

Development and Psychometric Testing of a Breast Cancer Survivor Self-Efficacy Scale

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Breast cancer survivors (BCSs) are the largest female cancer survivor group and include 2.6 million women in the United States (American Cancer Society, 2012). BCSs deal with problems related to the disease and treatment throughout their life. Compared to women without breast cancer, survivors experience more depression, anxiety, fatigue, and sexual dysfunction, as well as decreased marital satisfaction (Minton & Stone, 2008; Von Ah, Kang, & Carpenter, 2008). The construct of self-efficacy has demonstrated effectiveness for developing interventions that enable cancer survivors to manage symptoms, ultimately improving their overall quality of life (QOL) (Hoffman et al., 2009; Merluzzi, Philip, Vachon, & Heitzmann, 2011; Zachariae et al., 2003). The purpose of this article is to present the psychometric development of a breast cancer self-efficacy scale (BCSES) that can quantify self-efficacy for use in interventions that address long-term problems encountered by BCSs.

Self-efficacy is a central construct in Bandura's (1977) social cognitive theory and is defined as an individual's perception of his or her ability to complete a given task. Self-efficacy predicts the effort expended for a given problem and the length of time an individual will maintain a behavior to gain an expected outcome toward a unifying theory (Bandura, 1977). Self-efficacy and future outcome expectations play central roles in behavior change. Self-efficacy includes (a) magnitude (level of task difficulty), (b) generality (whether one believes tasks can be accomplished across several situations or only under limited conditions), and (c) strength (the relative certainty an individual has relative to accomplishing a given task or behavior) (Bandura, 1977; Champion, Skinner, & Menon, 2005).

Bandura (1997) postulated that self-efficacy mediates behavior through cognitive appraisal. Decreased self-efficacy has been associated with physical and psychological distress and lower QOL (Cunningham, Lockwood, & Cunningham, 1991; Han et al., 2005; Lev

Purpose/Objectives: To describe the development of a self-efficacy instrument that measures perceived ability to manage symptoms and quality-of-life problems resulting from the diagnosis and treatment of breast cancer.

Design: Items were developed and content validity assessed. A 14-item scale was psychometrically evaluated using internal consistency reliability and several types of construct validity.

Sample: 1,127 female breast cancer survivors (BCSs).

Methods: Written consents were mailed to the research office. Data were collected via mail and telephone.

Main Research Variables: Demographics, symptom bother, communication with healthcare provider, attention function, fear of recurrence, depression, marital satisfaction, fatigue, sexual functioning, trait and state anxiety, and overall well-being.

Findings: Data demonstrated that the breast cancer self-efficacy scale (BCSES) was reliable, with an alpha coefficient of 0.89, inter-item correlations ranging from 0.3–0.6, and item-total correlation coefficients ranging from 0.5–0.73. Three of 14 items were deleted because of redundancy as identified through high (> 0.7) inter-item correlations. Factor analysis revealed that the scale was unidimensional. Predictive validity was supported through testing associations between self-efficacy and theoretically supported quality-of-life variables, including physical, psychological, and social dimensions, as well as overall well-being.

Conclusions: The BCSES demonstrated high internal consistency reliability, unidimensionality, and excellent content and construct validity. This scale should be integrated into interventions that target self-efficacy for managing symptoms in BCSs.

Implications for Nursing: Nurses working with BCSs may use this tool to assess areas in which survivors might need to build confidence to adequately cope with their specific survivorship concerns.

Knowledge Translation: The use of the BCSES can inform nurse researchers about the impact of an intervention on self-efficacy in the context of breast cancer survivorship, improving the ability to deliver effective interventions. The scale is brief and easy to administer. Results of this study demonstrate clear psychometric reliability and validity, suggesting that the BCSES should be put to use immediately in interventions targeting the quality of life of BCSs.

