Breast Cancer Res Treat (2014) 145:205–210
DOI 10.1007/s10549-014-2929-3

EPIDEMIOLOGY

Contribution of problem-solving skills to fear of recurrence in breast cancer survivors

Tatuo Akechi · Kanae Momino · Toshinari Yamashita · Takashi Fujita · Hironori Hayashi · Nobuyuki Tsunoda · Hiroji Iwata

Received: 15 March 2014 / Accepted: 18 March 2014 / Published online: 30 March 2014

Abstract Although fear of recurrence is a major concern among breast cancer survivors after surgery, no standard strategies exist that alleviate their distress. This study examined the association of patients' problem-solving skills and fear of recurrence and psychological distress among breast cancer survivors. Randomly selected, ambulatory, female patients with breast cancer participated in this study. They were asked to complete the Concerns about Recurrence Scale (CARS) and the Hospital Anxiety and Depression Scale. Multiple regression analyses were used to examine their associations. Data were obtained from 317 patients. Patients' problem-solving skills were significantly associated with all subscales of fear of recurrence and overall worries measured by the CARS. In addition, patients' problem-solving skills were significantly associated with both their anxiety and depression. Our findings warrant clinical trials to investigate effectiveness of psychosocial intervention program, including enhancing patients' problem-solving skills and reducing fear of recurrence among breast cancer survivors.

Keywords Breast cancer · Survivors · Problem-solving skills · Fear of recurrence

T. Akechi (✉)
Department of Psychiatry and Cognitive-Behavioral Medicine, Nagoya City University Graduate School of Medical Sciences, Mizuho-cho, Mizuho-ku, Nagoya, Aichi 467-8601, Japan
e-mail: takechi@med.nagoya-cu.ac.jp

T. Akechi
Division of Palliative Care and Psycho-oncology, Nagoya City University Hospital, Mizuho-cho, Mizuho-ku, Nagoya, Aichi 467-8601, Japan

K. Momino
Nagoya City University Graduate School of Nursing, Mizuho-cho, Mizuho-ku, Nagoya, Aichi 467-8601, Japan

T. Yamashita · T. Fujita · H. Hayashi · N. Tsunoda · H. Iwata
Department of Breast Oncology, Aichi Cancer Center Hospital, 1-1 Kanokoden, Chikusa-ku, Nagoya 464-8681, Japan

T. Yamashita
Tokyo Metropolitan Cancer and Infectious Diseases Center Komagome Hospital, 18-22,Honkomagome 3chome, Bunkyo-ku, Tokyo 113-8677, Japan

H. Hayashi · N. Tsunoda
Department of Breast and Endocrine Surgery, Nagoya University Hospital, 65 Tsurumai-cho, Showa-ku, Nagoya 466-8560, Japan

Introduction

Breast cancer is one of the most common cancers among women all over the world; in particular, in Japan its incidence is continually increasing. At present, approximately 60,000 women develop breast cancer annually in Japan. Advances in early detection and individualized medical treatment have improved the survival of breast cancer patients and enabled them to live with the disease for prolonged periods of time.

Breast cancer survivors experience considerable distress. Their most prevalent unmet needs are psychological [1, 2], where fear of recurrence and spread of cancer are the most common [1–3]. Moreover, according to a previous Japanese study on cancer patients' perceived difficulties in daily life, the most common problem is psychological distress [4]. The study also indicated that nearly half of the cancer survivors experience psychological distress—in particular, anxiety about recurrence or metastases of their cancer [4]. Our previous study indicated that approximately one in four Japanese breast cancer survivors experience clinical anxiety and depression, and that the most common

unmet need among ambulatory breast cancer patients is the "fear of cancer spread"; 63 % of the patients reported the need for help to alleviate this fear [5, 6]. It has also been reported that fear of recurrence decreases the quality of life of breast cancer survivors [7].

