cancer site and stage) were taken from the patient's medical record. In the same questionnaire, participants were asked "Which health professional(s) did you consult for personal needs not related to your sleep difficulties" in the past 3 months (T1) or since the last time point (T2-T6). When they had consulted a health care provider, they had to identify the type using the following categories: specialist physician, general practitioner, nurse, pharmacist, social worker, homeopath/osteopath, massage therapist, psychologist, psychiatrist, physiotherapist, acupuncturist, chiropractor, and other. The information on medication usage was collected through phone interviews at each time point again referring to the last 3 months (T1) or since the last study time point (T2 to T6). Participants were asked to "Indicate medications prescribed by a physician for any physical or psychological health problem". They had to specify the medication used, for which indication, the dosage, the frequency of use, and for what period they used it.

2.3.2 | Fear of Cancer Recurrence Inventory—Short form (FCRI-SF)

The FCRI-SF,[3] which is the 9-item severity subscale of the FCRI,[14] was used. Items are rated using a 5-point Likert scale ranging from 0 ("not at all") to 4 ("a great deal") and 1 item is reversed-coded. A cut-off score of 13 or greater is used to indicate clinical FCR (sensitivity:

88%; specificity: 75%).[3] The original French-Canadian version has demonstrated good psychometric properties.[14,15]

2.4 | Procedure

At each time point, participants were asked to complete the demographic and medical questionnaire and the FCRI-SF and to mail them back. A phone interview was then conducted to complete missing data and to collect information on medication usage. More details on the procedure are available elsewhere.[12,13]

2.5 | Data analyses

The SAS version 9.4 for Windows software was used to perform all analyses at a standard alpha level of 5%, 2-sided. Seven patients who had not completed the FCRI-SF at least at 1 time point were excluded from the analyses, for a final sample size of $N = 955$. A latent class growth curve model[16] was performed using the SAS PROC TRAJ macro[17] to explore the presence of different temporal trajectories of FCR. A 2-class model was found to best fit the data and suggested that the diversity of individual temporal trajectories could be gathered into 2 groups: (1) patients with a high and stable level of FCR; and (2) patients with a low and stable level of FCR. Given the relative stability of mean FCR scores over time, the subsequent analyses compared patients with and without a clinical level of FCR at baseline using the cut-off score of 13 on the FCRI-SF. Differences on demographic and clinical characteristics between these 2 conditions at baseline were examined using *t*-tests (continuous variables) and chi-square tests (categorical variables).

A series of generalized linear mixed models (GLIMMIX procedure) using a factorial groups (2) × time (6) design, which adjusted for missing data, was then performed to determine the relationship of baseline FCR with the consultation of professionals (yes/no) and psychotropic medication usage (yes/no). Across time points, the rate of missing data on the FCRI-SF ranged between 0.7% and 1.2%. All interactions (significant or not) were decomposed using simple effects (ie, general test for 1 factor according to a specific level of the other factor). The Simultaneous Test Procedure,[18] which adjusts for error inflation, was used to correct the alpha level. This procedure consists of adding alphas for the main effects (.05 for interaction and .05 for baseline FCR = .10) divided by the number of planned comparisons (ie, the 6 time points; corrected alpha level set at = .10/6 = .0167). The utilization of health care services was coded as a dichotomous variable; hence, a binomial distribution was used. Professionals consulted were grouped into 1 of the following 3 categories: (1) medical (ie, specialist physician, general practitioner, nurse, pharmacist, physiotherapist); (2) psychosocial (ie, psychologist, psychiatrist, social worker); and (3) CAM (ie, homeopath/osteopath, massage therapist, chiropractor, acupuncturist, and other). For the usage of psychotropic medications, analyses were performed for these 2 categories: anxiolytics/hypnotics and antidepressants. To further investigate the relationship between consultation of professionals and usage of psychotropic medications, odds ratios (OR) were calculated, and significance was concluded based on their 95% confidence intervals.