& Healey, 1999). For example, when a survivor does not believe that he or she can maintain a set schedule of exercise, inactivity can result, increasing fatigue and decreasing QOL. If survivors had increased self-efficacy in their ability to maintain an exercise schedule, routine exercise could be maintained, which is related to decreases in fatigue. A secondary data analysis of cancer survivors found that perceived self-efficacy for fatigue management served as a mediator between cancer-related fatigue and functional status. People with greater perceived self-efficacy for fatigue self-management had better scores on physical function status (Hoffman et al., 2009). Research also has identified a positive relationship between self-efficacy and better adjustment after diagnosis (Lev & Healey, 1999). Patients with greater self-efficacy for dealing with emotional issues experienced less difficulty in their interactions with healthcare providers (Han et al., 2005). Therefore, self-efficacy for a given task will predict effort expended, increasing the likelihood of a positive outcome, which increases overall QOL.

Researchers have used the construct of self-efficacy to build interventions for BCSs that decrease symptom distress. These interventions have demonstrated that equipping women with self-management skills increases self-efficacy and decreases symptom distress encountered during survivorship (Cimprich et al., 2005).

Although several cancer-specific measures for self-efficacy exist, they are not ideal for measuring self-efficacy specific to the needs of BCSs, nor do they exclusively focus on adjustment issues that occur a year or more after initial treatment. For example, the Cancer Behavior Inventory (CBI) contains 45 items and is generic to any type of cancer (Merluzzi & Martinez Sanchez, 1997). Moderate correlations were found among the six CBI factors and constructs such as the Sickness Impact Profile, the Coping Strategies Scale, and an adjustment-to-cancer scale. The time since diagnosis and information about current treatment were not described. The six subscales of the CBI measures a wide range of factors from dealing with treatment and diagnosis to coping with the disease.

A second self-efficacy scale, the Stanford Inventory of Cancer Patient Adjustment (SICPA), was developed from the CBI and is used with patients newly diagnosed with breast cancer. A total of 38 items relate to a patient's ability to cope with challenging situations after diagnosis (Cunningham et al., 1991; Manne et al., 2006). Positive correlations were found between QOL and cancer-related self-efficacy, and negative correlations were found between self-efficacy and the Profile of Mood States. Responses were correlated with symptom outcomes at diagnosis and one year later (Manne et al., 2006). Only two domains of self-efficacy, personal management and affect management, were associated with better psychological outcomes (Manne et al., 2006).

Although cancer-related self-efficacy scales have been developed and psychometrically tested, several concerns limit their usefulness. The current scales have targeted the immediate effects of surgery or chemotherapy, such as pain, nausea, and hair loss. However, problems experienced by survivors after treatment include fatigue, cognitive problems, depression and anxiety, fear of recurrence, marital and sexual difficulties, and concerns about overall QOL. In the first year after treatment, survivors transition from being recipients of care to reengaging as active participants in life.

The scales that have been developed and psychometrically tested are lengthy, limiting their usefulness in a clinical setting. However, the lack of specificity of prior scales to the problems encountered by BCSs after initial treatment is most important. Although all cancer survivors may have some common concerns, many unique problems also arise that are specific to breast cancer, which further necessitates a BCSES that is psychometrically sound, relevant to long-term survivorship issues, and short enough to be clinically useful.

Design

Variables reflecting QOL were used to assess construct validity. Research hypotheses guiding analysis included

- The internal consistency reliability coefficient for self-efficacy will be 0.8 or above, inter-item correlations will be less than 0.7, and the corrected (i.e., item removed from total score) item-total correlations will exceed 0.4 for all items.
- Exploratory factor analysis will identify a unidimensional latent variable.
- After adjusting for demographic and treatment variables, self-efficacy will be significantly associated with constructs in the QOL domains of physical function, psychological function, and social function.
- Overall QOL, as measured by the Index of Well-Being, will be predicted by QOL domain-specific variables, self-efficacy, and demographic and treatment variables.

Initial Item Development

The first step in instrument development is to create a set of items that can be tested with an adequate sample for validity and reliability. The initial set of items was developed using Bandura's conceptual definition of self-efficacy, previous breast cancer survivorship research, breast cancer survivor input, and content experts. Lynn (1986) recommended a two-stage process, with the first step being identification of the full content domain and item generation. After initial development, items were reviewed by two focus groups of BCSs. Focus groups included 6–8 BCSs at least three years from treatment. Focus group participants were given the conceptual

definition for self-efficacy and asked to judge items for relevance, clarity, and inclusiveness of the issues faced by BCSs following active treatment. Content of initial items was confirmed, but wording changes were suggested for increased clarity.