Thus, fear of cancer recurrence is one of the most common distressing symptoms for cancer survivors, and appropriate interventions are needed. Although certain recent studies have proposed potential interventions to reduce this fear [7, 8], standard strategies to alleviate this distress do not exist. In addition, although Western studies have systematically reviewed the effectiveness of psychosocial interventions for cancer patients, demonstrating that cognitive behavioral therapy is recommended [9], our clinical experience suggests that most cancer patients do not have extreme distortions of cognition and that traditional cognitive therapeutic interventions are often not appropriate for cancer patients [10]. Our experience also suggests that problem-solving therapy (PST) may be useful for reducing fear of recurrence among breast cancer survivors, although PST does not directly deal with fear or anxiety itself, instead focuses on daily problems [10]. PST is a brief intervention program to help patients to use their own skills and resources to solve their problems by using structured strategy.

Thus, we plan to establish a novel psychosocial intervention program, including PST, for reducing fear of recurrence in breast cancer survivors. However, to the best of our knowledge, there have been no findings about the contribution of patients' problem-solving skills to fear of recurrence among breast cancer survivors. Our study investigated the association between problem-solving skills and psychological distress including fear of recurrence among breast cancer survivors. Our hypothesis was that patients' problem-solving skills are significantly associated with fear of recurrence, anxiety, and depression.

Methods

Participants

The participants were ambulatory females with breast cancer visiting the outpatient department of Aichi Cancer Center Hospital, Japan.

The following were the eligibility criteria for the study: women (a) with a diagnosis of invasive breast cancer and who were informed of the cancer diagnosis, (b) who were disease-free survivors after mastectomy or partial mastectomy, and (c) above 20 years. The exclusion criteria were (a) severe mental or cognitive disorders, (b) inability to understand the Japanese language, and (c) patients considered by their oncologists as physically or mentally incapable of participation.

Procedure

Oncologists consecutively identified all eligible patients in their ambulatory clinic and briefly explained the survey to them when they visited the hospital. If they were interested in the study, the oncologists provided them with the questionnaires. Instead of a written consent, patients who agreed to participate in the study, after reading an explanatory document on it, were asked to complete the questionnaire anonymously at home and send them back by mail. Patients who did not wish to participate in the survey returned the questionnaires stating "no participation."

This study was approved by the Institutional Review Board and Ethics Committee of Aichi Cancer Center and was conducted in accordance with the principles laid down in the Helsinki Declaration.

Instruments

Japanese version of the Concerns about Recurrence Scale (CARS-J)

CARS-J is a 26-item, self-report scale, originally developed in the USA [11]. The reliability and validity of CARS-J has been confirmed among Japanese breast cancer patients, although factor structure is slightly different from the original study, suggesting some cross-cultural differences with regard to the construct validity of fear of recurrence [12]. CARS-J assesses the overall fear of breast cancer recurrence and four domains of specific fear of recurrence. Overall fear consists of four items: questions on frequency, potential for upset, consistency, and intensity of fear. The four domains are Health and Death Worries (13 items that refer to concern about future treatment, emotional upset, physical heath, planning activities, loss of breast, and the possibility that recurrence of breast cancer could lead to death); Womanhood Worries (6 items referring to femininity, sexuality, womanhood, body image, and romantic relationships); Self-valued Worries (5 items referring to identity, spirituality or faith, self-confidence, and relationships with friends and family); and Role Worries (2 items pertaining to roles and responsibilities at work and at home).

Japanese version of the Social Problem-Solving Inventory-Revised Short Form (SPSI-R:S)

SPSI-R:S is a 25-item, self-report scale that was developed to assess problem-solving skills [13–15]. It includes five scales: Positive Problem Orientation (PPO, 4 items); Negative Problem Orientation (NPO, 5 items); Rational Problem Solving (RPS, 5 items); Impulsivity/Carelessness

