Time Since Diagnosis as a Predictor of Symptoms, Depression, Cognition, Social Concerns, Perceived Benefits, and Overall Health in Cancer Survivors

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Purpose/Objectives: To assess whether health and other factors are different in short-term cancer survivors (less than five years since diagnosis), long-term survivors (5–10 years), and very long-term survivors (more than 10 years).

Design: A cross-sectional survey.

Setting: New Zealand.

Sample: 836 survivors of adult-onset cancers (6 months to 43 years since diagnosis).

Methods: Survivors were recruited using community-based methods and answered a mailed questionnaire.

Main Research Variables: Physical and emotional health, depression, symptoms, cognitive difficulty, social concerns, and perceived benefits of cancer.

Findings: Physical and emotional health, depression, physical symptoms, and perceived benefits of cancer were not associated with time since diagnosis, but longer time since diagnosis was associated with decreases in cognitive difficulties and social concerns. The survivors in this study reported a mean of 8.4 physical symptoms, regardless of time since diagnosis, with the most frequent being fatigue (76%), aches and pain (75%), and trouble sleeping (68%).

Conclusions: Most survivors enjoyed a moderately good level of health. However, some adverse effects, such as symptoms, were similar in short-, long-, and very long-term survivors, suggesting that interventions may be needed to prevent persistent issues as time progresses.

Implications for Nursing: The findings suggest a need to reconsider the common attitude that survivors who finish treatment should be able to return to normal life. Assessment of symptoms, particularly fatigue, pain, and sleep issues, is important even in very long-term survivors.

Worldwide, 10.9 million people are diagnosed with cancer each year and 6.7 million will die from the disease (Cancer Research UK, 2008). Although the incidence of cancer is expected to rise in the next 10 years as the world population ages, advances in cancer treatments are likely to increase the number of patients with cancer who become long-term survivors. Patients are considered survivors from the day of diagnosis (National Cancer Policy Board, 2006), but stages of survivorship differ: some are undergoing cancer treatment, some are transitioning from treatment to the first years of life after cancer (short term), some are more than five years beyond their cancer diagnosis (long term), and some are more than 10 years beyond diagnosis (very long term).

Many long-term effects of adult-onset cancers and cancer treatments are poorly documented and understood, even five years after treatment (Aziz & Rowland, 2003; Fossa, Vassilopoulou-Sellin, & Dahl, 2008; National Cancer Policy Board, 2006; Pollack et al., 2005; Yabroff, Lawrence, Clauser, Davis, & Brown, 2004). Findings from cross-sectional studies (Dow, Ferrell, Leigh, Ly, & Gulasekaram, 1996; Kornblith et al., 2003) suggest that long-term survivors of breast cancer report lymphedema, numbness, sexual issues, and psychologic distress as many as 20 years after diagnosis. However, health and quality of life (QOL) are generally good. Similarly, in a study by Bush, Haberman, Donaldson, and Sullivan (1995), 125 survivors more than 10 years after bone marrow transplantation reported bothersome symptoms such as fatigue and sexual dysfunction; however, 95% of the survivors had a good QOL. Lastly, a study of 1,823 cancer survivors and age-, sex-, and education-matched comparison subjects by Yabroff et al. (2004) reported poorer health and more lost work days for cancer survivors, regardless of type of cancer, suggesting that some adverse health effects may be common in survivors rather than related to treatment or cancer type. These findings raise the possibility that interventions and guidelines could be developed that would be generally useful for survivors of all cancers. Therefore, studying cancer survivorship in all phases is important because it still is unknown whether different physical and psychologic issues may arise at different

points after completion of cancer treatment, whether different cancers have different late effects, or whether major modifiable late effects are similar across survivors of different cancers and treatments. Although prospective, longitudinal studies would be ideal for this purpose, such studies are expensive, challenging to conduct, and would take a significant period of time to complete if survival over 10 years was included (Clough-Gorr, Fink, & Silliman, 2008). Alternatively, cross-sectional studies with representative samples may provide clues about long-term effects of cancer and cancer treatment (Mosher, Redd, Rini, Burkhalter, & Duhamel, 2009).

The cross-sectional study reported in this article was a survey of 836 cancer survivors in New Zealand who were 6 months to 43 years beyond completion of cancer treatment. The purpose of the study was to describe levels of depression, physical symptoms, cognition, social concerns, and perceived benefits of cancer among short-, long-, and very long-term cancer survivors and assess the importance of years since diagnosis in predicting overall physical and emotional health, depression, physical symptoms, cognition, social concerns, and perceived benefits controlling for age, gender, and other illnesses. Unlike most previous literature on the subject, this article includes very long-term survivors in a descriptive study of the relationships between health outcomes and time since cancer diagnosis.

