

## Predicting Fear of Breast Cancer Recurrence and Self-Efficacy in Survivors by Age at Diagnosis

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**T**he American Cancer Society ([ACS], 2012) estimated that more than 2.6 million women in the United States are breast cancer survivors. With increasing early detection and more effective treatment, breast cancer survival rates continue to rise, making psychosocial consequences of breast cancer, such as fear of recurrence, a concern for many women (Ferrell, Grant, Funk, Otis-Green, & Garcia, 1998a; Northouse, 1981; Vickberg, 2001; Welch-McCaffrey, Hoffman, Leigh, Loesch, & Meyskens, 1989). For most breast cancer survivors, fear of recurrence is a life-long concern (Vickberg, 2001). The prevalence of fear of recurrence suggests that survivors and oncology professionals need research to describe the construct and its prevalence and then test interventions to help survivors manage this problem.

Several factors may be relevant to the study of fear of recurrence. For instance, past work has identified age at diagnosis as an important factor in psychological symptoms of breast cancer survivors (Hewitt, Greenfield, & Stovall, 2006). Other variables such as anxiety, knowledge of symptoms, and breast cancer reminders also have been identified (Vickberg, 2001). In addition, self-efficacy demonstrates promise as a construct related to a woman's ability to handle survivorship problems (Bandura, 1997). Self-efficacy specific to breast cancer survivorship is defined as perceived confidence in managing symptoms and concerns related to diagnosis and treatment of breast cancer. Survivorship literature identifies self-efficacy as a mediator of symptom distress (Cunningham, Lockwood, & Cunningham, 1991; Lev, Paul, & Owen, 1999). The purpose of this research was to determine the effect that age at diagnosis has on fear of recurrence and identify the predictors of fear of recurrence using self-efficacy as a mediator.

**Purpose/Objectives:** To determine the effect that age at diagnosis has on fear of breast cancer recurrence and to identify the predictors of fear of recurrence using self-efficacy as a mediator.

**Design:** Cross-sectional survey.

**Setting:** Two university cancer centers and one cooperative group in the midwestern United States.

**Sample:** 1,128 long-term survivors.

**Methods:** Survivors were eligible if they were aged 18–45 years (younger group) or 55–70 years (older group) at cancer diagnosis, had received chemotherapy, and were three to eight years postdiagnosis. Fear of recurrence was compared between younger and older groups. Multiple regression analyses were used to test variables' prediction of fear of recurrence and breast cancer survivor self-efficacy, as well as breast cancer survivor self-efficacy mediation effects.

**Main Research Variables:** Fear of recurrence, breast cancer survivor self-efficacy, and age at diagnosis.

**Findings:** Survivors diagnosed at a younger age had significantly higher fear of recurrence, as well as health, role, womanhood, death, and parenting worries. Perceived risk of recurrence, trait anxiety, and breast cancer reminders explained significant variance in fear of recurrence and breast cancer survivor self-efficacy. Breast cancer survivor self-efficacy partially mediated the effects of variables on fear of recurrence.

**Conclusions:** The findings suggest that breast cancer survivor self-efficacy may have a protective effect for survivors who are younger at diagnosis and have higher perceived risk of recurrence, higher trait anxiety, and more breast cancer reminders. Oncology nurses already use the skills required to support self-efficacy. Additional research is needed to define and test breast cancer survivor self-efficacy interventions.

**Implications for Nursing:** Oncology nurses are in a key role to assess fear of recurrence and provide self-efficacy interventions to reduce it in breast cancer survivors. Strategies to efficiently address fear of recurrence to reduce psychological distress in survivorship follow-up care are warranted.

## Background

Fear of recurrence is a distressing problem for the majority of survivors (Bloom, Stewart, Chang, & Banks, 2004; de Haes, Curran, Aaronson, & Fentiman, 2003; Ferrell et al., 1998a; Härtl et al., 2003; Mast, 1998; Northouse, 1981; Welch-McCaffrey et al., 1989). It interferes with quality of life, enjoyment of life, and global sense of well-being (Cimprich, Ronis, & Martinez-Ramos, 2002; Spencer et al., 1999). In addition, a higher fear of recurrence is correlated with syndromes such as post-traumatic stress disorder in long-term survivors (Mehnert, Berg, Henrich, & Herschbach, 2009; Vickberg, 2003). In one study, fear of recurrence was significantly greater than any other concern, including those related to long-term effects of chemotherapy (Spencer et al., 1999).

