Beliefs about Cancer, Recurrence Concerns, and Health Behavior Changes in Breast Cancer Survivors[†]

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With the growing number of cancer survivors, ensuring the overall health of these individuals merits special attention; however, to date it has received limited empirical attention in Korea. The current study aimed to examine the prevalence of health behavior changes after cancer and its association with causal beliefs about cancer and recurrence concerns in 129 survivors of breast cancer in Korea. Participants were recruited from a breast cancer survivor's group in the Breast Cancer Clinic at one university hospital in Seoul, Korea. Participants completed questionnaires assessing health behaviors, concerns about recurrence, and causal beliefs regarding cancer. The behavior showing the greatest change was 'reflecting on life priorities' and 'spending quality time with family'. Stress was rated as the most important cancer cause. A few socio-demographic, clinical characteristics, and beliefs about the causes of cancer showed significant association with health behavior changes. Recurrence concerns were negatively related to increases in exercise. Current findings provide a preliminary understanding of the factors that prompt the initiation of healthy lifestyle changes among breast cancer survivors.

Keywords: Breast cancer, health behavior, stress, recurrence concern

Cancer incidence and prevalence is constantly rising, and the growing rate of breast cancer incidence is a particular concern among Korean women. According to the Korea Central Cancer Registry data of 2010, one out of three men and three out of ten women in Korea has a cumulative risk of developing cancer during their life expectancy. Breast cancer is the second most prevalent cancer in Korean women after thyroid cancer, with 14.7% of cancer in Korean women being breast cancer. On the other hand, breast cancer has relatively high survival rates and five-year survival rates in breast cancer is 89.9% (National Cancer Center & Ministry of Health and Wellfare, 2011). Given this, there is a need for particular attention and care for survivors of breast cancer. Recurrence and the occurrence of a second cancer are probable and efforts to diminish these risks are necessary. Moreover, Holland and Reznik (2005) suggested that careful attention should be given not only to the possibility of recurrence and the occurrence of a second cancer or long-term treatment sequelae, but also to the overall health status, including lifestyle issues.

Because cancer survivors overcame a life-threatening illness, one might expect that they would change their lifestyles engaging in more healthy behaviors such as healthy eating and exercising. However, previous research suggests that although many cancer survivors are engaged in healthy lifestyles after cancer, there are still many who do not change their habitual health behavior pattern (Denmark-Wahnefried, Peterson, McBride, Lipkus, & Clipp, 2000; Denmark-Wahnefried, Pinto, & Gritz, 2006; Harper et al., 2007).

Given these, it is necessary to explore factors associated with changes in the health behaviors of cancer survivors. One such factor related to the adoption of health behaviors after cancer experience can be beliefs about cancer causes. For instance, Burris and colleagues (2012) examined the relationship between recurrence reduction behavior, recurrence reduction beliefs and worry about recurrence in 200 breast cancer survivors. Their findings indicate that survivors' beliefs that their actions will reduce their recurrence risk were consistently associated with behavior while worry was largely unrelated to behavior. Also, in a study with 378 women breast cancer survivors, attributions of breast cancer cause were associated with specific health behaviors (Stewart, Duff, Wong, Melancon, & Cheung, 2001). For instance, participants who believed cancer was caused by stress were more likely to use complementary therapies and anti-depressants, and less likely to smoke (Stewart et al., 2001).

Other factors that might affect health behavior changes can be recurrence concerns, which are quite common among cancer survivors (Strewart et al., 2001; Vickberg, 2001, 2003). Holland and Reznik (2005) indicated that

cancer survivors experience a constant worry about illness and fears of disease recurrence or relapse. The report by Stewart et al. (2001) showed that over 30% of survivors worry about cancer recurrence at least weekly, even though they had survived the cancer without further treatment for at least 2 years. In addition, Vickberg (2003) suggested that fears about recurrence do not necessarily dissipate over time, with approximately 70% of breast cancer survivors being concerned about recurrence after 5 years from diagnosis. One way of managing these concerns can be the practice of healthy behaviors. For instance, in a study with colorectal cancer survivors, cancer worry was related to greater intention to change behaviors in areas of diet, exercise, weight loss, complementary therapies, and cigarette smoking (Mullens, McCaul, Erickson, & Sandgren, 2004). The extent to which a cancer survivor is concerned about the possibility of recurrence can motivate them to engage in behaviors that reduce the chances of recurrence.