Methods

Participants

Eligible participants were cancer survivors aged 18 years or older when diagnosed with cancer and at least six months beyond the end of primary cancer treatment. The enrollment criteria for the study were intentionally broad to capture the effects of cancer and cancer treatment in short-term survivorship (less than five years beyond diagnosis), long-term survivorship (5–10 years beyond diagnosis), and very long-term survivorship (more than 10 years beyond diagnosis). The study was funded by Genesis Oncology Trust in New Zealand and procedures were approved by the University of Auckland institutional review board (also known as a university ethics committee) in New Zealand.

Procedures

The Life After Cancer study used data from questionnaires answered by cancer survivors who were recruited using community-based methods such as articles in local newspapers, newsletters, radio interviews, and word of mouth. New Zealand's tumor registry collects information only at the time of diagnosis, so no updated registry of long-term cancer survivors exists from which to recruit participants. Therefore, the best way to gain a representative sample was through community, media, and cancer organizations. Potential participants telephoned a research assistant who screened them for eligibility. Participants also could enroll via the study Web site, where a series of questions checked for eligibility. Eligible people received consent forms and questionnaires by mail and returned completed documents via prepaid mail. A cover letter was included that described the study and offered to conduct the questionnaire by telephone if needed. When completed questionnaires were received at the study office, a research assistant checked for missing data and phoned participants to obtain answers to omitted questions.

Measures

Life After Cancer study questionnaire: The 39-page questionnaire included a variety of concepts shown to be important to cancer survivors in prior studies. Concepts were measured by validated instruments from prior studies and questions developed specifically for the study. Each section also had space for optional qualitative data with the following open-ended question: "If there is anything else you would like to add about [the topic], please note it here." This article reports analysis of quantitative data in seven of the conceptual areas of the questionnaire.

Participant characteristics: Demographic data, such as age, gender, ethnicity, education, income, type of cancer, type of treatment, and date of diagnosis were measured by items in the questionnaire. Severity of other illnesses was measured by an 11-item Charlson Comorbidity Questionnaire (Charlson, Pompei, Ales, & MacKenzie, 1987), which accounted for severity of illness by asking about medications for illnesses and assigning points for each question based on risk of death. Cancer was not included in the items because cancer was assessed separately in this study. Summed scores (used in regression analysis) had a potential range from 0–24, with higher scores indicating more severity of other illnesses. Scores were divided into three categories of severity for the demographic table according to the method used in Charlson et al. (1987).

Depression was measured using the 11-item Iowa form of the Center for Epidemiologic Studies–Depression Scale (CES-D) and the original CES-D response of a four-point Likert-type scale for frequency in the past week (ranging from 0 [rarely or none of the time] to 3 [most or all of the time]) (Kohout, Berkman, Evans, & Cornoni-Huntley, 1993). The Iowa short form CES-D demonstrated similar reliability (Cronbach alpha = 0.76) to that of the full 20-item CES-D in 3,673 participants: factor loadings were similar to the full CES-D and regression testing showed that scores on the Iowa form can be compared to scores on the full CES-D (Kohout et al. 1993). The short and long forms of CES-D are frequently used in studies of patients with cancer (Gotay et al., 2007; Land et al., 2006; Ohira, Schmitz, Ahmed, & Yee, 2006). Total summed scores have

a range of 0–33, with higher scores indicating higher levels of depression.

The number of symptoms was measured using a checklist of 22 common symptoms related to cancer and cancer treatment that was used in previous studies of cancer survivors (Barsevick et al., 2004; Nail, Jones, Green, Schipper, & Jensen, 1991). The pattern of results obtained across multiple longitudinal studies of people undergoing cancer treatment has demonstrated the clinical validity of a checklist to measure symptoms (Barsevick et al., 2004; Clark, Nigg, Greene, Riebe, & Saunders, 2002; Nail et al., 1991; Walker, Nail, Larsen, Magill, & Schwartz, 1996). The total summed score has a range of 0–22, and higher scores indicate higher number of symptoms.

