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Cancer Survivors' Health Worries and Associations with Lifestyle Practices

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Abstract

This study examined among recently diagnosed breast and prostate cancer survivors (N = 678) associations between worry about a future diagnosis of heart disease or cancer and hypothetical and actual adherence to exercise and dietary guidelines. Greater worry about future illness was reported under the hypothetical scenario of non-adherence to guidelines relative to the scenario of adherence. Worry about potential heart disease was associated with actual adherence to guidelines, whereas worry about a potential cancer diagnosis was not. Findings suggest that the motivational properties of worry should be considered when developing interventions to reduce heart disease risk among cancer survivors.

Keywords

cancer; heart disease; worry; lifestyle practices

As the number of cancer survivors and their length of survival steadily increase (Bellizzi, Rowland, Jeffery, & McNeel, 2005), long-term health consequences of cancer and its treatments are becoming a public health concern. These health effects include increased risk of cancer recurrence, secondary cancers, and other chronic illnesses, such as heart disease and diabetes (Yabroff, Lawrence, Clauser, Davis, & Brown, 2004). Reasons for increased

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risk across conditions may include genetic predispositions, treatment-related sequelae, or unhealthy lifestyle practices (Doyle et al., 2006).

Unhealthy lifestyle practices, including decreased exercise and diets consisting of high levels of saturated fat and low intakes of fruits and vegetables (F&Vs), are associated with elevated risk of several cancers, heart disease, and diabetes (American Diabetic Association, 2003; Kushi et al., 2006; Pearson et al., 2002). Conversely, healthy habits may promote cancer survivors' well-being and longevity. Specifically, exercise may reduce the risk of cancer recurrence and mortality among colorectal cancer and breast cancer patients (Holmes, Chen, Feskanich, Kroenke, & Colditz, 2005; Meyerhardt, Giovannucci, et al., 2006; Meyerhardt, Heseltine, et al., 2006), and a low fat diet may reduce recurrence in postmenopausal breast cancer survivors (Chlebowski et al., 2006). Unfortunately, a significant proportion of cancer survivors do not adhere to national guidelines regarding exercise and diet (Bellizzi et al., 2005; Doyle et al., 2006).

A paucity of research has examined how cancer survivors' cognitions and emotions affect their adherence to health practices (Rabin & Pinto, 2006). Worry is one cognitive and emotional response to the threat of illness that may facilitate or inhibit health behavior. Many cancer survivors experience some degree of cancer-related worry (Ferrell, Dow, Leigh, Ly, & Gulasekaram, 1995), and, among colorectal cancer survivors, worry has been positively associated with intentions to change health behavior (Mullens, McCaul, Erickson, & Sandgren, 2004). However, little is known about the associations between worry and engagement in lifestyle practices.

In this study, we assessed cancer survivors' worry about a future diagnosis of heart disease or cancer when posed with hypothetical scenarios of adhering or not adhering to national guidelines for exercise (i.e., 150+ minutes/week of moderate-to-vigorous exercise), F&V consumption (5+ servings/day), or a low-fat diet. Under the assumption that the general public is aware of healthy lifestyle practices, we expected greater worry to be endorsed under the hypothetical scenario of non-adherence to guidelines relative to the scenario of adherence. In addition, we examined variation in worry between the two hypothetical scenarios (i.e., adherence vs. non-adherence) as a function of actual adherence to lifestyle guidelines. Based on prior research that has associated worry with health-protective action (Moser, McCaul, Peters, Nelson, & Marcus, 2007), we expected a greater difference in worry between the hypothetical scenarios among cancer survivors who actually followed the guidelines. We reasoned that cancer survivors who actually adhered to lifestyle guidelines would anticipate greater personal disease risk and associated worry under the hypothetical scenario of non-adherence to lifestyle guidelines relative to the scenario of adherence.