3 | RESULTS

3.1 | Descriptive statistics

3.1.1 | Demographic and clinical characteristics

Table 1 presents participants' demographic and clinical characteristics. Participants were 57 years old on average (23-79), were mostly women (64.4%) and married/cohabitating (67.4%), and mostly had an income between 20 001$ and 60 000$ (CDN) (53.3%), which correspond to 15 978$ and 47 934$ US at the time of manuscript writing. The most common cancer sites were breast (48.3%) and prostate (27.3%) and, for the most part, participants had a stage 1 (35.2%) or stage 2 (37.2%) cancer. Significant differences were found between clinical and non-clinical FCR groups on age, sex, main occupation, and cancer site. Younger participants, those with a female sex and a breast cancer diagnosis, and those working or on sick leave were more likely to display clinical levels of FCR.

3.1.2 | FCR and utilization of health care services

FCRI-SF scores at baseline ranged between 0 and 35, with a mean score exceeding the clinical threshold of 13 ($M = 14.5$; $SD = 7.72$). Patients with a clinical level of FCR at baseline represented 56.2% of the sample ($n = 537$). Among the total sample, 94.4% of the patients reported having consulted a health care professional, and 48.9% used a psychotropic medication at least at 1 time point during the study. Table 2 provides details on mean rates of consultations and usage of psychotropic medications at each time point and across the 18-month period.

3.2 | Relationship between FCR and consultation of professionals

3.2.1 | Medical professionals

Figure 1A shows that consultation rates of medical professionals increased in both groups (clinical FCR vs non-clinical FCR at baseline) from T2 to T5 and that participants with clinical FCR at baseline consulted medical professionals in a greater proportion from T2 to T6. Results of the generalized mixed models analysis showed significant group, $F(1, 953) = 4.09$, $P = .04$, and time effects, $F(5, 3868) = 11.66$, $P < .0001$ on this variable, but a non-significant group × time interaction, $F(5, 3868) = 0.94$, $P = .45$. None of the simple effects was significant. Across the 18-month period, medical professionals were consulted by 66.2% of participants with clinical FCR as compared with 62.5% of those with non-clinical FCR. Patients who consulted medical professionals at a specific time point were significantly more likely to report using anxiolytics/hypnotics (OR = 1.60; 95% CI = 1.39 - 1.85) and antidepressants (OR = 2.42; 95% CI = 1.98 - 2.97) at the same time point.

3.2.2 | Psychosocial professionals

As shown in Figure 1B, patients with clinical FCR consulted psychosocial professionals in a greater proportion than those with a non-clinical level and consultation rates of this type of professionals were particularly high at T2 and T3, overall. Significant group, $F(1, 953) = 6.83$, $P = .009$ and time, $F(5, 3868) = 5.23$, $P < .0001$, effects were found on this variable, but the group × time interaction was not significant,

TABLE 1 Participants' demographic and clinical characteristics (*N* = 962)