With the growing number of cancer survivors, the maintenance of a disease-free and overall healthy life for these individuals merits special attention, but to date it has received relatively limited empirical attention. Pinto et al. (2002) stressed that the dearth of empirical investigation is of concern because cancer survivors who modify their health behavior will not only reduce their risk of cancer recurrence but also reduce their risk for other chronic illnesses.

Even fewer investigations regarding health behaviors have been done with breast cancer survivors in Korea. The majority of previous studies with breast cancer survivors or patients in Korea have focused on the quality of life and physical and psychosocial sequelae (e.g., Ha, 2008; Kim, Kwon, Kim, Lee, & Lee, 2008; Lee et al., 2011; Min et al., 2008).

Most studies investigating health behavior in breast cancer mainly focuses on preventative behaviors such as cancer screening, self-examination, and mammography (e.g., Choi, 2005; Lee, Kim, & Kim, 2010; Oh, Kim, & Park, 2011).

To date, little is known about cancer survivors' health behavior and factors related to the positive health behavior changes in breast cancer survivors in Korea. Survivors may vary in their readiness to make behavioral changes after a cancer experience. Understanding of the factors related to positive health behavior changes will be helpful to prevent possible cancer recurrence and to maintain their overall health. Also, few studies have investigated how breast cancer survivors view the cause of breast cancer.

Thus, in an attempt to address the gap in the current literature with Korean breast cancer survivors, the current study examined the prevalence of health behavior changes after cancer diagnosis and of the causal beliefs about cancer in Korean breast cancer survivors. The study also explored factors associated with

health behavior changes as well as the relationship between beliefs about cancer, recurrence concerns and health behaviors in Korean survivors of breast cancer, with the aim of providing an initial understanding of the factors involved in prompting health behavior change after breast cancer.

METHODS

Participants and Procedures

Participants were recruited from the breast cancer survivors' group at Seoul National University Hospital's breast cancer clinic in

Table 1. Socio-demographic and clinical characteristics of participants

Variable	No. of patients (%)
Socio-demographic characteristics	
Age (N=114)(M$\pm$SD, Range)	50.83$\pm$6.59(36-67)
Marital status (N=125)	
Married	116(92.8)
Not married (single/divorced/ widowed)	9(7.2)
Living status (N=123)	
With family/relatives	117(95.1)
Alone	9(7.2)
Education (N=120)	
Up to High school	88(73.3)
College/University	32(26.7)
Religion (N=124)	
Yes	112(90.3)
No	12(9.7)
Socioeconomic status (N=112)	
Low	15(13.4)
Middle	44(39.3)
High	53(47.3)
Medical Characteristics	
Stage of cancer (N=127)	
0/1	55(43.3)
2/3	72(56.7)
Surgery (N=110)	
Yes	110(96.5)
No	4(3.5)
Surgery type (N=110)	
Breast conserving	44(40.0)
Mastectomy	66(60.0)
Months since 1st diagnosis(N=122)(M $\pm$SD, Range)	45.26$\pm$36.93(3-181)
Recurrence/Metastasis (N=128)	
Yes	11(8.6)
No	117(91.4)
Performance Status (N=126)	
1	50(39.7)
2/3	76(60.3)

Seoul, Korea in September 2007. Inclusion criteria were as follows: being diagnosed and treated with breast cancer, being over 18 years of age, having the ability to read and understand the questionnaire, and providing informed consent. The purpose and procedure of the study was explained to participants, and those who provided informed consent were asked to complete the survey, which included questions regarding physical and psychosocial health behavior changes, beliefs about cancer causes, and concerns about cancer recurrence. Questions regarding socio-demographic and medical characteristics were also included. A total of 129 survivors participated in the survey.