Stage II development for construct validity included a quantitative judgment of items by content experts. Five individuals, including three senior QOL researchers, one BCS, and one clinician with a doctoral degree were asked to participate. Content experts were given the conceptual definition and asked to rate items on relevance and clarity. Stage II, the quantitative judgment of content validity, was completed using the item index of content validity (Item-CVI). Based on comments from the content experts, three items were deleted that were judged to represent social support as opposed to self-efficacy. Two new items were identified as important to content domain by survivors; therefore, two new items were added to the scale: "I am able to identify changes in my body that may be related to a return of my breast cancer," and "I am comfortable calling my healthcare provider if I notice a symptom that may be related to a return of my breast cancer." With these changes, item-CVI again was assessed and found to be 1, rendering an excellent modified kappa statistic of 1 (Polit, Beck, & Owen, 2007). As a last step, three breast cancer clinical experts were asked to assess content validity using the CVI with a modified kappa statistic of 1. As the last estimate of validity, 12 BCSs (at least two years post-treatment) were asked to assess the scale for face validity. The BCSs confirmed that the 14-item breast cancer self-efficacy scale reflected the most relevant issues encountered during survivorship.

Testing for Validity and Reliability With a Sample of Breast Cancer Survivors

BCSs for the initial study were identified through the Eastern Cooperative Oncology Group (ECOG) Statistical Office computerized database. Women identified through this database had participated in breast cancer treatment trials completed through ECOG.

Methods

The Indiana University institutional review board approved the study prior to data collection. Eligible participants were first contacted through their treating physician's office to give consent for contact. After consent was gained from the treating physician, participants were mailed an introductory letter and brochure describing the research study. One week later, a trained research assistant phoned the women to obtain verbal consent and to mail a written informed consent, an authorization form, and the tax documents necessary for the incentive payments. If the BCSs declined to give verbal consent, the call was terminated, and the women were thanked

Age (years)	57.1	11.6
Years of education (N = 1,115)	14.5	2.7
Years since diagnosis	5.9	1.5

Marital status (N = 1,109)

Married or in long-term relationship	836	75
Divorced	80	7
Widowed	104	10
Single	89	8

Education (N = 1,110)

Less than high school	34	3
High school or two-year college	653	59
Four-year college or more	423	38

Income (\$) (N = 1,089)

50,000 or less	403	37
50,001–100,000	442	41
Greater than 100,000	244	22

for their time. For those who provided verbal consent, the recruitment paperwork was returned and questionnaires were mailed to each enrolled individual. Completed questionnaires were checked for accuracy and the data were scanned into a database.

Instruments

Demographic measures such as current age, age at diagnosis, marital status, education, income, race, religion, and treatment-related variables were collected at enrollment and confirmed through a medical record audit after the survey was completed. Support for construct validity of the BCSES used both exploratory factor analysis and assessment of the relationship between self-efficacy and theoretically related constructs from the physical, psychological, and social domains. For the physical domain, fatigue and cognitive difficulties were selected. Measures of depression, anxiety, and fear of recurrence were selected for the psychological domain. For the social domain, marital satisfaction, sexual functioning, and satisfaction communicating with healthcare providers were included. Finally, a measure of overall QOL was included. Except where indicated, all scales used a five-point Likert-type scale.

Fatigue was measured by the 13-item **Functional Assessment of Cancer Therapy–Fatigue (FACT-F)**, which has demonstrated excellent internal consistency (0.9) and test-retest reliability (0.89), as well as good convergent and discriminant validity among adults with cancer (Cella, 1998; Yellen, Cella, Webster, Blendowski, & Kaplan, 1997).