Variable	All Participants	Non-clinical FCR	Clinical FCR	Group Comparisons	
		n (%)/ *M* (*SD*)		χ^2 or *t* or *F*	*P* value
Sex (% women)	619 (64.4)	236 (56.5)	378 (70.4)	19.87	<.001
Age (yrs)	57.0 (9.9)	57.9 (9.8)	56.4 (10.0)	2.31	.02
Education (*n* = 945)				1.85	.76
Elementary or less	67 (7.1)	30 (7.3)	37 (6.9)		
High school	392 (41.4)	177 (42.9)	214 (40.1)		
College	237 (25.0)	105 (25.4)	132 (24.7)		
University	249 (26.3)	100 (24.2)	149 (27.9)		
Marital status (*n* = 955)				0.06	.97
Married/cohabiting	644 (67.4)	281 (67.2)	362 (67.5)		
Single	100 (10.5)	45 (10.8)	55 (10.3)		
Divorced/separated/widowed	211 (22.1)	92 (22.0)	119 (22.2)		
Main occupation (*n* = 951)				9.73	.05
Working (full/part time)	377 (39.6)	160 (38.3)	217 (40.6)		
Family work	41 (4.3)	12 (2.9)	29 (5.4)		
Sick leave	140 (14.7)	53 (12.7)	86 (16.1)		
Retired	369 (38.7)	180 (43.1)	189 (35.4)		
Unemployed	24 (2.5)	13 (3.1)	13 (2.4)		
Annual family income (Canadian dollars; *n* = 809)				1.60	.81
$20 000 and less	135 (16.7)	55 (15.5)	80 (17.6)		
$20 001 to $40 000	267 (33.0)	120 (33.9)	147 (32.4)		
$40 001 to $60 000	164 (20.3)	75 (21.2)	88 (19.4)		
$60 001 to $ 80 000	115 (14.2)	52 (14.7)	63 (13.9)		
$80 001 and higher	128 (15.8)	52 (14.7)	76 (16.7)		
Cancer site				19.82	.001
Breast	465 (48.3)	173 (41.4)	288 (53.6)		
Prostate	263 (27.3)	139 (33.3)	122 (22.7)		
Gynecological	111 (11.5)	47 (11.2)	64 (11.9)		
Head and neck	22 (2.3)	8 (1.9)	14 (2.6)		
Urinary and gastro-intestinal	69 (7.2)	34 (8.1)	35 (6.5)		
Other	32 (3.3)	17 (4.1)	14 (2.6)		
Cancer stage				7.51	.19
0	44 (4.6)	14 (3.4)	30 (5.6)		
I	339 (35.2)	137 (32.8)	200 (37.2)		
II	358 (37.2)	157 (37.6)	197 (36.7)		
III	175 (18.2)	88 (21.1)	86 (16.0)		
IV	25 (2.6)	12 (2.9)	13 (2.4)		
Unspecified	21 (2.2)	10 (2.4)	11 (2.1)		
FCRI-SF (0-36)					
T1	14.5 (7.7)	7.4 (3.6)	19.9 (5.3)	950.05	<.0001
T2	12.4 (7.3)	6.9 (3.8)	18.8 (4.8)	247.84	<.0001
T3	12.1 (7.3)	6.7 (3.9)	18.5 (4.9)	229.59	<.0001
T4	11.8 (7.4)	6.5 (3.9)	18.4 (4.9)	239.29	<.0001
T5	11.4 (7.5)	6.0 (4.0)	18.3 (4.7)	232.07	<.0001
T6	11.3 (7.4)	6.0 (4.1)	18.2 (4.6)	240.43	<.0001

Note. FCRI-SF = Fear of Cancer Recurrence Inventory—Short form. Clinical FCR = FCRI-SF ≥ 13. Error degree of freedom (DF) = 954 for all tests except FCRI-SF (DF = 4812).

F(5, 3868) = 0.94, *P* = .45. After correcting the alpha level, only 1 significant simple effect was found and revealed that participants with clinical FCR consulted significantly more psychosocial professionals at T4 (9.6%) than those with a non-clinical level (4.2%), *F*(1, 3868) = 8.30, *P* = .004. Across all time points, participants with clinical FCR consulted a psychosocial professional in a proportion of 7.9% versus 4.7% for those with a non-clinical level. Patients who consulted a psychosocial professional reported a significantly higher usage of anxiolytics/

TABLE 2 Proportion of participants consulting professionals and using psychotropic medications at each time point and overall (%)

Variable	T1	T2	T3	T4	T5	T6	All Time Points
Medical professionals	60.2	54.9	65.2	66.6	69.8	68.5	92.8
Psychosocial professionals	6.7	7.9	8.4	6.4	5.5	3.3	18.3
CAM professionals	12.1	9.8	13.1	14.3	14.5	17.0	32.8
Anxiolytics/hypnotics	30.6	28.9	25.1	23.8	23.6	21.8	42.9
Antidepressants	10.8	12.3	13.4	14.7	15.8	15.5	19.2

Abbreviation: CAM, Complementary and Alternative Medicine.