Table 1 shows the socio-demographic and clinical characteristics of the 129 participants. The mean age of participants was 50.8 years (SD=6.60), and 92.8% were married. The majority of participants(73.3%) had an education up to high school. Socioeconomic status of participants was at a middle-high level (86.6%). As for medical characteristics, the majority of patients had a mastectomy (60.0%) and no recurrence/metastasis (91.4%). While 39.7% of participants were 'fully active' and able to perform activities without restriction, 60.3% of them were still restricted in physically challenging activities.

1. 'Fully active and able to carry on all predisease performance without restriction'; 2. 'Restricted in physically strenuous activity, but

ambulatory and able to carry out work of a light and sedentary nature'; 3. 'Ambulatory and capable of self-care, but unable to carry out any work activities, up and about in >50% of waking hours'

Measures

Physical and psychosocial health behaviors changes. Two physical and four psychosocial health behaviors were assessed with the items used in the study by Andrykowski and colleagues (2006; Harper et al., 2007). For physical health behavior, participants were asked whether the amount of time spent on the behavior of 'eating a healthy diet' and 'engaging in physical exercise' had 'increased', 'decreased' or had 'no change' since cancer diagnosis and treatment. The same questions were asked for psychosocial behaviors: 'reflecting on priorities in my life', 'spending quality time with friends and loved ones'; 'engaging in charitable or volunteer activities'; 'spending time in religious or spiritual activities'. Cronbach's α for two physical health behaviors was 0.63 and for four psychosocial behaviors was 0. 74 in the current study.

Beliefs about cancer causes. To examine participants' beliefs about what caused their cancer, a 21-item questionnaire consisting of 21 possible causes of cancer utilized by Wold and

colleagues (2005) was used. Each participant was asked to rate the legitimacy of each possible cause of cancer on a five-point scale (1: 'definitely does not cause cancer'-5: 'definitely causes cancer'). The questionnaire included behavioral factors such as 'smoking cigarettes', 'drinking alcohol', 'too much fat in the diet', 'lack of fruits and vegetables in the diet', 'obesity or being overweight', and 'lack of exercise'. Also, along with genetic factors like genes and family history of cancer, questions regarding environmental factors such as 'environmental pollutants', 'food additives', 'occupation or type of work', and 'power lines' were asked. Participants' causal beliefs toward medical factors like 'medical X-rays', 'infection', and 'physical injury to a cancer area', as well as 'menopause hormone replacements' and 'the use of contraceptives' were assessed. Moreover, they evaluated the degree to which they believed factors like 'stress', 'God's will', 'personality', and 'bad luck' caused their cancer.

Concerns about recurrence. Concerns about recurrence were measured by four items derived from the Concerns about Recurrence Scale (CARS) by Vickberg (2003). The items assessed the extent to which the possibility of cancer recurrence upsets respondents or how much time patients spend thinking about cancer recurrence, as well as the degree of worry or fear about cancer recurrence. The measure uses

on a 6-point response scale, with higher scores indicating higher levels of concern about recurrence. Cronbach's α for these items was 0.92 in the current study.

Performance Status. Performance status was assessed with the Eastern Cooperative Oncology Group (ECOG) scale (Oken et al., 1982), which has been widely used with cancer patients. The ECOG performance status scores range from 0 ('fully active') to 5 ('death'), with higher values indicating a poorer performance status. This measure is typically used by oncologists to rate patient functioning; however, in the current study, patients rated their own performance status, and the score of five was omitted from the scale.

Analyses

Point-biserial correlation and Chi-square analyses were performed to examine the association between health behavior changes and socio-demographic and clinical variables. To determine to what extent the beliefs of cancer cause and recurrence concerns are associated with health behaviors, point-biserial correlation analyses were conducted. To evaluate the degree to which variables are associated with health behavior increases, a binary logistic regression analyses were also performed. To maintain the statistical power of the analyses,

only study variables that were significantly correlated with each health behavior in univariate analyses were entered in the binary logistic analyses. The response categories of 'no change' and 'decrease' on the health behavior were combined into one category as only few participants had 'decreased' their health behavior. All statistical analyses were performed using the Statistical Package for the Social Sciences (SPSS), version 19 for Windows (SPSS Inc.).