Cognition was measured by the 16-item **Attentional Function Index (AFI)**, which assesses attention and working memory, particularly the ability to formulate

Ask for help when I have problems	0.56	4.3
Deal with the fact that I have breast cancer	0.61	4.6
Deal with physical symptoms from having breast cancer	0.63	4.2
Ask for help for problems related to breast cancer without feeling guilty	0.65	4.3
Handle any fears about breast cancer returning	0.65	3.9
Successfully handle life situations	0.73	4.3
Have a productive work life	0.53	4.3
Successfully work toward personal goals	0.7	4.3
Successfully deal with emotions	0.73	4.1
Identify changes in body related to a return of breast cancer	0.51	3.8
Call healthcare provider if I notice a symptom that may be related to return of breast cancer	0.5	4.4

plans, carry out tasks, and function effectively in daily life (Cimprich, Visovatti, & Ronis, 2011). Participants rated each item from 0 (not at all) to 10 (extremely well or a great deal). The AFI has internal consistency reliability of 0.92. All scores on the AFI showed significant correlations with ability to concentrate, cognitive failures, states of confusion, and mental fatigue ($r = 0.58-0.6$). Discriminant validity distinguished differences between younger and older BCS groups, with age being positively associated with AFI ($p = 0.01$).

Depression was measured by the **Center for Epidemiologic Studies–Depression (CES-D) Scale**, a summated 20-item scale measuring depression in clinical and general populations. The CES-D has had extensive testing in general populations and has demonstrated concurrent, known-group, and construct validity. Internal consistency alphas have ranged from 0.85–0.9, and test-retest reliabilities have ranged from 0.51–0.67 (Radloff, 1977).

The **State-Trait Anxiety Inventory (STAI)** contains two self-report scales measuring state and trait anxiety (Spielberger, Gorsuch, Lushene, Vagg, & Jacobs, 1983). The State Anxiety Scale (STAI Form Y-1) includes 20 statements assessing current feelings, whereas the Trait Anxiety Scale (STAI Form Y-2) includes 20 statements assessing general feelings ($\alpha = 0.97$) (Spielberger et al., 1983).

The **Concerns About Recurrence Scale (CARS)** was developed specifically for BCSs (Vickberg, 2003). The total scale includes four items assessing overall fear of recurrence and 29 items grouped into four subscales that assess the reasons for anxiety regarding recurrence, including worries about death, health, role, and womanhood. The Cronbach alpha was 0.97 in the current sample.

Marital satisfaction was measured by the 15-item **ENRICH Marital Satisfaction Scale (ENRICH-MSS)**, which had an alpha of 0.91 in this sample (Fowers & Olson, 1993). The ENRICH is a multidimensional scale measuring intrapersonal issues including communication, conflict resolution, sexual satisfaction, commitment, and roles. Although tested on heterosexual couples, scales also may relate to gay or lesbian relationships.

Sexual functioning was measured by the seven-item **Sexual Index Scale**, a revised version of existing instruments modified for this study ($\alpha = 0.79$). Factor analysis indicated an overall total score dimension and two subscales: sexual difficulty and sexual enjoyment. Sexual difficulty reflected problems with arousal, lubrication, and orgasm. Sexual enjoyment pertained to the emotional aspect of sexual activity (i.e., sexual interest, sexual thoughts, and the ability to relax and enjoy sexual activities) (Thirlaway, Fallowfield, & Cuzick, 1996).

A scale was developed to measure participant satisfaction with the healthcare provider and includes five items that measure factors related to the healthcare provider: showing respect, trustworthiness, returning calls, knowing the patient, and communication. The summated items assess the feelings of the survivor related to communication with the healthcare provider. The scale alpha in this sample was 0.86.

Index of Well-Being (IWB) is a nine-item semantic differential scale that commonly is used to measure global well-being using adjective extremes such as boring or interesting and enjoyable or miserable. This scale originally was developed to measure well-being in the American population; however, it has been used since as a measure of quality of life in BCSs with an alpha of 0.93 (Campbell, Converse, & Rodgers, 1976; Von Ah et al., 2012).

The **Symptom Bother Scale** was developed by the investigators and included 12 symptoms related to their

Ask for help when I have problems	0.59
Deal with the fact that I have breast cancer	0.64
Deal with physical symptoms from having breast cancer	0.66
Ask for help for problems related to breast cancer without feeling guilty	0.69
Handle any fears about breast cancer returning	0.69
Successfully handle life situations	0.78
Have a productive work life	0.59
Successfully work toward personal goals	0.75
Successfully deal with emotions	0.77
Identify changes in body related to a return of breast cancer	0.53
Call healthcare provider if I notice a symptom that may be related to return of breast cancer	0.52

arms and chest on the operative side of the body. Women responded on a scale ranging from 0 (no bother) to 4 (extremely bothered) for each of the 12 symptoms. Item scores then were summated for an index.