Historically, fear of recurrence research has focused only on fear of the cancer returning (Ferrell, Dow, Leigh, Ly, & Gulasekaram, 1995; Härtl et al., 2003; Hilton, 1989; Kornblith et al., 2007; Mast, 1998; Northouse, 1981; Spencer et al., 1999). That approach is limited in that survivors' perceptions about fear of recurrence rarely are unidimensional. For instance, Vickberg (2001) found that one component of fear of recurrence for many women concerned fear about returning to chemotherapy. Some qualitative research has identified additional components of fear of recurrence. For example, survivors report fear of recurrence because they have young children and worry that a recurrence will not allow them to parent as their children grow (Ferrell et al., 1996). As Vickberg (2001, 2003) explored global fear of recurrence and ongoing worries, she found that survivors had concerns about health, womanhood, work, and relationship roles, as well as death. The same view was reported by other researchers (van den Beuken-van Everdingen et al., 2008). Viewing fear of recurrence as a multidimensional construct will allow clinicians and researchers to tailor fear of recurrence interventions.

## Antecedents

Age at diagnosis has been identified as an important covariate for fear of recurrence. Kornblith et al. (2007) found that survivors diagnosed at age 55 or younger had a higher fear of recurrence than those diagnosed at age 65 and older, whereas Cimprich et al. (2002) did not find differences in fear of recurrence in those diagnosed when younger than 45, aged 45–65, and older than 65 years. Both studies had fairly small sample sizes. In addition to age at diagnosis, initial treatment may impact fear of recurrence, including type of surgery, use of radiation, and use of tamoxifen or aromatase inhibitors (Vickberg, 2001). Therefore, the current study was designed with distinct age groups and initial treatment was controlled by including those with chemotherapy.

Time since diagnosis is another potential variable related to fear of recurrence. Some studies only assessed survivors one year or less post-treatment (Spencer et al., 1999), whereas others assessed survivors ranging from a few months to a few years post-treatment (Cimprich et al., 2002; Clayton, Mishel, & Belyea, 2006; Connell, Patterson, & Newman, 2006; Härtl et al., 2003; Hilton, 1989; Mast, 1998; Spencer et al., 1999; Vickberg, 2003). Literature describing the relationship between time since diagnosis and fear of recurrence has been hampered by lack of variability in time since diagnosis, an issue that the current study addressed. Women eligible for this study were three to eight years from initial treatment. Therefore, the authors could address the relationship between time since diagnosis and fear of recurrence. Because a commonly accepted survivorship marker is five years postdiagnosis, the authors decided to include a range before and after this marker (e.g., three to eight years) to control for any differences in perception related to length of time since diagnosis.

Several variables that might act as predictors of fear of recurrence were identified in the literature and clinical practice. In this section, the authors will describe those additional variables, including perceived risk of recurrence, knowledge of someone with a recurrence, symptom bother, recurrence signs, trait anxiety, and breast cancer reminders.

Perceived risk of developing cancer has been studied in the context of cancer worry in populations at high risk for cancer (Easterling & Leventhal, 1989; Loescher, 2003). Individuals who had a higher perceived risk of developing cancer reported greater cancer worry and reported more cancer worry in the presence of increased symptoms (Easterling & Leventhal, 1989). In qualitative research, women described knowing someone with a recurrence (including public figures) as a trigger for their own fear of recurrence (Vickberg, 2001).

Little is known about the knowledge survivors have regarding symptoms of recurrence. The presence of breast cancer-related symptoms and non-breast cancer-related symptoms have been found to be associated with thoughts about recurrence (Clayton et al., 2006). Many survivors experience ambiguous symptoms, such as fatigue, and misinterpret these as signs that their cancer has recurred (Lee-Jones, Humphris, Dixon, & Hatcher, 1997). That may lead to behavioral responses such as repeated body checking, persistent requests for tests, and seeking repeated reassurance from healthcare providers during survivorship (Fredette, 1995; Lee-Jones et al., 1997), as well as the tendency to obsess over symptoms (Figueiredo, Fries, & Ingram, 2004; Welch-McCaffrey et al., 1989).