style (IPC, 5 items); and Avoidance Style (AS, 5 items). The PPO scale assesses general cognitive skills, such as the tendency to view problems in a positive light, to see them as challenges rather than as threats, and to be optimistic regarding the existence of a solution and one's ability to detect and implement effective solutions. In contrast, the NPO scale assesses the presence of maladaptive problem-solving approaches and cognitive-emotional tendencies that prevent effective problem solving. The RPS scale assesses an individual's tendency to use effective problem-solving techniques systematically and deliberately. The ICS scale evaluates a tendency to solve problems by making overly quick decisions in an impulsive, incomplete, and haphazard manner. The AS scale measures maladaptive patterns of problem solving characterized by general passivity or putting the problem off and waiting for problems to resolve by themselves [16, 17]. Social problem-solving score (SPS) is calculated as PPO/4+ (20− NPO)/5 + RPS/5+ (20− ICS)/5+ (20− ACS)/5; a higher score indicates better problem-solving skills.

Hospital anxiety and depression scale (HADS)

HADS is a 14-item, self-report questionnaire that was developed to evaluate psychological distress, including anxiety and depression, in medically ill patients and does not contain questions regarding physical symptoms [18]. Participants are asked to rate their feelings during the previous week using a four-point Likert scale. HADS includes an anxiety and a depression subscale (0–21 points each), and the total score ranges from 0 to 42. Higher scores indicate a more severe degree of depression and anxiety. The Japanese version of HADS has been validated for cancer populations [19].

Sociodemographic and clinical factors

An *ad hoc* self-administered questionnaire was used to obtain information on sociodemographic status such as age, marital status, employment status, educational level, types of treatments received, and time since the operation.

Statistical analysis

First, to investigate the association between patients' problem-solving skills and fear of recurrence and psychological distress in univariate analysis, Pearson's correlation coefficients between SPS and subscales of CARS-J and SPS and anxiety and depression scores of the HADS were calculated. Second, to investigate the association between problem-solving skills and fear of recurrence and psychological distress after adjusting for potential confounding factors in multivariate analysis, multiple regression analyses were conducted, including age, marital status, and education as independent variables.

A p value of less than 0.05 was adopted as the significance level in all statistical analyses, and all p-values reported were two-tailed. All statistical procedures were conducted using IBM SPSS Statistics version 19 software for Windows (SPSS Inc., 2010).

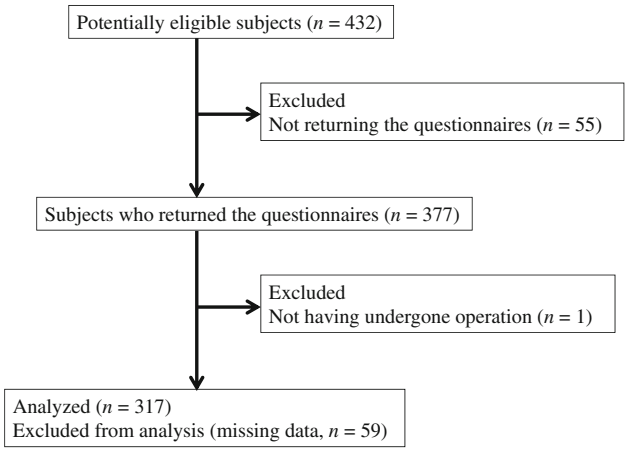

Fig. 1 Flow diagram of the analyzed subjects

Results

Among the 432 patients who met the eligibility criteria, a total of 377 patients (87 %) returned the questionnaires. A total of 60 patients were excluded because of not having undergone operation and missing data. Data from the remaining 317 patients (73 %) were analyzed. Flow diagram of the analyzed subjects is shown in Fig. 1.

Patients' characteristics

Participants' characteristics are shown in Table 1. The median age of the study population was 55 years. A majority of the women were married (79 %), and approximately half of them had a full- or part-time job (47 %). More than half the number of participants reported experience of either chemotherapy or hormonal therapy. In addition, 23 and 33 % of the participants had undergone operation less than 1 year and 1–3 years earlier, respectively.