Sample

Participant data for this study were obtained as part of a larger study that compared BCSs with acquaintance controls (i.e., a sample of women who were not diagnosed with breast cancer). The aims of the larger BCS study were to identify differences in BCSs diagnosed at a younger age versus those diagnosed later. Only BCS data were used. Participants included BCSs who were aged 18–45 or 55–70 years at diagnosis, were three to eight years from diagnosis, and had received chemotherapy as a part of their treatment after diagnosis. Three to eight years from diagnosis was considered an adequate length of time to resolve initial problems related to diagnosis and treatment and to identify survivorship issues that were not confounded with the normal aging process. In the current study, the women were aged 28–78 years.

Statistical and Psychometric Analyses

Reliability: Internal consistency reliability was measured with coefficient alpha. The corrected version (i.e., item removed from total score) of item-total correlations was computed. Item-total correlations above 0.3 and below 0.7 were considered adequate.

Validity: Construct validity was measured through exploratory factor analysis and correlation of self-efficacy with QOL domains (i.e., convergent validity). Predictive validity, another type of construct validity, was assessed by predicting overall QOL with self-efficacy and other specific domains of QOL. A common-factor model was estimated using squared multiple correlations as the initial communalities and the principal component method of estimation. The scree plot indicated one major factor and, therefore, rotation was not used. Factor loadings above 0.4 and item-total correlations above 0.3 were considered adequate.

Bivariate correlations of self-efficacy with selected domain-specific measures were first estimated with the Pearson correlation coefficient to determine the relationships between self-efficacy and problems frequently mentioned by survivors. These correlations also were estimated using the partial correlation coefficient to determine whether relationships persisted after adjusting for the covariates that were selected for

AFI	1,125	0.46	1,058	0.42
CARS	1,124	−0.44	1,057	−0.4
CES-D	1,122	−0.43	1,055	−0.4
Communication with HCP	1,122	0.35	1,056	0.33
ENRICH-MSS	843	0.33	843	0.31
FACT-F	1,123	0.38	1,056	0.35
IWB	1,113	0.45	1,050	0.43
Sexual Index Scale	843	0.26	843	0.26
STAI Form Y-1	1,109	−0.51	1,043	−0.49
STAI Form Y-2	1,106	−0.54	1,040	−0.52
Symptom Bother Scale	1,121	−0.31	1,054	−0.26

their theoretical importance. Finally, linear regression was used to assess the total impact of covariates, self-efficacy, and domain-specific QOL variables on overall QOL as measured by the IWB scale.

Results

A total of 1,681 eligible survivors were contacted, and 1,293 gave consent. Of these, 1,127 completed the survey and were included in the sample. Some scales, such as marital satisfaction, required a current partner and a subsample of partnered survivors (n = 843) was used for analyses that involved this variable. The sample demographics revealed mainly a Caucasian and relatively educated population, consistent with women enrolled in clinical trials at ECOG. More than 90% of the sample were Caucasian; therefore, race could not be analyzed. A total of 86% were Christian, with 14% reporting other religions. Table 1 describes the sample characteristics.

Item Analysis

In the first analysis, the correlation matrix of the 14 items was assessed for very high inter-item correlations that would indicate items that might be overly redundant. The correlation matrix identified three items that had inter-item correlations of 0.7 or greater with other items of similar content. Redundant items included “doing the things that are important to me,” “enjoy leisure activities,” and “successfully deal with changes in my life.” Internal consistency reliability analysis was computed with these items deleted and a Cronbach alpha of 0.89 was obtained. Inter-item correlations were appropriately between 0.3–0.6, meeting predetermined criteria.