Although trait anxiety has not been found to increase a woman's risk of developing breast cancer (Aro et al., 2005), it has been associated with emotional and physical

distress (Ferrell et al., 1998a; Hewitt, Herdman, & Simone, 2004). In women with early-stage breast cancer, trait anxiety has been associated with persistent distress for at least two years postdiagnosis (Bleiker, Pouwer, van der Ploeg, Leer, & Adér, 2000). Knowledge of the role of trait anxiety in fear of recurrence could help healthcare providers as they plan, support, and guide anxiety-reduction interventions.

Long-term survivors report the highest levels of fear of recurrence during healthcare-related visits, such as mammography appointments and visits to the healthcare team. Those routine follow-up appointments may coincide with their anniversary date of diagnosis, the most intense reminder of breast cancer (Spencer et al., 1999; Vickberg, 2003). Breast cancer survivor self-efficacy has been demonstrated to be significantly lower in women diagnosed at age 45 years and younger compared to women diagnosed at 55 years or older (Champion, Sledge, Ziner, Monahan, & Zho, 2010).

## Self-Efficacy

Theories of emotion and self-efficacy are the basis of the theoretical framework that guides this study. Emotion theorists posit fear is an emotional response to stimuli perceived as harmful (Lazarus, 1991; Ohman, 2000). Self-efficacy is the confidence to produce desired effects by one's own actions (Bandura, 1997). In this study, self-efficacy is defined as one's confidence in the ability to manage symptoms and emotions related to having breast cancer, including the ability to ask for help, know how and when to report symptoms, and do what is important after breast cancer treatments are completed. Building on the identified antecedent variables and breast cancer survivor self-efficacy, two research questions were proposed: (a) Does fear of recurrence and related subscales differ between survivors diagnosed at younger and older ages, and (b) does breast cancer survivor self-efficacy mediate the relationship between antecedent variables and fear of recurrence?

## Methods

### Design and Sample

This study used a cross-sectional survey design to collect data within a larger breast cancer survivor quality-of-life study. The larger study was designed with a distinct age gap, leaving out women diagnosed from ages 46–54 years, to test differences between women diagnosed with breast cancer at a young age (45 or younger) and women diagnosed at an older age (55–70); this gap was to allow potentially smaller differences to be detected. A theoretical framework proposing relationships among fear of recurrence, as well as research-identified variables, guided data collection

and analysis. Surveys were mailed to participants' homes after they provided written informed consent.

A total of 1,128 survivors were included in the study. Survivors were eligible if they had been diagnosed from age 18–45 years for the younger group or age 55–70 years for the older group. Eligibility included chemotherapy as part of their treatment and being three to eight years from initial diagnosis. A total of

**Table 1. Demographic Characteristics**

Characteristic	n	%
<b>Age at diagnosis (years)</b>		
45 or younger	505	45
55–70	623	55
<b>Race</b>		
Caucasian	1,042	92
African American	43	4
American Indian	10	1
Other or mixed race	33	3
<b>Income (\$)</b>		
Less than 15,000	56	5
15,001–30,000	138	12
30,001–50,000	210	19
50,001–75,000	248	22
75,001–100,000	194	18
100,001–150,000	131	12
150,001–200,000	64	6
More than 200,000	49	4
Don't know	20	1
Unreported	18	2
<b>Marital status</b>		
Married	837	74
Divorced	80	7
Widowed	104	9
Single	89	8
Unreported	18	2
<b>Highest education</b>		
Graduate or professional degree	211	19
Some graduate school	56	5
Four years of college	157	14
Two years of college	89	8
Some college	192	17
Technical or trade school	103	9
High school	269	24
Some high school	32	3
Elementary school	2	< 1
Unreported	17	2
<b>Type of surgery</b>		
Mastectomy	574	51
Lumpectomy	532	47
Both	19	2
Unreported	3	< 1
<b>Time since diagnosis (years)</b>		
3	47	4
4	164	15
5	252	22
6	240	21
7	234	21
8	160	14
9	31	3

N = 1,128

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



744 younger and 937 older eligible survivors were contacted and 505 (68%) younger and 623 (67%) older survivors agreed to participate (see Table 1).

## Data Collection

Women were recruited from three settings: two Midwestern university cancer centers and one cooperative oncology group. Recruitment proceeded according to Health Insurance Portability and Accountability Act of 1996 guidelines after Indiana University-Purdue University Indianapolis institutional review board approval. Current healthcare providers asked eligible survivors if they were willing to be approached by the study staff. If survivors agreed, healthcare providers sent survivors' contact information to the study staff, who then contacted interested survivors by phone or in person. Written informed consent was obtained.