Association between problem-solving skills and fear of recurrence and psychological distress

The results of univariate analyses are shown in Table 2. SPS were significantly associated with all dimensions of fear of recurrence, except for Role Worries and

Table 1 Characteristics of the study participants ($n = 317$)

Characteristics		*N*	(%)
Age	Mean: 55 ($SD = 10$) Median: 55 (range, 31–80)		
Sex	Female	317	100
Marital status	Married	251	79
	Others	66	21
Job	Full-time	75	24
	Part-time	73	23
	Others	159	50
	Unknown	10	3
Education	High school	172	54
	College/university	139	44
	Unknown	6	2
Anticancer treatment	Chemotherapy	206	55
	Radiation therapy	149	40
	Hormone therapy	241	64
Duration since operation	<1 year	72	23
	≥1 to <3 years	105	33
	≥3 years	135	43
	Unknown	5	2

psychological distress. Correlation coefficients between problem-solving skills and the subscales of fear of recurrence ranged from −0.10 to −0.30. Correlation coefficients between problem-solving skills and anxiety and depression were −0.29 and −0.33, respectively. The results of multivariate analyses are shown in Table 3. SPS were significantly associated with all dimensions of fear of recurrence and psychological distress. Among adjusted variables, younger age were significantly associated with Overall Worries, Health and Death Worries, Womanhood Worries, and Role Worries, while age was not significantly associated with Self-valued Worries.

Discussion

The present findings support the hypothesis that patients' problem-solving skills contributed to the development of fear of recurrence, anxiety, and depression among breast cancer survivors. These results suggest that a psychosocial intervention program enhancing patients' problem-solving skills can ameliorate patients' psychological distress, including fear of recurrence.

As mentioned earlier, PST is a brief intervention program to help patients use their own skills and resources to solve their problems by using structured strategy. In addition, PST program specifically for cancer patients is already available [10, 20–22], while appropriate modification for addressing fear of recurrence experienced by breast cancer survivors should be needed. In addition, since association between patients' problem-solving skills and fear of recurrence are not so strong (e.g., correlation coefficients between problem-solving skills and subscales of fear of recurrence ranged from −0.10 to −0.30), only brief PST may not be a strong intervention to reduce patients' fear of recurrence. Novel intervention program including other therapeutic techniques such as group therapy and behavioral activation as well as PST can be more appropriate to effectively ameliorate patients' fear of recurrence. However, our findings warrant clinical trials to investigate effectiveness of psychosocial intervention program, including enhancement of patients' problem skills, on patients' fear of recurrence among breast cancer survivors.

We would like to comment on patients' demographic factors that are associated with fear of recurrence. In particular, our findings demonstrate that younger age is an important factor that contributes to developing patients' fear of recurrence. Many previous studies have suggested that younger breast cancer patients can experience stronger psychological distress; [23–25] these findings suggest that target population should include younger breast cancer patients.

The present study has several limitations. First, the investigation was cross-sectional in design, precluding any conclusions with regard to causality. Second, because fear of recurrence seems to be influenced by the patients' cultural backgrounds, the findings might not be applicable to patients of other cultures. Finally, since the present study

Table 2 Associations between problem-solving skills and fear of recurrence and psychological distress—correlation coefficients

	Fear of recurrence					Psychological distress	
	Overall worries	Health and death worries	Womanhood worries	Self-valued worries	Role worries	Anxiety	Depression
Problem-solving skills	−0.15*	−0.16*	−0.19*	−0.30*	−0.10	−0.29*	−0.33*

* $p < 0.01$

Table 3 Associations between problem-solving skills and fear of recurrence and psychological distress—multiple regression analyses