Current age	−0.05	−1.79	0.074
Years since diagnosis	−0.01	−0.34	0.7353
Married	−0.02	−0.89	0.3759
Years of education	−0.01	−0.5	0.6171
Income (\$)			
50,000–100,000 ^b	−0.09	−2.51	0.0123
Greater than 100,000 ^b	−0.03	−0.82	0.4118
Self-efficacy	0.15	4.24	< 0.0001
Communication with HCP	0.11	3.72	0.0002
Instrument			
AFI	0.02	0.37	0.7145
CARS	0.11	3.28	0.0011
CES-D	−0.14	−2.98	0.003
ENRICH-MSS	0.11	3.47	0.0006
FACT-F	−0.03	−0.69	0.4905
Sexual Index Score	0.04	1.39	0.1652
STAI Form Y-1	−0.1	−2.03	0.0429
STAI Form Y-2	−0.33	−5.8	< 0.0001
Symptom Bother Scale	−0.03	−0.94	0.3484

Item-total correlations ranged from 0.5–0.73, consistent with values endorsed by Nunnally and Bernstein (1994). The item-total correlations and means for the final 11-item scale are shown in Table 2.

Factor Analysis

Exploratory factor analysis was completed and the Eigenvalues for the first four factors were 4.82, 0.65, 0.27, and 0.18, indicating a marked leveling off of Eigenvalues after the first factor in the scree plot, demonstrating one dominant factor. The first factor explained 93% of the variance shared between the 11 variables and 44% of the total observed variance of the 11 variables. The factor loadings for the one-factor solution ranged from 0.52–0.78, well above the 0.4 threshold (see Table 3). These loadings indicate a strong one-factor measurement model for the self-efficacy latent dimension. As a sensitivity analysis, researchers performed factor analysis separately for the younger and older survivors, and results were very similar (i.e., one dominant dimension and similar loadings).

Construct validity was tested by correlating each of the dimensional variables with self-efficacy unadjusted and then adjusted for covariates. The first step in testing relationships was to describe the bivariate correlations between self-efficacy and the identified measures repre-

senting each domain. Table 4 shows that self-efficacy was highly correlated with all of the domains of QOL before and after adjusting for covariates and in the anticipated directions. Overall QOL, as measured by the IWB, was regressed on demographics, self-efficacy, and specific QOL dimensions to confirm the relationship of self-efficacy with overall QOL. Table 5 illustrates the regression results when the relationship variables (marital satisfaction and sexual functioning) were included in the model using the sample of those who were partnered. Self-efficacy was a significant predictor of well-being even after adjusting for demographic covariates and other domain-specific QOL variables. Judging from the relative magnitude of the standardized coefficients (the t values and the p values), the variables that were most strongly associated with well-being were self-efficacy, trait anxiety, worry about recurrence, depression, marital satisfaction, and current communication with the healthcare provider. The combination of all variables in the model explained a substantial amount of the variance (47%) in well-being. The statistical conclusions of the regression remained the same after excluding the two relationship variables and performing the regression on the entire sample without regard to whether the participants were partnered.

Discussion

Results from this study demonstrate that the BCSES for survivors demonstrates excellent internal consistency reliability as well as content and construct validity. This scale is unique in that it addresses problems specific to BCSs and focuses on long-term issues germane to survivorship after initial diagnosis and treatment. Psychometric analysis of the BCSES met all criteria initially hypothesized. Originally, 14 items were identified; however, additional analysis using inter-item correlations led to the discovery of three redundant items that demonstrated correlations of 0.7 or above with other scale items. Redundant items included: (a) do the things that are important to me, (b) enjoy leisure activities, and (c) successfully deal with changes in my life. An overall alpha of 0.89 was retained after removal and the remaining items demonstrated good inter-item correlations, between 0.3–0.6, and item-total correlations from 0.49–0.75. The 11 items were used for all subsequent analyses.

Analysis supported a unidimensional factor with loadings of 0.52 or higher. These results differ from those reported for the SICPA, which defined subscales of coping with medical procedures, activity management, communication, personal management, affective management, and self-satisfaction (Manne et al., 2006). In contrast, the current sample included women who were three to eight years from treatment and in a more stable life situation.