RESULTS

The prevalence of health behavior increases and its associated socio-demographic and clinical factors

'Reflecting on life priorities' was the most common behavioral changes after cancer diagnosis and treatment as 86.1% of the participants reported an increase of this behavior, followed by 'spending quality time with friends and loved ones' (81.2%), 'eating a healthy diet' (77.1%), and 'engaging in physical exercise' (73.9%). On the other hand, participants reported a relatively low rate of increases in psychosocial behaviors such as 'engaging in charitable or volunteer activities(67.0%) and 'spending time in religious or spiritual activities'(50.0%).

Potential socio-demographic and medical correlates of these behaviors were also examined. For positive dietary changes, marital status ($x^2(1, N=115)=6.06$, $p<.01$) and socioeconomic status ($r_{pb}=.29**$, $p<.01$) were significantly correlated. Married individuals with higher socioeconomic status were more likely to increase healthy diet. Increases of exercise were significantly associated with higher stage of cancer ($x^2(1, N=113)=4.52$, $p<.05$). 'Reflecting on life priorities' was significantly related to younger age ($r_{pb} = -.27*$, $p<.05$), and a more advanced stage of cancer at the time of diagnosis($x^2(1, N=120)=4.86$, $p<.05$). Spending more quality time with friends and loved ones was related to age($r_{pb}=-.37**$, $p<.01$) as well as the education of participants($x^2(1, N=109)=4.14$, $p<.05$). Survivors with more than college/university level of education were more likely to increase the quality time spent with their friends and loved ones after cancer. Engaging in charity or volunteer works was significantly associated only with performance status, with the higher the level of participant's performance, the more likely they were to engage in charitable activities, $x^2(1, N=69)=8.08$, $p<.01$. Increases of the time spent on religious or spiritual activities was associated with younger age($r_{pb}=-.42**$, $p<.01$), higher performance status ($x^2(1, N=98)=4.52$, $p<.05$) and having religion($x^2(1, N=99)=6.48$, $p<.01$).

The beliefs about cancer cause in Korean breast cancer survivors: means and rankings

Mean scores of the degree of causal beliefs of cancer for each factor are presented in table 2. The top five potential causes of cancer that scored the highest in this study were stress, environmental pollutants, too much fat in diet, food additives and lack of exercises. Participants were also asked to choose one single most important causes of cancer among the 21 factors. Thirty four out of 78 responses indicated stress (43.6%), followed by too much fat in diet (6, 7.7%), and obesity or being overweight (6, 7.7%).

Associations among health behavior change, beliefs about cancer cause, and recurrence concerns

Significant results of correlational analyses between causal beliefs about cancer and health behaviors are shown in table 3. While behaviors such as diet, exercises, life priorities and quality time tends to show a similar trend of associations with more behavioral factors such as stress, lack of exercise, food additives, and

Table 2. Rank order of causes of cancer rated by participants (*N*=129).

Causes of cancer	M	SD
1. Stress	4.55	.86
2. Environmental pollutants	4.29	.80
3. Too much fat in diet	4.19	1.02
4. Food additives	4.17	.97
5. Lack of exercises	4.07	.82
6. Obesity or being overweight	4.03	.98
7. Smoking cigarettes	4.00	1.13
7. Genetic factors	4.00	1.08
9. Family history of cancer	3.99	1.13
10. Drinking alcohol	3.94	1.08
11. Power lines	3.93	.87
12. Personality	3.87	.90
13. Menopausal hormone replacement	3.68	.98
13. Lack of fruits and vegetables in diet	3.68	1.09
15. Occupation or type of work	3.66	.90
16. X-ray	3.44	.88
16. Bad luck	3.44	1.02
18. Contraceptives	3.36	.98
19. Infection	3.33	1.04
20. Physical injury to cancer area	3.13	1.06
21. God's will	2.97	1.07

obesity or being overweight, behaviors such as engaging in charity or volunteer activities and religious or spiritual activities were more related to factors that are not controllable by individuals such as God's will, family history of cancer, power lines, menopause hormone replacements, and environmental pollutants. It is also interesting that 'bad luck' was negatively related to diet and exercise, with stronger beliefs in 'bad luck', it is unlikely that individuals will increase their physical health

behaviors such as diet and exercise. It is also worthy of mention that there was a significant relationship between 'drinking alcohol' and 'engaging in charity or volunteer activities', as well as between 'contraceptives' with 'religious or spiritual activities'.