Cognitive difficulty was measured by seven items from the Functional Assessment of Cancer Therapy–Cognitive (FACT-Cog), a 50-item instrument that was developed for use in patients with cancer (Jacobs, Jacobsen, Booth-Jones, Wagner, & Anasetti, 2007; Joly et al., 2006; Tannock, Ahles, Ganz, & Van Dam, 2004). Items include difficulty forming thoughts, slow thinking, unclear thinking, trouble concentrating, trouble remembering, difficulty paying attention, and slow reactions. Each item is scored on a five-point Likert-type scale for frequency in the past week from 0 (never) to 4 (several times a day). Total summed scores have a range of 0–28, and higher scores indicate higher levels of cognitive difficulty.

The effect of cancer on social concerns was measured by the social concerns subscale of the City of Hope Quality-of-Life Instrument (cancer survivor version) (QOL-CS) (Ferrell, Dow, & Grant, 1995). The subscale consists of eight items asking about the effect of cancer on support, personal relationships, distress to family, sexuality, employment, finances, activities, and isolation. Each item is scored on a scale from 0 (worst outcome) to 10 (best outcome) for effect of cancer on social concerns at the present time. The QOL-CS social concerns subscale showed internal reliability consistency in 686 cancer survivors (Cronbach alpha = 0.81) when the instrument was developed (Ferrell et al., 1995) and 0.73 in 109 Dutch survivors of prostate cancer (van Dis, Mols, Vingerhoets, Ferrell, & van de Poll-Franse, 2006). The QOL-CS has been tested for psychometric properties in the United States, Japan, and The Netherlands (Dow et al., 1996; Fujimori et al., 2006; van Dis et al., 2006). Scoring is the mean of all items, and higher scores indicate fewer social concerns as a result of cancer.

Perceived benefits of cancer were measured by a scale developed to measure positive effects of breast cancer (Antoni et al., 2001). The 17 items use the following stem: "Having had cancer has . . ." This statement is followed by the potential benefit lines: ". . . taught me to be patient," ". . . helped me realize who my real friends are," and ". . . made me more sensitive to family issues." Responses consist of a five-point Likert-type scale ranging from 0 (not at all) to 4 (extremely). Internal consistency reliability has been demonstrated in patients with breast cancer (Cronbach alpha = 0.95) (Antoni et al., 2001; McGregor et al., 2004). Scoring is the mean of all items, and higher scores indicate more perceived benefits.

Physical and emotional health during the previous week was measured using SF-36® [v.2.0] (Ware et al., 2007). The physical component summary (PCS) includes scales of physical functioning, physical role, pain, and general health. The mental component summary (MCS) includes scales of vitality, social function, emotional role, and mental health. Good internal consistency reliability (Cronbach alpha > 0.8) has been reported for all of the SF-36 scales and for the PCS and MCS in a variety of populations, including cancer survivors (Bennett, Lyons, Winters-Stone, Nail, & Scherer, 2007; Hopko et al., 2008; Onishi et al., 2007; Ware et al., 2007). Scores range from 0–100, with higher scores indicating better physical or emotional health.

Analysis

To describe the mean scores among survival groups on outcomes without consideration of covariates, analysis of variance (ANOVA) was used to provide a snapshot of the variables in the three survivor groups: short term, long term, and very long term. To account for the covariates of age, gender, and severity of illness, multiple regression models were used to show the effect of years since cancer diagnosis on overall physical health, overall emotional health, depression, physical symptoms, cognitive difficulty, social concerns, and perceived benefits. SPSS® [v.15.0] was used for all analyses.

Results

Recruitment began in April 2007 and data collection ended in January 2008. Of 942 potential participants who contacted the study, 17 did not meet inclusion criteria. Of 925 participants who enrolled, 836 (90%) returned completed surveys. The average time to complete the questionnaire was about two hours (range = 20 minutes to 14 hours). Among the 89 participants who did not complete surveys, 67 were lost to follow-up, 20 withdrew voluntarily or died, and two returned surveys after the study closed. Participants were considered lost to follow-up after being reminded three times by telephone to complete surveys.

The characteristics of 836 participants who completed questionnaires are shown in Table 1. Participants were primarily Caucasian and women with a mean age of 61.8 years and a mean of 9.9 years since the end of cancer treatment. They lived in urban and rural towns throughout New Zealand. The most common cancer reported was breast cancer.