## Instruments

Several instruments were used to measure variables hypothesized to affect fear of recurrence. All instruments were tested for content validity by five quality-of-life researchers and three clinical breast cancer experts, with both groups assessing the item-Content Validity Index ([item-CVI] as 1, resulting in an excellent modified kappa statistic [ $k^*$ ] of 1). Twelve survivors confirmed face validity.

Demographic variables, including age at diagnosis, were measured by questions asked as part of the cross-sectional survey. Perceived risk of recurrence was measured by one item: "I will have a breast cancer recurrence at some time in my life," with a five-point Likert-type response scale ranging from 1 (strongly disagree) to 5 (strongly agree). The single item is similar to one previously used to assess perceived risk of developing cancer for those at high risk (Loescher, 2003).

Knowledge of someone with a recurrence included a single dichotomous item asking whether the survivor knew anyone with a breast cancer recurrence. Qualitative research has identified this as a key component of fear of recurrence. The single item was developed for the current study from qualitative literature identifying this concept (Vickberg, 2001).

**Knowledge of Recurrence Signs** is a scale that was developed based on the American Society of Clinical Oncology's (2001) common clinical symptoms of recurrence. It includes 11 items: six common clinical symptoms of recurrence and five symptoms not associated with recurrence. The six common clinical symptoms of recurrence were (a) bone pain or tenderness lasting more than two weeks; (b) skin rashes, redness, or swelling on breast(s), scar, or chest area; (c) new lumps or other changes in breast(s); (d) chest pain and shortness of breath; (e) persistent abdominal fullness, discomfort, or pain; and (f) changes in weight, particularly weight loss. The five

symptoms not associated with recurrence were fever, frequent colds, flu-like symptoms, persistent hot flashes, and changes in sleep patterns. Participants were asked to indicate whether the item was a sign of breast cancer recurrence (i.e., true or false). Correct responses were summed for a total score, with a higher score indicating greater knowledge. Internal consistency reliability (Kuder-Richardson formula 20) was 0.77.

**Ridner's Symptom Bother Scale** has items to measure the presence and bother of common symptoms associated with arm and chest wall sensations on the mastectomy or lumpectomy side, which were extracted from the Lymphedema Symptom Intensity and Distress Scale-Arm (LSID-A) (Ridner & Dietrich, 2010). A modified version of 12 symptoms, including arm feels heavy, hand swollen, arm swollen, chest swollen, arm feels tight, arm feels hard, numbness, breast pains, skin crawls, change sleeping position because of symptom, and related bother, was used for this study (Cronbach alpha = 0.88). The weighted global index of symptom burden in two studies using the full LSID-A scale had a Cronbach alpha of 0.95 (Ridner & Dietrich, 2010).

The **Trait Anxiety Inventory**, a 20-item trait subscale, measures how anxious people feel in general (Spielberger, Gorsuch, Lushene, Vagg, & Jacobs, 1983). Median test-retest correlations for the trait anxiety inventory ranged from 0.7–0.77. Concurrent validity with other measures of trait anxiety were high, ranging from 0.73–0.85 (Spielberger et al., 1983). In a pretest, post-test design study of 123 breast cancer survivors, the alpha was reported as 0.92 pretest and 0.94 post-test (Fogarty, Curbow, Wingard, McDonnell, & Somerfield, 1999). In the current sample, Cronbach alpha reliability was 0.93.

Eight items based on survivor accounts of triggers of fear of recurrence (Ferrell et al., 1996; Vickberg, 2001) were provided, including (a) breast cancer fundraising events, (b) helping other women with breast cancer through support groups or individuals calls, (c) my annual date of diagnosis, (d) my mammogram, (e) new symptoms I do not understand, (f) hearing of someone I know who has had a recurrence, (g) routine oncologist appointment, and (h) having blood drawn for tests or IV. An additional choice, "other," allowed survivors to self-identify triggers not on the list. Survivors identified the amount of time in the last month that the reminders caused them to think about breast cancer. The nine-item, Likert-type scale ranged from 1 (not at all) to 5 (all or most of the time), with 0 = not applicable. Responses were summed. For construct validity, Pearson  $r$  correlations were used. The Breast Cancer Reminders scale was significantly correlated with the Impact of Events Scale-Revised (IES-r) ( $r = 0.41$ ,  $p < 0.001$ ); all IES-r subscales, including avoidance ( $r = 0.28$ ,  $p < 0.001$ ), intrusion ( $r = 0.43$ ,  $p < 0.001$ ), and hyperarousal ( $r = 0.35$ ,  $p < 0.001$ ); and the fear of recurrence

index of the Concerns About Recurrence Scale (CARS) ( $r = 0.39$ ,  $p < 0.001$ ) (Ziner, 2008).