As for recurrence concerns, it was negatively associated only with 'exercise' ($r=-.25**$, $p<.01$), and its very weak correlations with other behaviors were not significant.

Table 3. The relationships between health behaviors and causal beliefs about cancer

Health behavior	Causal beliefs about cancer (r_{pb})
Diet	stress (.37*)
	environment pollution(.29**)
	bad luck(−.25*)
	lack of exercise(.22*)
	food additives(.21*)
Exercises	lack of exercise(.24*)
	bad luck(−.24**)
	obesity or being overweight (.27**)
Life priority	stress(.31**)
	obesity or being overweight(.27**)
	environmental pollutants(.26**)
Quality time	stress(.25*)
	lack of exercise (.23)
Charity or volunteer activities	God's Will(.35**)
	family history of cancer(.31*)
	menopause hormone replacements (.31*)
	food additives(.27*)
	drinking alcohol(.26*)
Religious or spiritual activities	environmental pollutants(.32**)
	contraceptives(.30*)
	menopause hormone replacements (.29**)
	power lines(28*)

* Point-biserial correlations, $p<.05$, **$p<.01$

Multivariate understanding of factors predicting health behavior changes

To evaluate the relative degree to which variables that were significant in the univariate analyses are associated with health behavior increases, binary logistic regression analyses were also performed. A summary of significant correlates of each behavior is shown in table 4.

For positive dietary changes, marital status, socioeconomic status, causal beliefs of environmental pollutants, food additives, lack of exercise, stress and bad luck were entered. Of these, only bad luck was negatively associated with diet behavior, indicating that participants who strongly attribute their cause of cancer to bad luck were less likely to make positive dietary behavior changes. These variables explained 54.7% of the variance (Nagelkerke R^2=.547), but the model fit was not good as shown by the significant Hosmer and Lemeshow tests(x^2(7, N=75)=16.618, p=.020.)

For exercise, stage of cancer, recurrence concerns, obesity or being overweight, environmental pollutants and bad luck were included in the analysis. Recurrence concerns were negatively related to increases in exercise, such that higher recurrence concerns seems to interfere with increases of exercise. These variables explained 24.9% of the variance (Nagelkerke R^2=.249). The non-significant result of the Hosmer and Lemeshow test (x^2(8, N=88)=6.452, p=.597) indicated a good model fit.

To predict 'reflecting on life priorities' after a cancer experience, age, stage of cancer at the time of diagnosis, and obesity or being overweight, environmental pollutants, and stress were entered in the analysis. Participants who see stress as a cause of cancer tend to reflect more on life priorities. These variables explained 30.4 % of the variance (Nagelkerke R^2=.304) and the non-significant result of the Hosmer and Lemeshow test (x^2(8, N=87)=6.090, p=.637) indicated a good model fit.

For the psychosocial health behavior of 'spending more quality time with friends and loved ones' following cancer, age, education, lack of exercise, and stress were entered, with only age remaining significant. The association of age with 'quality time' was a negative one. These factors explained 22.0% of the variance (Nagelkerke R^2=.220). and the non-significant result of the Hosmer and Lemeshow test (x^2(7, N=85)=3.754, p=.808) indicated a good model fit.

For the prediction of 'engaging in charity or volunteer activities', performance status, and causal beliefs of drinking alcohol, God's will, food additives, family history of cancer, and menopause hormone replacements were included. These factors explained 36.2% of the variance (Nagelkerke R^2=.362) and the non-significant result of the Hosmer and Lemeshow test (x^2(8, N=53)=4.686, p=.791) indicated a good model fit. Participants with better performance status and

stronger attribution to God's will as a cause of cancer are more likely to engage in charity or volunteer work.

Lastly, for religious or spiritual activities, age, religion, and performance status along with causal beliefs of environmental pollutants, power lines, menopause hormone replacements, and contraceptives were entered in the analysis. Participants with better performance status and stronger attribution to menopause hormone replacement as cause of cancer are more likely to engage in religious or spiritual activities . These factors explained 53.8% of the variance (Nagelkerke R^2=.538) and the non-significant result of the Hosmer and Lemeshow test (x^2(7, N=66)=2.074, p=.956) indicated a good model fit.