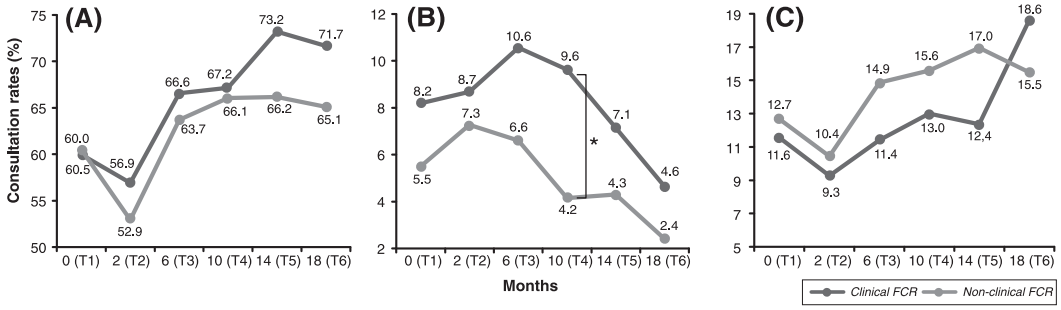

FIGURE 1 Evolution of consultation rates of professionals during the study comparing patients with vs without clinical FCR at baseline. A, Consultation of medical professionals. B, Consultation of psychosocial professionals. C, Consultation of CAM professionals. * $P < .05$

hypnotics (OR = 2.89; 95% CI = 2.30 - 3.64) and antidepressants (OR = 4.81; 95% CI = 3.77 - 6.13) at the same time point.

CAM Professionals. Consultation rates of CAM professionals generally decreased from T1 to T2 but increased between T2 and T6 (see Figure 1C). Thus, only a significant time effect was found, $F(5, 3868) = 4.59$, $P = .0004$. No significant group, $F(1, 953) = 1.25$, $P = .264$, and group × time interaction, $F(5, 3868) = 1.67$, $P = .138$, were found and simple effects were all non-significant. Overall, 12.5% of patients with clinical FCR at baseline consulted CAM professionals as compared with 14.2% of patients with a non-clinical level. Participants who used CAM services had a significantly greater risk of using antidepressants at the same time point (OR = 1.45; 95% CI = 1.16 - 1.82), but not anxiolytics/hypnotics (OR = 1.18; 95% CI = 0.97 - 1.42).

3.3 | Relationship between FCR and usage of psychotropic medications

When combining all psychotropic medications together, 54.7% of the participants with clinical FCR at baseline were users at least on 1 occasion during the study, as compared with 41.1% of those with low FCR.

3.3.1 | Anxiolytics/hypnotics

Usage rates of anxiolytics/hypnotics decreased over time in both groups and were greater in patients with high FCR (see Figure 2A). Averaged across all assessments, participants with clinical FCR used anxiolytics/hypnotics in a proportion of 29.6% as compared with 21.8% for those with non-clinical FCR. Results of the generalized mixed models analysis on this variable showed significant group, $F(1, 951) = 9.88$, $P = .0017$, and time effects, $F(5, 3701) = 7.30$, $P < .0001$, but the group × time interaction effect was non-significant, $F(5, 3701) = 0.26$, $P = .93$. Significant simple effects revealed that participants with clinical FCR used significantly more anxiolytics/hypnotics than participants with a non-clinical level at T1 (35.9% vs 25.7%; $F[1, 3701] = 11.3$, $P = .0008$), T3 (29.3% vs 21.4%; $F[1, 3701] = 6.87$, $P = .009$), and T4 (28.0 vs 20.2%; $F[1, 3701] = 6.58$, $P = .01$).

3.3.2 | Antidepressants

Conversely, the usage rates of antidepressants generally increased over time in both groups (see Figure 2B). Again, usage rates of