Methods

Participants

Data were derived from baseline surveys of 678 individuals who had been diagnosed with early-stage (in-situ, localized, or regional) breast cancer (n = 373) or prostate cancer (n = 305) within the past 9 months and who had enrolled in the FRESH START intervention trial (Demark-Wahnefried et al., 2003, 2007). This distance-medicine-based intervention was designed to increase exercise and healthy eating habits among cancer survivors. Participants were primarily Caucasian (84%) or African American (13%) and well-educated (83% with at least some college). The average age was 57.7 years (SD 10.8) and the average time since diagnosis was 3.9 months (SD 2.7). On average, participants exercised for 79.0 minutes/week (SD 140.9), derived 36.4% of their calories from fat (SD 6.6), and ate 5.6 servings of F&V/day (SD 2.9). Overall, 78%, 84%, and 48% of participants did not adhere to the national guidelines for exercise, fat intake, and F&V intake, respectively. Given that

participants were newly diagnosed survivors, side effects of recent and ongoing cancer-related treatments may have been barriers to the pursuit of lifestyle changes. Complete descriptions of the sample, measures, and procedures have been previously reported (Demark-Wahnefried et al., 2003, 2007). This study received institutional review board approval.

Measures

F&V consumption and dietary fat—Participants completed the Diet History Questionnaire (DHQ; Subar et al., 2001), which was modified to include regionally consumed foods (e.g., hominy, okra). Responses were used to classify participants as adherent (5+ servings of F&V/day and <30% of calories from fat) or non-adherent to dietary guidelines.

Exercise—Exercise was assessed using a modified version of the 7-day Physical Activity Recall (PAR; Pereira et al., 1997; Sallis et al., 1985); participants were classified as adherent if they engaged in moderate-to-vigorous exercise for 150+ minutes/week.

Worry—Participants rated their level of worry about the possibility of developing heart disease or cancer under the hypothetical scenarios of adherence or non-adherence to guidelines for each of the three lifestyle practices (i.e., F&V intake, fat intake, and exercise). Thus, a total of 12 questions assessed worry [2 (disease type) × 2 (did or did not follow guidelines) × 3 (lifestyle practices)]. For example, participants were asked, “Let’s say you regularly ate a low fat diet, how worried would you be of getting any cancer again in your lifetime?” followed by the question, “Now, if you did not regularly eat a low fat diet, how worried would you be?” Examples of a low fat diet and a description of moderate exercise were provided. Response options were: not at all worried, slightly worried, somewhat worried, very worried, and extremely worried (scored 0 to 4, respectively).

Statistical Methods

From the resulting 12 worry questions, 6 “worry difference scores” were computed by subtracting the “adherence to guidelines” question from the “non-adherence to guidelines” question within disease type and lifestyle practice. Worry difference scores, ranging from −4 to 4, indicated the magnitude of worry associated with the hypothetical conditions, with higher values suggesting greater worry under hypothetical non-adherence to guidelines relative to hypothetical adherence. T-tests were conducted to determine whether the means of the worry difference scores significantly differed from zero. Significant differences would indicate that worry scores under hypothetical non-adherence to guidelines differ from those under hypothetical adherence.

Results

Means and standard errors for worry as a function of hypothetical lifestyle practices and disease type appear in Table 1. As hypothesized, cancer survivors reported greater worry about a future diagnosis of heart disease or cancer under the hypothetical scenario of non-adherence to guidelines for exercise, F&V consumption, and fat intake than the scenario of adherence (see Table 1). This pattern was more pronounced for heart disease than cancer, as evidenced by higher worry difference scores for heart disease across all health behaviors [M 1.00 vs. M 0.57, $p < .0001$, for exercise; M 0.91 vs. M 0.75, $p < .0002$ for F&V; M 1.18 vs. M 0.88, $p < .0001$ for fat].

Next, we assessed whether worry difference scores would be positively associated with participants’ actual adherence to national lifestyle guidelines. For example, did cancer

survivors who actually adhered to exercise guidelines show a greater difference in worry about future cancer or heart disease between hypothetical scenarios (i.e., compliance or noncompliance with exercise guidelines) than survivors who did not adhere to the guidelines? When examining worry about future heart disease, greater worry difference scores were found for survivors who were non-adherent to guidelines versus survivors who did adhere to guidelines for exercise (M 1.20 vs. M 0.95, $p < .003$) and F&V consumption (M 0.98 vs. M 0.84, $p < .03$). However, worry difference scores did not vary by actual adherence to a low-fat diet. When examining worry about future cancer, worry difference scores were not significantly related to reports of actual adherence or non-adherence to guidelines for exercise (Ms 0.61 vs. 0.56), F&V consumption (Ms 0.78 vs. 0.72), or fat intake (Ms 0.98 vs. 0.85).