DISCUSSION

In this study, we examined the prevalence of physical and psychosocial health behaviors and its association with causal beliefs about cancer and recurrence concerns in survivors of breast cancer in Korea.

First of all, results suggest that the majority of participants increased healthy behaviors after their cancer experience, with the greatest increases seen in psychosocial behaviors of 'reflecting on life priorities' and 'spending more quality time with friends and loved ones' which is consistent with the previous findings. In Harper et al.'s study (2007), the behavior showing greatest change was also time spent reflecting on life priorities. Qualitative findings suggest that survivors take a new perspective in their lives (Royak-Schaler, Stanton, & Danoff-Burg, 1997) and are encouraged to pursue healthier lifestyles (Glanz, 1994). In our sample, increased rates of diet and exercises were also observed. Similarly, Min et al. (2008), in their study with 122 Korean breast cancer survivors, explored behaviors implemented by

Table 4. Summary of binary logistic regression analyses predicting of positive health behavior changes

	Predictor	B	SE	OR	95% CI*	p
Diet	Bad luck	−2.52	.91	.080	[.013, 480]	.006
Exercise	recurrence concerns	−0.11	.05	.900	[.813, .995]	.040
Life priorities	Stress	.0.83	.39	2.292	[1.058–4.966]	.035
Quality time	Age	−0.15	.07	.862	[.749, .992]	.039
Charity or volunteer activities	Performance status	1.56	.73	4.737	[1.142, 19.649]	.032
	God's Will	0.67	.33	1.953	[1.019, 3.744]	.044
Religious or spiritual activities	Age	0.27	.09	.762	[.635–.915]	.003
	Performance status	2.22	0.99	9.170	[1.317, 63.859]	.025
	Menopause Hormone replacements	1.18	0.57	3.246	[1.071, 9.840]	.037

* CI=Confidence interval for odds ratio(OR)

survivors in their efforts to prevent recurrence. Diet (90.9%) and exercise (86.8%) were the most frequent behaviors practiced by survivors. Other behaviors such as 'positive thinking' (11.5%) and 'stress management' (8.2%) were also reported. Stanton, Bower and Low (2006) suggested that individuals extract positive meaning and benefit from their experience with cancer, reporting that it prompts enhanced interpersonal relationships, deepened appreciation for life, increased personal strength, a greater spirituality, valued change in life priorities and goals, and greater attention to health-promoting behaviors. Current results suggest that a substantial portion of cancer survivors seem to change their lifestyles after cancer experiences, supporting the view of cancer experience as a 'teachable moment' or 'educational opportunity' (Denmark-Wahnefried, Pinto, & Gritz, 2006). Oncology care providers can play an important role to encourage their patients to initiate and maintain healthy behaviors during follow-up visits, and research suggests that physician recommendations enhance patients' perceptions that they can change their habits, which may account for this intervention's success (Jones, Courneya, Fairey, & Mackey, 2005).

This study also explored to what breast cancer survivors attributed the cause of their cancer. Stress was the most frequent causes of cancer endorsed by participants in this study, in accordance with previous reports. In a survey of 670 cancer survivors in the United States which included 416 survivors of breast cancer, 60.8% of breast cancer patients agreed that stress was the factor causing cancer (Wold et al., 2005). In this American study the causes most endorsed by breast cancer patients were genetic factors (genetic factors 83.4%; family history of cancer 83.7%), smoking cigarettes(80.8%), environmental pollutants (73.3%) and menopause hormone replacements (65.9%) (Wold et al., 2005). Similarly, in Stewart et al. (2001), 42.2% of women attributed the cause of their breast cancer to stress followed by genetics (26.7%), and environment (25.5%). These women also indicated a positive attitude (60.0%) and stress reduction (27.9%) as factors which prevented cancer recurrence (diet, 50.0%, healthy lifestyle, 40.3%, exercise 39.4%, prayer 26.4%). Also in a study with 115 women with breast or ovarian cancer attending a genetic clinic in France, stress along with heredity and the environment was considered to be more important than diet, smoking and alcohol (Julian-Reynier et al., 1998). Similarly, gynecologic cancer survivors believed that stress played a more important role in the development of their cancer than did these known risk factors. Stress ranked second in average ratings of importance with 46% of women rating stress as somewhat to very important in the development of their cancer. It may be that stressful life events close in