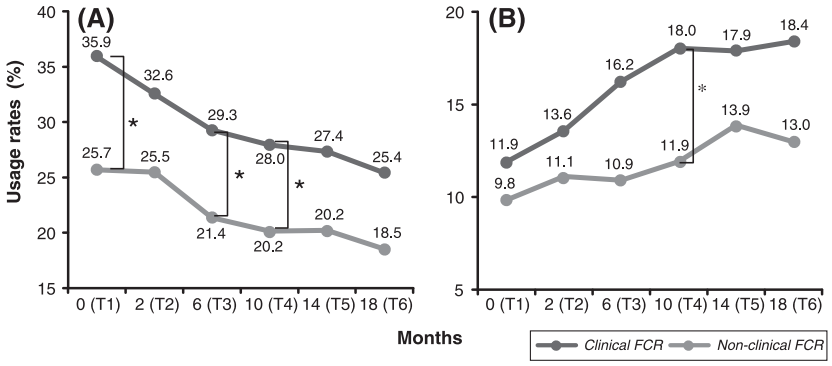

FIGURE 2 Evolution of usage rates of psychotropic medications during the study comparing patients with vs without clinical FCR at baseline. A, Usage of anxiolytics/hypnotics. B, Usage of antidepressants. * $P < .05$

antidepressants were greater in patients with clinical FCR at baseline. Significant group, $F(1, 951) = 3.85$, $P = .0499$, and time, $F(5, 3701) = 5.23$, $P < .0001$, effects were found. Specifically, 15.8% of the clinical FCR group used antidepressants during the 18 months of the study as compared with 11.7% of those with a non-clinical level. No significant interaction effect was found, $F(5, 3701) = 1.49$, $P = .19$. Only 1 significant simple effect was found, indicating that participants with clinical FCR at baseline used more antidepressants at T4 (18.0% vs 11.9%), $F(1, 3701) = 5.92$, $P = .015$.

4 | DISCUSSION

Results of this study mostly supported our hypothesis that a clinical level of FCR would be linked to greater rates of consultation of medical and psychosocial professionals and psychotropic medications usage. These results suggest that patients with high FCR, on average, tend to seek reassurance from medical and psychosocial professionals, rather than avoiding contacts with them. Although medical appointments are an integral part of the cancer care trajectory, as expected, consultation rates were significantly and consistently greater for those with elevated FCR, which is in line with previous findings.[7,8,19,20] This could be explained by the fact that patients with FCR tend to report more symptoms and to worry more about them.[5,6] Our results also suggest that these greater consultation rates of medical professionals could at least be partly due to a higher usage of psychotropic medications, which require regular medical monitoring.

Consultation rates of psychosocial professionals were higher around T2 and T3 and decreased afterwards, which indicates that patients have a greater need to consult soon during the cancer trajectory. The post-surgery phase is characterized by many challenges such as the administration of adjuvant therapy and management of treatment side effects and loss of regular contact with health care providers,[21,22] which may be linked to FCR by reminding patients of the presence of the disease or by limiting opportunities for using reassurance behaviors. Accordingly, it previously was found that at post-treatment, FCR was the top-rated source of distress.[23]

Utilization of CAM services/products was the only type of consultation for which no association was found with the FCR level. This result is contrary to our hypothesis and inconsistent with previous findings,[8-10] which can be explained by differences in methodologies. The use of CAM was much more common in these studies (35% to 60%)[8-10] than in ours (9.8% to 17.0% of patients overall). Also, 2 of the previous studies were conducted in women with early-stage breast cancer only, and it has been shown that women in general, and those with this type of cancer specifically, are more likely to use CAM.[24-26] This could also be attributable to the fact that previous studies assessed a larger variety of CAM services/products.

Utilization of psychotropic medications evolved differently for anxiolytics/hypnotics and antidepressants with an overall reduction in the former and an increase in the latter. Generally indicated for the short-term relief of acute conditions,[27] anxiolytics/hypnotics were mostly used in the first few months in this study, possibly to better cope with anxiety and sleep difficulties that are common at this time.[12,13,28] Given that psychological distress was found to be fairly stable over time after diagnosis and treatment,[23,29] the greater usage of antidepressants later during the cancer care trajectory could be due to their other indications such as the management of hot flashes and pain that may have resulted from cancer treatments.[30] As expected, participants with clinical FCR, who are more likely to suffer from anxiety, sleep difficulties, and depression,[3,4,31] utilized significantly more psychotropic medications than those with non-clinical levels.