Discussion

Does worry about a future diagnosis of cancer or heart disease influence the lifestyle practices of cancer survivors? To address this question, we asked breast and prostate cancer survivors to anticipate their degree of worry about potential heart disease and cancer under hypothetical lifestyle scenarios, which reflected their sensitivity to the link between hypothetical health behaviors and personal worry. We then assessed whether this sensitivity was correlated with actual lifestyle practices. Cancer survivors expressed greater worry about a future diagnosis of heart disease or cancer under the hypothetical situation of non-adherence to guidelines for exercise and F&V and fat intake than the situation of adherence. These results were more pronounced for heart disease than cancer.

Findings suggest that survivors may feel more capable of preventing heart disease than cancer by engaging in healthy lifestyle practices, thus abating levels of worry. Support for this notion was obtained when worry was examined relative to actual adherence to lifestyle guidelines. Worry about potential heart disease was associated with actual adherence to guidelines for exercise and F&V consumption, whereas worry about a potential cancer diagnosis was not associated with adherence. At the time of this study, efforts had been made to educate the public about the link between exercise and reduced heart disease risk. Conversely, links between exercise and reduced cancer recurrence had not been established; studies that purport the role of exercise or a low fat diet in increasing survival had yet to be reported (Chlebowski et al., 2006; Meyerhardt, Heseltine, et al., 2006). Results may reflect general knowledge as well as cancer survivors' personal experience; for example, some participants may have developed cancer despite engagement in exercise and healthy eating.

Limitations of this study include the cross-sectional design and the use of single-item measures of worry that have not been standardized. Although the use of single-item measures reduced respondent burden, participants' diverse interpretations of worry were not assessed. People's anticipated worry and other emotional responses are often discordant with how they feel when they experience the event (Kahneman, 2000); however, research supports the notion that anticipated emotions, regardless of their accuracy, often inform decisions, including those that reduce disease risk (Bagozzi, Dholakia, & Basuroy, 2003; Chapman & Coups, 2006; Leone, Perugini, & Bagozzi, 2005; Mellers & McGraw, 2001). Future research should examine longitudinal associations between anticipated levels of worry in relation to these hypothetical scenarios and lifestyle practices of cancer survivors.

Findings suggest that motivational properties of worry should be considered when developing educational interventions to reduce the risk of heart disease among cancer survivors. However, results do not address whether interventions should frame health messages with the goal of reducing or increasing worry. Prior research on the promotion of health behavior suggests that gain-frame messages, or messages that emphasize the benefits

to be gained or costs to be avoided, are more persuasive than loss-frame messages (Rothman & Salovey, 1997). Emphasizing the enactment of health practices to reduce worry is an approach that deserves empirical examination among cancer survivors.

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Table 1

Mean Worry and Worry Difference Scores According to Hypothetical Lifestyle Practice and Disease Type

	Cancer		Heart Disease		
Hypothetical Lifestyle Practice	**M**	**SE**	**M**	**SE**	**Test of cancer vs. heart disease (p values)**
Exercise					
Adherence to guideline	1.15	.036	0.79	.030	.0001
Non-adherence to guideline	1.72	.043	1.80	.044	.16
Difference score	0.57_a	.075	1.00_a	.035	.0001
Fruit and vegetable consumption					
Adherence to guideline	1.07	.035	0.80	.029	.0001
Non-adherence to guideline	1.82	.042	1.70	.041	.052
Difference score	0.75_a	.029	0.91_a	.031	.0002
Dietary fat intake					
Adherence to guideline	1.05	.033	0.79	.029	.0001
Non-adherence to guideline	1.92	.043	1.97	.042	.48
Difference score	0.88_a	.034	1.18_a	.036	.0001

Note: Mean scores ranged from 0 to 4, with higher scores representing more worry. Mean worry difference scores ranged from −4 to 4, with scores greater than 0 indicating greater worry under hypothetical non-adherence than adherence to lifestyle guidelines. Mean difference scores with a lettered subscript were significantly different from zero ($p < .001$).