proximity to a cancer diagnosis are more salient to women than their health practices or other risk factors (Costanzo, Lutgendorf, Bradley, Rose, & Anderson, 2004). The literature suggests that despite a lack of evidence substantiating stress as a cause of cancer, many patients with cancer believed stress caused their cancer, and this can be an attempt to gain a sense of personal control over a life-threatening and often uncontrollable disease (Decruyenaere, Evers-Kiebooms, Welkenhuysen, Denayer, & Claes, 2000). In fact, among the top ten causes of cancer in the current study, they are mostly behavioral factors which are controllable by an individual, such as too much fat in diet, lack of exercise, and this finding parallels a similar result previously observed by Ferruci et al. (2011).

Also, certain causal beliefs about cancer were associated with some health behavior changes, in line with previous research (Burris, Jacobsen, Loftus, & Andrykowski, 2012; Stewart et al., 2001). Overall, diet, exercises, life priorities and quality time tends to be significantly associated more with behavioral factors such as stress, lack of exercises, obesity or being overweight, and food additives, consistent with previous findings. The findings by Rabin and Pinto (2006) with breast cancer survivors, suggested that survivors were more likely to make positive behavior changes if they felt that they were addressing a negative health behavior that

had contributed to their cancer. In fact, survivors who believed that an unhealthy diet, insufficient exercise, or alcohol consumption contributed to their cancer were more likely to modify the relevant behavior in their study (Rabin & Pinto, 2006). Additional support for this association was also found in a study by Costanzo et al. (2004) with 134 gynecologic cancer survivors. Survivors who made positive changes in their diet since diagnosis were significantly more likely to attribute cancer to stress and environmental toxins than were survivors who had not made positive dietary changes. Similarly, in the study by Stewart et al. (2001), women who took vitamins and supplements were more likely to believe in the role of diet and complementary therapies in preventing cancer recurrence. Taken together the results indicate that survivors' beliefs about causes of cancer should be considered in an attempt to promote healthy behaviors.

On the other hand, the behaviors of charity/volunteer work and religious or spiritual activities seems to be more related to factors that are beyond personal control, such as God's will, family history of cancer, and power lines, and might be related to patients' past experience such as drinking alcohol or menopause hormone replacements or contraceptives. Increases in these kinds of behaviors might be one of their ways of coping to provide a sense of meaning, purpose, hope,

and emotional comfort (Thuné-Boyle, Stygall, Keshtgar, & Newman, 2006).

Regarding the association between recurrence concerns and health behaviors, the current study only found a significant negative association with exercises, meaning that recurrence concerns seems to interfere with positive changes in exercise. This is consistent with the findings by Burris et al. (2012). In their study, while finding a significant relationship between recurrence risk reduction beliefs and behavior, worry and risk perception were largely unrelated to behavior except for tobacco use, with greater breast cancer recurrence worry being associated with less likelihood of avoiding tobacco. However, our results are contrary to other previous findings (Harper et al., 2007; Mullens et al., 2004). In Harper et al.'s study (2007), cancer-related intrusions, which are likely to be related to a fear of cancer recurrence, were positively associated with positive physical behavior changes. Nonetheless, there are inconsistent findings about the relation between emotional distress and health behavior, which necessitates further investigations. In view of a potentially negative association between recurrence concerns and positive health behavior changes, addressing recurrence concerns will be necessary and empirical studies suggest that a fear of recurrence can be effectively intervened (Mishel et al., 2005)