4.1 | Study limitations

This study has some limitations. Generalization of the results may be limited by the fact that patients who declined participation presented different demographic and cancer characteristics and that only patients with surgery as their first treatment were included. On the other hand, a population-based approach was adopted to recruit patients and large inclusion criteria were used (eg, mixed cancer sites). Differences on health care utilization that were obtained between the 2 groups could be at least partly due to the demographic profile of patients who are at risk for FCR (ie, younger age, female sex) rather than FCR *per se*. Also, time points were not adjusted to each patient's treatment trajectory, making it impossible to delineate the impact of surgery and adjuvant treatments on the association between FCR and health care use. Finally, the question that was asked to document participants' consultation of professionals was probably too vague and may have misled some participants as to whether or not they had to report consultations that were part of their regular medical follow-up.

4.2 | Clinical implications

This is the first large-scale longitudinal study investigating associations between clinical levels of FCR and use of different health care services over an extended period of time. In summary, findings confirm that elevated FCR is related to a greater utilization of health care services. This is in line with previous findings indicating that health-related anxiety generates significant costs for the health care system.[32] In the future, it would be important to determine the magnitude of the costs entailed for the health care system and the patients themselves due to FCR specifically. From a clinical standpoint, results of this study highlight the importance of early detection of FCR and the need to develop and offer interventions that effectively treat it.

ACKNOWLEDGEMENTS

The initial longitudinal study was supported by a research grant from the Canadian Institutes of Health Research (MOP-69073). The authors wish to thank the participants and all people who participated in the recruitment, the data collection, or the data entry.

CONFLICT OF INTEREST

None declared.