Table 1. Characteristics of Participants Across Survival Groups

Characteristic	Years Since Diagnosis: Less Than 5 (N = 303) $\bar{X}$	SD	5–10 (N = 238) $\bar{X}$	SD	More Than 10 (N = 295) $\bar{X}$	SD	p
Age (years)[a]	58.6	12.3	60.8	11	65.9	11.8	< 0.001
Years since diagnosis[b]	2.6	1.2	7.2	1.4	19.6	8	–
Characteristic	**n**	**%**	**n**	**%**	**n**	**%**	**p**
Gender							0.15
Female	206	68	178	75	217	74	
Male	97	32	60	25	78	26	
Race or ethnicity[c]							0.2
White	276	91	222	93	285	97	
Maori	17	6	11	5	7	2	
Other	9	3	4	2	3	1	
Education							0.66
High school or less	103	34	90	38	121	41	
University	150	50	110	46	131	44	
Postgraduate degree	50	17	38	16	43	15	
Household income (U.S. $)[c]							0.01
30,999 or less	112	38	100	43	150	53	
31,000–61,999	115	39	77	33	75	27	
62,000–77,999	29	10	18	8	23	8	
More than 78,000	39	13	37	16	33	12	
Severity of other illnesses[c,d]							0.23
Not ill to mildly ill	284	94	228	96	268	91	
Moderately ill	12	4	9	4	18	6	
Severely ill	6	2	1	<1	6	2	
Type of cancer							< 0.001
Breast	138	45	108	45	111	38	
Colorectal	36	12	38	16	61	21	
Leukemia or lymphoma	31	10	18	8	25	8	
Prostate	25	8	19	8	5	2	
Other	73	24	55	23	93	32	
Type of cancer treatment[c]							< 0.001
Surgery only	44	16	51	23	85	31	
Surgery followed by chemotherapy or radiotherapy	109	40	92	42	75	27	
Chemotherapy or radiotherapy followed by surgery	6	2	4	2	9	3	
Chemotherapy or radiotherapy only	27	10	18	8	22	8	
Other or not sure[e]	89	32	54	25	84	30	

N = 836

[a] Range = 23–90 years

[b] Range = less than 1–43 years

[c] Not all participants answered questions in this category.

[d] Weighted score based on Charlson et al. (1987)

[e] Includes hormonal therapies in combination with other treatments

Note. Because of rounding, not all percentages total 100.

Note. Chi-square test or analysis of variance was used to determine differences among groups.

The largest community-based sources of potential participants were two articles in newsletters sent to customers of the energy company that underwrites the foundation that funded the study, which resulted in 356 potential participants. Other sources included 222 potential participants from articles in community [non-cancer] newsletters, TV advertisements, and radio interviews; 151 from articles in newspapers (free and paid subscription); 117 from word of mouth; 84 from cancer-related newsletters; and 12 from study brochures and the Web site.

Description of Outcomes Among Survival Groups

Mean levels of physical health, emotional health, depression, physical symptoms, cognitive difficulty, social concerns, and perceived benefits among short- and long-term survivors are shown in Table 2. Cognitive difficulties were lower and social concerns were fewer in long-term survivor groups, but depression, number of symptoms, and perceived benefits of cancer were similar for all groups. The three most frequently named symptoms were fatigue (76%), aches and pain (75%), and trouble sleeping (68%). The proportion of participants reporting these symptoms were similar in all groups.

Years Since Diagnosis as a Predictor of Outcomes

Multiple regression analyses were conducted to evaluate the association between years since diagnosis and physical health, emotional health, depression, physical symptoms, cognitive difficulty, social concerns, and perceived benefits, controlling for age, gender, and severity of other illnesses. Type of cancer and type of cancer treatment were not included in the models because they were not associated with physical or emotional health in a univariate ANOVA model. As shown in Table 3, the linear combination of predictor variables explained between 4%–13% of the variance in seven outcome variables. The associations between length of survivorship (measured by years since diagnosis) and physical health, emotional health, depression, physical symptoms, and perceived benefits

were not statistically significant; therefore, these factors were similar in study participants regardless of length of survivorship, age, gender, and other illnesses. However, as years since diagnosis increased, social concerns and cognitive difficulties decreased significantly. The unexplained variance in physical and emotional health may be explained by health factors, such as those the authors measured in this study (e.g., depression, symptoms, social concerns). However, the authors did not include these health factors as predictors in the models because of potential conceptual overlap with the SF-36 subscales.