Results from univariate and multivariate analyses suggest that certain socio-demographic and clinical characteristics as well as beliefs regarding cancer causes seems to be significantly associated with certain healthy lifestyle changes. Age seems to be inversely related to 'quality time', with younger survivors reporting more increases in this area. It may be that the stronger impact of the diagnosis of cancer at younger age (Kroenke et al., 2004) makes those individuals realize the sudden finiteness and uncertainty of life, motivating these individuals to take a fresh look at life resulting in behaviors such as 'spending more quality time with loved ones' and 'engaging in religious or spiritual activities'. Higher socioeconomic status and education level were significantly correlated with higher likelihood of increases in a healthy diet and in time spent with friends and loved ones, in line with previous findings in Korea (Choi, 2004; Chun & Kim, 1996). Advanced stage of cancer at the time of diagnosis was associated with increases of exercise and more reflection on life priorities. Severity of the cancer seems to motivate individuals to actively engage in efforts of enhancing both physical and psychosocial wellbeing.

The perceived level of functioning was also a significant correlate of 'engaging in charity or volunteer work, and 'religious or spiritual activities', suggesting the importance of

improving both objective and subjective levels of performance status of survivors in order to enhance these psychosocial health behaviors, which can enhance overall wellbeing and adjustment of survivors. Moreover, the tendency of the attribution of cancer causes to such factors that are out of personal control like 'bad luck' needs to be addressed with appropriate educational interventions as it seems to interfere with active engagement in healthy behaviors like diet.

The current study has a few limitations that should be taken into account in the interpretation of the study findings. First of all, because our sample solely consisted of breast cancer survivors, it may not generalize across survivors of other types of cancer. Also, because the study implemented a convenience sampling procedure recruiting participants from a self-help group of survivors, we could not exclude potential sampling biases. As they are members of a patient-initiated group, they might be more active individuals than those who are not participating in these kinds of groups. Furthermore, the study's relatively small sample size might have weakened its statistical power, resulting in failure to detect otherwise significant associated factors. Moreover, as health behaviors changes were assessed only by patient self-report, we could not confirm whether participants actually made these changes. Lastly, due to the correlational nature of the study, any causal explanation about the associations among study variables cannot be drawn.

In conclusion, as more patients survive cancer and as their length of survival increases, there will be a continual need to monitor cancer survivors in an effort to ensure a disease-free and overall well-being of these individuals. This study provided preliminary evidence that certain cancer-related beliefs endorsed by survivors are associated with positive healthy behavior changes. Understanding the factors that prompt the initiation of healthy lifestyle changes among cancer survivors is a first step toward developing effective interventions for those who may need help in initiating health behaviors. Current findings also suggest that educational efforts are needed to improve the evidence-based knowledge among cancer survivors about factors associated with cancer given the possible link between causal beliefs about cancer and health behavior changes.

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유방암 생존자의 암 원인에 대한 신념, 재발 걱정 및 건강행동

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암 생존자 수가 증가하면서 암 재발 예방 및 이들의 전반적 건강 유지에 관련된 연구의 필요성이 증가되고 있으나, 한국에서는 이에 대한 경험적 연구가 부족한 실정이다. 본 연구는 암 진단과 치료 경험 이후의 건강행동의 변화와 암 원인에 대한 신념 및 재발 걱정과 건강행동간의 관계를 조사하였다. 서울 소재 대학병원 유방암 클리닉의 유방암 환우회에 소속되어 있는 129명의 유방암 생존자를 대상으로 연구변인을 평가하는 자기보고식 설문조사를 실시하였다. 건강 행동 영역에서는 '삶의 우선순위에 대한 성찰'과 '가족 및 친구와 좋은 시간을 보내는 것'에서 가장 큰 변화를 보여주었고, 참가자들은 '스트레스'를 가장 중요한 암의 원인으로 지적하였다. 연령, 사회경제적 수준, 수행 수준과 같은 일부 인구사회학적 및 의학적 변인과 더불어 암의 원인에 대한 신념이 긍정적 건강 행동 변화와 유의한 관계를 보여주었다. 재발 걱정은 '운동' 행동 증가와 부적 상관을 보여주었다. 본 연구 결과는 유방암 생존자들의 건강한 생활 방식 변화를 촉진하는 요인들에 대한 정보를 제공하며 이들의 긍정적 건강 행동 변화를 위한 다각적 접근의 필요성을 시사한다.

주요어: 유방암, 건강행동, 스트레스, 재발