A self-efficacy scale that addresses long-term problems faced by BCSs only is useful to the extent that it can help

identify potential interventions. Therefore, construct validity was particularly relevant to testing the relationships of self-efficacy to frequent problems reported by BCSs. Common physical problems reported in BCSs include fatigue and changes in ability to concentrate or direct attention to relevant issues (Hoffman et al., 2011; McDougall, 2009). In the current study, BCSES was significantly correlated with measures of fatigue and attentional function, suggesting that interventions to increase self-efficacy might help survivors with fatigue and attentional deficit problems.

A frequent finding in BCS studies is that survivors have higher levels of depression and anxiety compared to age-matched controls. In addition, BCSs frequently mention fear of recurrence as a problem (Armes et al., 2009; Báñez, Blasco, Fernández-Castro, & Viladrich, 2009; Cimprich et al., 2005; Costanzo et al., 2007; Hopwood, Sumo, Mills, Haviland, & Bliss, 2010; Lev & Owen, 2000). In this study, the BCSES was significantly associated with depression, anxiety, and fear of recurrence. As self-efficacy increased, depression, anxiety, and fear of recurrence decreased, suggesting that an intervention targeting self-efficacy may improve these psychological problems frequently found in survivors.

The social domain included marital satisfaction, sexual functioning, and perception of adequate communication with the healthcare provider. The variables of marital satisfaction and sexual functioning required a partner for response and, therefore, limited this analysis to the subset of women who were partnered. The relationship of these variables with self-efficacy demonstrates the potential to change outcomes if self-efficacy is increased. All women completed the communication-with-provider scale, which was significantly correlated with self-efficacy, indicating the importance of self-efficacy in the social domain variables.

As a final step, the authors regressed the IWB on demographic variables, self-efficacy, and variables in each of the physical, psychological, and social domains. All QOL variables were significantly related to overall well-being when controlling for demographic variables. In addition, self-efficacy remained a significant predictor even when all other variables were in the equation. The current results were similar to those found by Cunningham et al. (1991) in a heterogeneous sample of 273 patients with cancer, where a strong relationship existed between self-efficacy and QOL. Cunningham et al.'s (1991) analysis showed that QOL problems frequently reported in survivorship literature affect overall QOL and that self-efficacy plays an important role in overall QOL. Researchers have found that, without intervention, the self-efficacy and adjustment for BCSs may decrease over time (Lev, Paul, & Owen, 1999). The significant correlations of the BCSES scores with QOL variables speak to the potential benefits of developing interventions that target self-efficacy in the

large population of BCSs. Bandura's (1997) theoretical model indicated that strategies to increase self-efficacy should involve performance accomplishments, vicarious experience, verbal persuasion, and emotional arousal. Each of those factors could be considered when developing interventions to increase self-efficacy.

Limitations

Although the large sample of BCSs provided ideal data, limitations must be acknowledged. First, the sample was obtained from women who had previously consented to a randomized trial for treatment. These women tend to have higher educational and socioeconomic levels, potentially limiting generalizability of results. Secondly, data were cross-sectional, precluding the ability to determine directionality of the relationship between self-efficacy and QOL variables.

Implications for Nursing

Self-efficacy has been demonstrated to play an important role in increasing behaviors that lead to improved symptom management and QOL in BCSs. The BCSES is brief enough to be used as a screening test for self-efficacy during a visit with the healthcare provider. For example, when survivors are seen in follow-up care, a self-efficacy assessment could be completed at initial check-in. Results could be used by clinicians to discuss areas suggesting low self-efficacy. If a survivor indicated that self-efficacy for handling emotions was low, additional exploration might identify anxiety or depression that needed treatment. Bandura (1997) identified methods to increase self-efficacy, such as performance accomplishment, vicarious experience, verbal persuasion, and emotional arousal. An intervention using vicarious experience might be developed by exploring methods through which other survivors handled emotions related to breast cancer. Self-efficacy as a theoretical construct has the potential to help BCSs deal with symptoms and QOL issues often seen far after initial diagnosis and treatment. Assessing this construct through the BCSES and using results to tailor interventions could significantly improve a survivor's ability to deal with issues resulting from their diagnosis and treatment. Nurses can play an important role in helping BCSs deal with issues resulting from cancer diagnosis and treatment, therefore improving their overall QOL.

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