Table 2. Mean Scores of Measured Factors and Most Frequent Symptoms Among Survivor Groups

	Years Since Cancer Diagnosis						
	Less Than 5 (N = 303)		5–10 (N = 236)		More Than 10 (N = 297)		
Measured Factor	**$\bar{X}$**	**SD**	**$\bar{X}$**	**SD**	**$\bar{X}$**	**SD**	**F**
Benefits of cancer	2.2	0.9	2.3	1	2.3	1	0.48
Cognitive difficulty	7.6	7.6	6.6	7	5.9	7	4.51*
Depression	5.6	5.1	5.3	4.7	5.6	5.1	0.24
Emotional health	72.6	15.4	73.5	15	73	16.2	0.19
Number of symptoms	8.1	4.2	8.6	4.1	8.2	4.2	1.14
Physical health	69.6	17.9	70.1	16.1	68.2	19.2	0.78
Social concerns	6.1	1.9	6.8	1.9	7	2	14.27**
Measured Factor	**n**	**%**	**n**	**%**	**n**	**%**	**F**
Aches or pains	220	73	187	79	218	74	0.06
Fatigue	231	76	187	79	217	73	1.37
Trouble sleeping	209	69	160	68	195	66	0.37

* $p < 0.05$; ** $p < 0.001$

Discussion

The authors' finding that increasing years since diagnosis was not associated with reduced physical and emotional health suggests that overall health may not be different in people with different lengths of survivorship. Although New Zealand's population norms are not available for the SF-36, the mean scores of participants were above the 75th percentile in U.S. population norms (Ware et al., 2007), suggesting general good health compared to people without cancer. This finding of relative good health is similar to the good health, low psychological distress, and good QOL reported in a cross-sectional study of 125 survivors of bone marrow transplantation (Bush et al., 1995) and the good health, in spite of symptoms such as lymphedema and numbness, reported in a cross-sectional study of 153 survivors of breast cancer 20 years after treatment (Kornblith et al., 2003). This study contributes substantial data on the general good health of long-term survivors; however, studies concerning this population are too few to provide conclusive evidence, particularly because one study of long-term survivors showed different results. A cross-sectional epidemiologic study in the United States found that 493 survivors more than 11 years from diagnosis had poorer health and more symptoms compared to age-matched people who had never had cancer (Yabroff et al., 2004), an important finding because health of survivors was compared to people without cancer in that study. The current study is one of very few investigations that have included cancer survivors more than 10 years beyond diagnosis.

Clearly, much remains to be learned about the effect of cancer on future physical and emotional health. The relatively small explained variance in this study's regression models shows the importance of factors not measured and suggests the complexity of factors that affect health in cancer survivors. Even so, the relationship of years since diagnosis with other outcomes reveals differences that may be important to the survivors' QOL. The measures of depression, physical symptoms, cognitive difficulty, and social concerns in this study provided a more in-depth measure of these concepts than the shorter subscales of the SF-36 used as measures of overall physical and emotional health. In this sample of survivors, from 6 months to 43 years since diagnosis, number of years since diagnosis was not associated with depression, level of physical symptoms, or perceived benefits of cancer when age, gender, and other illnesses were controlled. Although the data were cross-sectional, these findings are important because they suggest that these factors, which also affect overall health, are similar in survivors regardless of time since diagnosis and end of cancer treatment.

Depression and physical symptoms are common during cancer treatment and in the early survivorship experience (Hopko et al., 2008; Kornblith et al., 2007; Land et al., 2006; Nail, 2001; Syrjala et al., 2004; Visser & Smets, 1998), but less is known about whether depression and symptoms are frequent in the years following cancer treatment. Patients with cancer often are told that symptoms related to cancer treatment are likely to decrease or disappear when treatment is complete. In contrast, the findings from this study suggest otherwise; depression and symptoms are present in short- and long-term survivors. Depression was quite modest in study participants, even in short-term survivors. The mean number of more than eight symptoms was consistent across survival groups. The finding that fatigue, aches and pain, and trouble sleeping were

reported by short- and long-term survivors equally frequently indicates that attention to these symptoms is important for all survivors. These three particular symptoms also were mentioned most frequently in a cross-sectional study by Dow et al. (1996) of 294 survivors of breast cancer who were 4 months to 28 years after diagnosis (the study did not report separate results for short- and long-term survivors).

The finding that perceived benefits of cancer were moderate in all survivor groups and unrelated to number of years since diagnosis warrants additional research. Prior studies have reported that benefit finding is an important but often unmeasured conceptual contributor to QOL in cancer survivors (Dow et al., 1996; Fromm, Andrykowski, & Hunt, 1996), although others have shown that benefit finding may be related to stage of cancer and may, in fact, lead to decreased mental well-being six months after diagnosis, possibly from high expectations going unrealized (Tomich & Helgeson, 2004).