ORCID

Alexandra Champagne http://orcid.org/0000-0001-7634-852X

REFERENCES

1. Lebel S, Ozakinci G, Humphris G, et al. From normal response to clinical problem: definition and clinical features of fear of cancer recurrence. *Support Care Cancer*. 2016;24(8):3265-3268.
2. Simard S, Thewes B, Humphris G, et al. Fear of cancer recurrence in adult cancer survivors: a systematic review of quantitative studies. *J Cancer Surviv*. 2013;7(3):300-322.
3. Simard S, Savard J. Screening and comorbidity of clinical levels of fear of cancer recurrence. *J Cancer Surviv*. 2015;9(3):481-491.
4. Skaali T, Fosså SD, Bremnes R, et al. Fear of recurrence in long-term testicular cancer survivors. *Psychooncology*. 2009;18(6):580-588.
5. Custers JA, Gielissen MF, Janssen SH, de Wilt JH, Prins JB. Fear of cancer recurrence in colorectal cancer survivors. *Support Care Cancer*. 2016;24(2):555-562.
6. Stark D, Kiely M, Smith A, Morley S, Selby P, House A. Reassurance and the anxious cancer patient. *Br J Cancer*. 2004;91(5):893-899.
7. Lebel S, Tomei C, Feldstain A, Beattie S, McCallum M. Does fear of cancer recurrence predict cancer survivors' health care use? *Support Care Cancer*. 2013;21(3):901-906.
8. Thewes B, Butow P, Bell ML, et al. Fear of cancer recurrence in young women with a history of early-stage breast cancer: a cross-sectional study of prevalence and association with health behaviours. *Support Care Cancer*. 2012;20(11):2651-2659.
9. Burstein HJ, Gelber S, Guadagnoli E, Weeks JC. Use of alternative medicine by women with early-stage breast cancer. *N Engl J Med*. 1999;340(22):1733-1739.
10. Montazeri A, Sajadian A, Ebrahimi M, Haghighat S, Harirchi I. Factors predicting the use of complementary and alternative therapies among cancer patients in Iran. *Eur J Cancer Care*. 2007;16(2):144-149.
11. Sarkar S, Sautier L, Schilling G, Bokemeyer C, Koch U, Mehnert A. Anxiety and fear of cancer recurrence and its association with supportive care needs and health-care service utilization in cancer patients. *J Cancer Surviv*. 2015;9(4):567-575.
12. Savard J, Ivers H, Villa J, Caplette-Gingras A, Morin CM. Natural course of insomnia comorbid with cancer: an 18-month longitudinal study. *J Clin Oncol*. 2011;29(26):3580-3586.
13. Savard J, Villa J, Ivers H, Simard S, Morin CM. Prevalence, natural course, and risk factors of insomnia comorbid with cancer over a 2-month period. *J Clin Oncol*. 2009;27(31):5233-5239.
14. Simard S, Savard J. Fear of Cancer Recurrence Inventory: development and initial validation of a multidimensional measure of fear of cancer recurrence. *Support Care Cancer*. 2009;17(3):241-251.
15. 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.
16. Nagin DS. Analyzing developmental trajectories: a semiparametric, group-based approach. *Psychol Methods*. 1999;4(2):139-157.
17. Jones BL, Nagin DS, Roeder K. A SAS procedure based on mixture models for estimating developmental trajectories. *Sociolog Meth Res*. 2001;29(3):374-393.
18. Kirk RE. *Experimental Design: Procedures for the Behavioral Sciences*. 3rd ed. Pacific Grove, CA: Brooks-Cole Publishing Company; 1995.
19. Fergus TA, Valentiner DP. Disease phobia and disease conviction are separate dimensions underlying hypochondriasis. *J Behav Ther Exp Psychiatry*. 2010;41(4):438-444.
20. Barsky AJ, Ettner SL, Horsky J, Bates DW. Resource utilization of patients with hypochondriacal health anxiety and somatization. *Med Care*. 2001;39(7):705-715.
21. Payne DK, Sullivan MD, Massie MJ (Eds). Women's psychological reactions to breast cancer. *Semin Oncol*. 1996;23(1 Suppl 2):89-97.
22. Lethborg CE, Kissane D, Burns WI, Snyder R. "Cast adrift": the experience of completing treatment among women with early stage breast cancer. *J Psychosoc Oncol*. 2000;18(4):73-90.
23. Costanzo E, Lutgendorf S, Mattes M, et al. Adjusting to life after treatment: distress and quality of life following treatment for breast cancer. *Br J Cancer*. 2007;97(12):1625-1631.
24. Fasching PA, Thiel F, Nicolaisen-Murmann K, et al. Association of complementary methods with quality of life and life satisfaction in patients with gynecologic and breast malignancies. *Support Care Cancer*. 2007;15(11):1277-1284.
25. Patterson RE, Neuhouser ML, Hedderson MM, et al. Types of alternative medicine used by patients with breast, colon, or prostate cancer: predictors, motives, and costs. *J Altern Complement Med*. 2002;8(4):477-485.
26. Verhoef MJ, Balneaves LG, Boon HS, Vroegindewey A. Reasons for and characteristics associated with complementary and alternative medicine use among adult cancer patients: a systematic review. *Integr Cancer Ther*. 2005;4(4):274-286.
27. National Institute for Health and Care Excellence. Generalised anxiety disorder and panic disorder in adults: management 2011. [Available from: https://www.nice.org.uk/guidance/CG113
28. Green BL, Rowland JH, Krupnick JL, et al. Prevalence of posttraumatic stress disorder in women with breast cancer. *Psychosomatics*. 1998;39(2):102-111.
29. Desplenter F, Bond C, Watson M, et al. Incidence and drug treatment of emotional distress after cancer diagnosis: a matched primary care case-control study. *Br J Cancer*. 2012;107(9):1644-1651.
30. Caruso R, Grassi L, Nanni MG, Riba M. Psychopharmacology in psycho-oncology. *Curr Psychiatry Rep*. 2013;15(9):393.
31. Berrett-Abebe J, Cadet T, Pirl W, Lennes I. Exploring the relationship between fear of cancer recurrence and sleep quality in cancer survivors. *J Psychosoc Oncol*. 2015;33(3):297-309.
32. Fink P, Ørnbøl E, Christensen KS. The outcome of health anxiety in primary care. A two-year follow-up study on health care costs and self-rated health. *PLoS One*. 2010;5(3):e9873.

How to cite this article: Champagne A, Ivers H, Savard J. Utilization of health care services in cancer patients with elevated fear of cancer recurrence. *Psycho-Oncology*. 2018;27:1958–1964. https://doi.org/10.1002/pon.4748