Dependent variables	Independent variables	Coefficient (B)	Standardized coefficient (Beta)	*t*	*p*	R^2
Overall worries	Problem-solving skills	−0.11	−0.19	−3.23	<0.01	0.06
	Age	−0.02	−0.16	−2.72	<0.01	
	Marital status	0.19	0.06	1.06	0.29	
	Education	0.09	0.03	0.59	0.56	
Health and death worries	Problem-solving skills	−0.09	−0.20	−3.57	<0.01	0.13
	Age	−0.03	−0.26	−4.69	<0.01	
	Marital status	0.22	0.09	1.69	0.09	
	Education	0.25	0.13	2.27	0.02	
Womanhood worries	Problem-solving skills	−0.09	−0.21	−3.78	<0.01	0.09
	Age	−0.02	−0.24	−4.14	<0.01	
	Marital status	−0.08	−0.03	−0.59	0.55	
	Education	0.02	0.01	0.20	0.84	
Self-valued worries	Problem-solving skills	−0.14	−0.32	−5.84	<0.01	0.11
	Age	−0.01	−0.10	−1.72	0.09	
	Marital status	0.16	0.07	1.29	0.20	
	Education	0.18	0.09	1.64	0.10	
Role worries	Problem-solving skills	−0.09	−0.16	−2.84	<0.01	0.10
	Age	−0.03	−0.21	−3.71	<0.01	
	Marital status	0.34	0.11	2.09	0.04	
	Education	0.34	0.14	2.41	0.02	
Anxiety	Problem-solving skills	−0.46	−0.31	−5.45	<0.01	0.10
	Age	−0.03	−0.10	−1.75	0.08	
	Marital status	0.03	0.003	0.06	0.95	
	Education	0.45	0.06	1.10	0.27	
Depression	Problem-solving skills	−0.52	−0.31	–5.65	<0.01	0.13
	Age	−0.04	–0.12	–2.18	0.03	
	Marital status	−1.25	−0.14	−2.58	0.01	
	Education	0.28	0.04	0.66	0.51	

was conducted at one institution, an institutional bias might exist.

Acknowledgments This study was supported in part by a Grant-in-Aid for Scientific Research (B) from the Japanese Ministry of Education, Culture, Science, and Technology and a Grant-in-Aid for Cancer Research from the Japanese Ministry of Labor, Health, and Welfare. Toshinari Yamashita has received remuneration from Chugai Pharmaceutical Company.

References

1. Hodgkinson K, Butow P, Hunt GE, Pendlebury S, Hobbs KM, Wain G (2007) Breast cancer survivors' supportive care needs 2–10 years after diagnosis. Support Care Cancer 15(5):515–523. doi:10.1007/s00520-006-0170-2
2. Baker F, Denniston M, Smith T, West MM (2005) Adult cancer survivors: how are they faring? Cancer 104(11 Suppl):2565–2576. doi:10.1002/cncr.21488
3. Armes J, Crowe M, Colbourne L, Morgan H, Murrells T, Oakley C, Palmer N, Ream E, Young A, Richardson A (2009) Patients' supportive care needs beyond the end of cancer treatment: a prospective, longitudinal survey. J Clin Oncol 27(36):6172–6179. doi:10.1200/JCO.2009.22.5151JCO.2009.22.5151
4. Yamaguchi K (2006) Gan to mukiatta 7885 nin no koe
5. Akechi T, Okuyama T, Endo C, Sagawa R, Uchida M, Nakaguchi T, Akazawa T, Yamashita H, Toyama T, Furukawa TA (2011) Patient's perceived need and psychological distress and/or quality of life in ambulatory breast cancer patients in Japan. Psychooncology 20(5):497–505. doi:10.1002/pon.1757
6. Akechi T, Okuyama T, Imoto S, Yamawaki S, Uchitomi Y (2001) Biomedical and psychosocial determinants of psychiatric morbidity among postoperative ambulatory breast cancer patients. Breast Cancer Res Treat 65(3):195–202
7. Mishel MH, Germino BB, Gil KM, Belyea M, Laney IC, Stewart J, Porter L, Clayton M (2005) Benefits from an uncertainty management intervention for African-American and Caucasian older long-term breast cancer survivors. Psychooncology 14(11):962–978. doi:10.1002/pon.909
8. Germino BB, Mishel MH, Crandell J, Porter L, Blyler D, Jenerette C, Gil KM (2013) Outcomes of an uncertainty management intervention in younger African American and Caucasian breast cancer survivors. Oncol Nurs Forum 40(1):82–92. doi:10.1188/13.ONF.82-92C283254749H888R8