The **Breast Cancer Survivor Self-Efficacy Scale** was developed for the larger study and measured survivors' confidence in dealing with concerns related to breast cancer after treatment. The scale used a 14-item, five-point Likert-type scale with responses ranging from 1 (strongly disagree) to 5 (strongly agree). Items included issues such as being able to ask for help when problems arise, dealing with physical symptoms, and emotional issues from having breast cancer. Responses were summed for a total score. Construct validity was supported with a confirmatory structural equation model (Champion et al., 2011). Cronbach alpha reliability was 0.93 in this sample.

Fear of recurrence was measured using **CARS** (Vickberg, 2003). CARS is a two-part instrument developed for survivors assessing overall fear of recurrence (fear of recurrence index) and worries related to recurrence. Subscales include death worries (2 items), health worries (11 items), role worries (6 items), and womanhood worries (7 items). A fifth subscale, parenting worries (2 items), was added on the advice of younger survivors who reviewed the measures prior to the current study and was approved by Vickberg (personal communication, July 6, 2004). All subscales employed a five-point Likert-type response format ranging from 0 (not at all) to 4 (all or most of the time) (Vickberg, 2003). The internal consistency reliability of the subscales ranged from 0.81–0.93.

## Data Analysis

SPSS®, version 14, was used for all analyses. Independent sample  $t$  tests were used to compare differences in fear of recurrence among younger and older survivors. Multiple linear regression analyses were used to test the association between each variable and fear of recurrence while adjusting for the effects of other variables. The full sample of 1,128 was available for the independent  $t$  test; however, because the authors chose not to impute missing data, the SPSS program included a reduced sample of 1,076 within the multiple regression analysis.

## Findings

A total of 1,128 survivors were included in the analysis, with about 45% being diagnosed at 45 or younger and 55% being diagnosed from age 55–70. A majority was Caucasian (92%), married (75%), had at least some college education (64%), and had a household income of \$50,000 or more (62%). All women were treated with chemotherapy and had some type of surgery; 47% had a lumpectomy, 51% had a mastectomy, and about 2% had both.

Research Question 1 tested for differences between the younger and older survivors on the CARS fear of recurrence index and subscales. Overall, younger

women experienced more fear and worry than older women. All  $t$  values for independent tests were significant and ranged from 7.7–15.4 (see Table 2). Women diagnosed at a younger age had a significantly higher mean fear of recurrence index and higher mean worries for health, role, womanhood, death, and parenting compared to women diagnosed at an older age. The greatest difference was seen with the parenting worries subscale.

Research Question 2 sought to determine the mediation effect of breast cancer survivor self-efficacy on antecedent variables in predicting fear of recurrence. Multiple linear regressions were used to test the relationships of the antecedent variables, breast cancer survivor self-efficacy, and fear of recurrence using the Baron and Kenny (1986) method. If the unstandardized regression coefficients changed once breast cancer survivor self-efficacy was added to the analysis, the methods suggested by Frazier, Tix, and Barron (2004) were used to test for significance of the mediation.

The antecedents first were regressed on fear of recurrence. Variables negatively associated with fear of recurrence included age at diagnosis ( $p = 0.001$ ), perceived risk of recurrence ( $p = 0.001$ ), trait anxiety ( $p = 0.001$ ), and breast cancer reminders ( $p = 0.001$ ). Antecedents explained 38% of the variance in fear of recurrence (see Table 3). Other predictors were not significant.

As a second step, breast cancer survivor self-efficacy was regressed on the antecedents. While controlling for other predictors in the model, age at diagnosis was nonsignificantly related to breast cancer survivor self-efficacy. Higher perceived risk of recurrence ( $p = 0.07$ ), knowledge of someone with a recurrence ( $p = 0.004$ ), symptom bother ( $p < 0.001$ ), trait anxiety ( $p < 0.001$ ), and breast cancer reminders ( $p = 0.014$ ) all were related inversely to breast cancer survivor self-efficacy.