Social concerns and cognitive difficulties were significantly related to years since diagnosis, indicating that social concerns and cognitive difficulties were fewer in those who had survived longer. Social concerns have seldom been studied as related to health in cancer survivors, particularly long-term survivors, although this could be an important factor in QOL, particularly in survivors of cancers that affect physical appearance or bodily functions, such as incontinence. Cognitive difficulty is reported by many patients undergoing cancer treatment and some continue to report issues after conclusion of treatment. Cognitive changes often are subtle and survivors may think they are caused by age rather than cancer treatment (Tannock et al., 2004). Research into cognitive impairment associated with chemotherapy is fraught with methodologic and measurement issues, such as lack of consistency in defining cognitive impairment, use of neuropsychologic and self-report measures, and lack of control group comparisons (Vardy, Rourke, & Tannock, 2007). The current study has many of the limitations cited in earlier studies, but the lower self-reported cognitive difficulties in very long-term survivors is intriguing and indicates a need for research that differentiates perception of cognitive difficulties at different points in the survivorship continuum.

Like most prior studies, the current study was cross-sectional and causal implications cannot be identified. However, the findings may point the way to significant areas for future inquiry into the duration of effects from cancer and cancer treatments. The strength of this study was its large sample size that included survivors within a year of cancer diagnosis up to those many years beyond diagnosis. The 90% return of completed questionnaires shows the enthusiasm of cancer survivors to share their issues. The community recruitment of volunteers for this study was necessary because New Zealand keeps data on original tumor diagnoses but does not maintain a database of survivors from which the authors could have recruited participants. Although some would argue that a volunteer sample is subject to bias, a similar bias likely would be present in a sample recruited from a cancer registry because participants also volunteer when contacted through a registry. However, the authors acknowledge that a volunteer sample may primarily include survivors who have health issues they wish to report or, conversely, that participants may have been exceptionally well and eager to report. In a volunteer sample such as the one in this study, the direction of bias is unknown. Therefore, the findings of differences or similarities between short-, long-, and very long-term survivors must be viewed with caution because the sample may not represent all cancer survivors. The high proportion of breast cancer survivors in the sample is not unusual because breast cancer advocacy groups have created a culture of participation in cancer-related activities and research. As a result, more studies exist with survivors of breast cancer than other cancers, and prior studies of all cancer types are similar to the current one when it comes to enrolling high numbers

Table 3. Years Since Diagnosis as a Predictor of Health and Other Factors in Multiple Regression Models

	Predictor Variables							
	Years Since Cancer Diagnosis		Age		Gender		Other Illnesses	
Outcome Variable	β	p	β	p	β	p	β	p
Cognitive difficulty (R^2 = 0.1*)	–0.09	0.01	–0.19	< 0.001	0.08	0.01	0.22	< 0.001
Depression (R^2 = 0.06*)	0.01	0.8	–0.09	0.02	0.11	< 0.01	0.22	< 0.001
Emotional health (R^2 = 0.11*)	–0.02	0.6	0.14	< 0.001	–0.08	0.02	–0.3	< 0.001
Perceived benefits (R^2 = 0.04*)	0.03	0.37	–0.12	< 0.01	0.13	< 0.001	0.1	< 0.01
Physical health (R^2 = 0.13*)	–0.03	0.36	< 0.01	0.93	–0.08	0.01	–0.35	< 0.001
Physical symptoms (R^2 = 0.1*)	–0.04	0.22	–	0.97	0.15	< 0.001	0.29	< 0.001
Social concerns (R^2 = 0.1*)	0.16	< 0.001	0.19	< 0.001	0.05	0.11	–0.18	< 0.001

* $p < 0.001$ (p value of F statistic)

Note. β is the standardized regression coefficient.

of breast cancer survivors. For example, a review of published studies of cognition in cancer survivors reported that 82% of the studies were of survivors of breast cancer (Vardy et al., 2007).

Conclusion

This study is one of the few to report on issues important to the physical and emotional health of long-term and very long-term cancer survivors. Cancer survivors are likely to enjoy a moderate level of health regardless of years since diagnosis, age, gender, or other illnesses. However, nurses should be aware that potentially adverse effects of cancer and cancer treatment, such as physical symptoms and depression, do not change with each year since cancer diagnosis, indicating that interventions may be needed early in the survivorship experience to prevent persistent issues as years progress. Although a longitudinal study of the effects of cancer treatment still is warranted, this large cross-sectional study suggests a need for nurses to reconsider the common attitude that survivors who are not likely to relapse should be able to return to "normal" life. A return to health and normal life are laudable goals; however, achievement may require attention to adverse effects of cancer and cancer treatment that persist for many years.

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