9. Williams S, Dale J (2006) The effectiveness of treatment for depression/depressive symptoms in adults with cancer: a systematic review. Br J Cancer 94(3):372–390
10. Akechi T, Hirai K, Motooka H, Shiozaki M, Chen J, Momino K, Okuyama T, Furukawa TA (2008) Problem-solving therapy for psychological distress in Japanese cancer patients: preliminary clinical experience from psychiatric consultations. Jpn J Clin Oncol 38(12):867–870. doi:10.1093/jjco/hyn115
11. Vickberg SM (2003) The Concerns About Recurrence Scale (CARS): a systematic measure of women's fears about the possibility of breast cancer recurrence. Ann Behav Med 25(1):16–24
12. Momino K, Akechi T, Yamashita T, Fujita T, Hayashi H, Tsunoda N, Miyashita M, Iwata H Psychometric properties of the Japanese version of the Concerns about Recurrence Scale (CARS-J). Jpn J Clin Oncol (in press)
13. Dz TJ, Nezu AM, Maydeu-Olivares AB (2002) Social problem-solving inventory-revised (SPSI-R). Multi-Health Systems Inc., New York
14. Sato H, Takahashi F, Matsuo M, Sakai M, Shimada H, Chen J, Kaiya H, Sakano Y (2006) Development of the Japanese Version of the Social Problem Solving Inventory-Revised and examination of its reliability and validity. Kodo Ryoho Kenkyu 32(1):15–30
15. Sato H, Takahashi F, Matsuo M, Sakai M, Shimada Y, Sakano Y (2006) Factor structure of the Japanese version of the Social Problem-Solving Inventory-Revised (SPSI-R) Short Form. Paper presented at the 1st Asian cognitive behaviour therapy conference, Hong Kong
16. Nezu AM, Nezu CM, Friedman SH, Faddis S, Houts PS (1998) A problem solving approach, helping cancer patients cope. American Psychological Association, Washington
17. Chang EC, D'Zurilla TJ (1996) Relations between problem orientation and optimism, pessimism, and trait affectivity: a construct validation study. Behav Res Ther 34(2):185–194
18. Zigmond AS, Snaith RP (1983) The hospital anxiety and depression scale. Acta Psychiatr Scand 67(6):361–370
19. Kugaya A, Akechi T, Okuyama T, Okamura H, Uchitomi Y (1998) Screening for psychological distress in Japanese cancer patients. Jpn J Clin Oncol 28(5):333–338
20. Amato L, Minozzi S, Vecchi S, Davoli M (2010) Benzodiazepines for alcohol withdrawal. Cochrane Database Syst Rev 3:CD005063. doi:10.1002/14651858.CD005063.pub3
21. Nezu AM, Nezu CM, Felgoise SH, McClure KS, Houts PS (2003) Project Genesis: assessing the efficacy of problem-solving therapy for distressed adult cancer patients. J Consult Clin Psychol 71(6):1036–1048
22. Hirai K, Motooka H, Ito N, Wada N, Yoshizaki A, Shiozaki M, Momino K, Okuyama T, Akechi T (2012) Problem-solving therapy for psychological distress in Japanese early-stage breast cancer patients. Jpn J Clin Oncol 42(12):1168–1174. doi:10.1093/jjco/hys158
23. Avis NE, Levine B, Naughton MJ, Case DL, Naftalis E, Van Zee KJ (2012) Explaining age-related differences in depression following breast cancer diagnosis and treatment. Breast Cancer Res Treat 136(2):581–591. doi:10.1007/s10549-012-2277-0
24. Ziner KW, Sledge GW, Bell CJ, Johns S, Miller KD, Champion VL (2012) Predicting fear of breast cancer recurrence and self-efficacy in survivors by age at diagnosis. Oncol Nurs Forum 39(3):287–295. doi:10.1188/12.onf.287-295
25. Jadoon NA, Munir W, Shahzad MA, Choudhry ZS (2010) Assessment of depression and anxiety in adult cancer outpatients: a cross-sectional study. BMC Cancer 10:594. doi:10.1186/1471-2407-10-594