As a third step, fear of recurrence was regressed on the mediating variable breast cancer survivor self-efficacy (see Table 4). Breast cancer survivor self-efficacy

**Table 2. Concerns About Recurrence Scale Differences Between Women Diagnosed at Younger and Older Ages<sup>a</sup>**

Variable	Younger (N = 505)		Older (N = 623)		t*
	$\bar{X}$	SD	$\bar{X}$	SD	
Fear of recurrence index	12.2	5.2	8.8	4.5	10.1
Health worries	17.7	10.7	12.5	10.4	7.3
Role worries	7.8	5.5	4.5	4.6	9.4
Womanhood worries	5.1	6.2	2.3	4.3	7.7
Death worries	4.7	2.6	3	2.5	10.2
Parenting worries	3.6	2.8	1.1	1.7	15.4

\* $p < 0.001$

<sup>a</sup>“Younger” refers to participants diagnosed at age 45 or younger; “older” refers to participants diagnosed from age 55–70.

**Table 3. Regression of Fear of Recurrence and Breast Cancer Self-Efficacy on Antecedents**

Variable	SB	SE	t Test	p	Zero-Order Correlation	Semi-partial Correlation	Semi-partial % Variance
<b>Fear of recurrence</b>							
Age at diagnosis	-0.19	0.26	-7.47	< 0.001	-0.3	-0.18	3.2
Perceived risk of recurrence	0.2	0.31	7.95	< 0.001	0.32	0.19	3.6
Knowledge of someone with a recurrence	-0.01	0.28	-0.55	0.581	-0.12	-0.01	0
Recurrence signs	0.02	0.07	0.81	0.421	0.01	0.02	0
Symptom bother	-0.02	0.26	-0.56	0.575	0.26	0.02	0
Trait anxiety	0.25	0.01	9.52	< 0.001	0.41	0.23	5.3
Breast cancer reminders	0.33	0.02	12.7	< 0.001	0.47	0.3	9
<b>Breast cancer self-efficacy</b>							
Age at diagnosis	0.04	0.41	1.61	0.108	0.16	0.04	0.2
Perceived risk of recurrence	-0.05	0.5	-1.83	0.067	-0.16	-0.05	0.3
Knowledge of someone with a recurrence	-0.07	0.46	-2.86	0.004	-0.03	-0.07	0.5
Recurrence signs	0	0.11	0.07	0.947	0.04	0	0
Symptom bother	-0.14	0.43	-5.21	< 0.001	-0.34	-0.13	1.2
Trait anxiety	-0.47	0.02	-16.88	< 0.001	-0.55	-0.42	18
Breast cancer reminders	-0.07	0.03	-2.46	0.014	-0.23	-0.06	0.4

N = 1,076

SB—standardized beta; SE—standard error

Note. For fear of recurrence,  $F(7, 1068) = 95.3$ ,  $p < 0.001$ . For breast cancer self-efficacy,  $F(7, 1068) = 76.3$ ,  $p < 0.001$ 

explained about 18% ( $p < 0.001$ ) of the variance in fear of recurrence. Higher breast cancer survivor self-efficacy predicted lower fear of recurrence.

Finally, fear of recurrence was regressed on antecedent variables and breast cancer survivor self-efficacy. Mediation is indicated when the strength of the relationship between the antecedents and outcome variable is reduced when the mediator enters the analysis (Baron & Kenny, 1986). Therefore, fear of recurrence was regressed on antecedents plus breast cancer survivor self-efficacy (see Table 5). About 18% variance was accounted for by antecedents and self-efficacy on fear of recurrence ( $p = 0.001$ ).

The strength of the relationship among antecedents and fear of recurrence changed significantly when breast cancer survivor self-efficacy was added to the analysis. For each coefficient, a decrease in the regression coefficient once breast cancer survivor self-efficacy was added to the analysis was tested for significance of change (Frazier et al., 2004). The coefficient change was significant ( $p = 0.05$ ) for age at diagnosis, perceived risk of recurrence, trait anxiety, and breast cancer reminders. Specifically, the standardized regression coefficients became smaller (less strength) for age at diagnosis (-1.9 to -1.8), perceived risk of recurrence (2.46–2.34), trait anxiety (0.13–0.077), and breast cancer reminders (0.215–0.205). Breast cancer survivor self-efficacy is a significant partial mediator of the relationships between fear of recurrence and age at diagnosis, perceived risk of recurrence, trait anxiety, and breast cancer reminders. Breast cancer survivor self-efficacy was significantly related to fear of recurrence with a regression coefficient of -0.183 ( $p < 0.001$ ), which explained about 3% of the unique variance in fear

of recurrence. Higher breast cancer survivor self-efficacy predicted lower fear of recurrence.

## Conclusions

The authors first sought to determine whether a difference existed between breast cancer survivors who were diagnosed at age 45 years or younger compared to those diagnosed at 55–70 years in relation to fear of recurrence. While controlling for time since diagnosis and treatment, survivors diagnosed in the younger age group had higher fear of recurrence and related worries than survivors in the older age group, which is consistent with previous research that reported younger age was associated with more troublesome thoughts of recurrence indirectly through the relationship between higher symptom bother and younger age (Clayton et al., 2006). Other researchers have described a relationship between younger age at diagnosis and higher fear of recurrence (Härtl et al., 2003; Hilton, 1989; Mast, 1998; Vickberg, 2003).

The findings suggest women diagnosed at a younger age may be at higher risk for fear of recurrence in general and of specific worries about fear of recurrence. Age group at diagnosis was considered an antecedent variable in the current study and younger age at diagnosis predicted higher fear of recurrence, but not breast cancer survivor self-efficacy. Other antecedent variables, including perceived risk of recurrence, trait anxiety, and breast cancer reminders, predicted fear of recurrence and breast cancer survivor self-efficacy. The relationship of those antecedent variables with fear of recurrence was mediated by breast cancer survivor self-efficacy. Of those

variables, anxiety and thoughts of breast cancer have been explored by others. A study by Mehnert et al. (2009) found that anxiety was related to moderate to high levels of fear of recurrence. After breast cancer is diagnosed, anxiety often has been considered a part of psychosocial distress, a quality-of-life domain that includes fear of recurrence (Ferrell et al., 1998a; Hewitt et al., 2004).

Women with more thoughts about breast cancer triggered by breast cancer reminders had higher fear of recurrence. That finding was supported by qualitative results in the literature (Ferrell et al., 1998b; Vickberg, 2001) and research with older survivors (Clayton et al., 2006). Events that trigger fear of recurrence often were associated with healthcare-related activities such as mammograms, clinic visits, and blood work. Being cognizant of those triggers is an important consideration for survivors and healthcare providers.

Three antecedents did not impact fear of recurrence: knowing someone with a recurrence, knowledge of recurrence signs, and symptom bother. However, other qualitative reports by survivors described knowing someone with a recurrence as a trigger for their own fear of recurrence (Vickberg, 2001). Although the current study's findings indicated that most survivors had a fairly accurate knowledge of recurrence signs, this knowledge was not correlated with fear of recurrence; higher survivors' knowledge of recurrence signs alone did not seem to reduce fear of recurrence. Finally, symptom bother was not related to fear of recurrence, although the presence of breast cancer-related symptoms and non-breast cancer-related symptoms have been associated with thoughts of recurrence (Clayton et al., 2006). The difference in the current study may have to do with the type of symptoms reported. In this study, symptoms were not related to clinical signs of breast cancer, but instead were clinical signs related to breast cancer treatment complications (e.g., numbness, discomfort).

Survivors with higher breast cancer survivor self-efficacy had lower fear of recurrence. In addition, breast cancer survivor self-efficacy mediated the relationship between younger age at diagnosis, higher perceived risk of recurrence, higher trait anxiety, more breast cancer reminders, and higher fear of recurrence, indicating that breast cancer survivor self-efficacy may have a protective effect. Self-efficacy for coping with cancer (Merluzzi, Nairn, Hegde, Martinez Sanchez, & Dunn, 2001) found that patients with higher cancer self-efficacy during treatment and immediately after experienced higher general quality of life, less anxiety, and a greater sense of well-being.

## Limitations

Although having clearly delineated age at diagnosis groups was beneficial for the comparison of fear of recurrence in younger and older survivors, conclusions

cannot be drawn about fear of recurrence in survivors diagnosed from ages 46–54, as these women were not included in the study. The sample primarily included women who were Caucasian and English speaking, so the results may not generalize to non-Caucasian or non-English speaking survivors. Moreover, the study was a cross-sectional survey, which does not allow any conclusions about fear of recurrence over time.

## Implications for Nursing

The study's findings indicate that breast cancer survivor self-efficacy may be an important construct to use in interventions addressing fear of recurrence in breast cancer survivors. Providing breast cancer survivors with the knowledge and skills to deal with the symptoms resulting from breast cancer may help decrease fear of recurrence as well as anxiety and perceived risk of recurrence.

Oncology and family practice nurses can support survivors by validating that fear of recurrence is an ongoing concern for the majority of survivors and that survivors diagnosed at a younger age are at a higher risk for fear of recurrence and worries about health, life roles, womanhood issues, and parenting. Nurses can educate survivors to anticipate common fear of recurrence triggers. For example, the current study's findings and qualitative reports discuss healthcare provider visits as triggers for higher fear of recurrence. Nurses can tell survivors that experiencing fearful responses to upcoming healthcare provider visits is normal and can collaborate with survivors to develop a plan to reduce any quality-of-life interference these understandable fears might cause.

Oncology nurses already possess and use the skills required to build and sustain self-efficacy. According to Bandura (1997), self-efficacy is accomplished through mastery, vicarious experiences, verbal persuasion, and emotional arousal. Nurses coach their patients with information and skill-building to achieve mastery. Nurses also use verbal persuasion (e.g., "You can do this!") to help patients manage symptoms and emotions. In addition, nurses provide knowledge of what is normal

**Table 4. Regression of Fear of Recurrence on Breast Cancer Survivor Self-Efficacy**

Variable	Value
Standardized beta	–0.42
Standard error	0.02
t test	–15.61
p	< 0.001
Zero-order correlation	–0.42
Semipartial correlation	–0.42
Semipartial % variance	17.6

N = 1,126

Note.  $F(1, 1124) = 243.6, p < 0.001$



**Table 5. Variance in Fear of Recurrence Based on Antecedents and Breast Cancer Survivor Self-Efficacy**

Independent Variable	SB	SE	t Test	p	Zero-Order Correlation	Semi-partial Correlation	Semi-partial % Variance
Age at diagnosis	−0.18	0.25	−7.29	< 0.001	−0.3	−0.17	2.9
Perceived risk of recurrence	0.19	0.3	7.72	< 0.001	0.32	0.18	3.4
Knowledge of someone with a recurrence	−0.03	0.28	−1.24	0.216	−0.12	−0.03	0
Recurrence signs	0.02	0.06	0.84	0.4	0.01	0.02	0
Symptom bother	−0.02	0.26	−0.56	0.575	0.26	−0.01	0
Trait anxiety	0.15	0.02	5.14	< 0.001	0.41	0.12	1.4
Breast cancer reminders	0.32	0.02	12.43	< 0.001	0.47	0.29	8.4
Breast cancer survivor self-efficacy	−0.22	0.02	−7.73	< 0.001	−0.43	−0.18	3.2

N = 1,076

SB—standardized beta; SE—standard error

Note.  $F(8,1067) = 95.4$ ,  $p < 0.001$ 

among patients' experiences and refer to trusted support networks that provide vicarious experiences. Emotional arousal may be linked to the ability to act; therefore, nurses assess their patients for emotions that can help motivate them to take needed action or for higher emotional responses that may cause patients to avoid actions and thereby identify those patients who need a referral for more extensive intervention. Therefore, once research provides the information on how survivors build breast cancer survivor self-efficacy, nurses will be prepared immediately to translate this information to practice.

Although the results of this research provide possibilities for intervention, additional research is needed. First, interventions must be defined and tested to develop and strengthen breast cancer survivor self-efficacy. Second, researchers must establish how survivors determine their risk of recurrence and how perceived risk of recurrence relates to actual risk of recurrence (e.g., stage at diagnosis), thus identifying interventions to normalize survivors' perceived risk of recurrence. Finally, breast cancer survivor self-efficacy reduced the effect of younger age at diagnosis on fear of recurrence, so understanding which other variables or combinations of variables share variance with age at diagnosis warrants additional exploration. Identifying one or more variables that influence that

relationship could add to how fear of recurrence is managed, particularly in women diagnosed at younger ages.

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1. Define self-efficacy.
2. What effect do you think self-efficacy would have on fear of breast cancer recurrence?
3. Did the authors of the study find any relationship between the level of self-efficacy and fear of recurrence?
4. Discuss the use of regression analysis in this article. Why was it used? Was it an appropriate statistical method to support the findings?
5. Why do you think breast cancer survivor self-efficacy might provide a protective effect for certain subgroups of breast cancer survivors?

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