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## Relationships among optimism, well-being, self-transcendence, coping, and social support in women during treatment for breast cancer

Ellyn E. Matthews\* and Paul F. Cook

College of Nursing, University of Colorado, Denver, CO, USA

### Abstract

**Objective**—The impact of diagnosis and treatment for breast cancer, stressors that affect emotional well-being, is influenced by several psychosocial factors and the relationships among them. The purpose of this study was to investigate the relationship between optimism and emotional well-being (EWB) and the individual and combined mediation of this relationship by perceived social support (SS), problem focused coping (PFC), and self-transcendence in women with breast cancer during radiation therapy.

**Methods**—Ninety-three women receiving radiation treatment for breast cancer completed questionnaires that measured EWB, optimism, SS, PFC, and self-transcendence.

**Results**—Correlational and multiple regression analysis revealed that optimism was positively related to EWB. Of the three mediators, self-transcendence alone was found to partially mediate the relationship between optimism and EWB. The relationship between optimism and PFC was not significant. Optimism was related to SS, but its indirect effect on EWB through SS did not reach significance.

**Conclusions and implications**—During breast cancer treatment, the positive effects of optimism on EWB are partially mediated by a woman's level of self-transcendence. Brief screening of women's optimism may help identify women at risk for psychological distress. Early detection and interventions to promote psychological adjustment throughout the cancer trajectory (e.g. enhancing self-transcendence) should receive attention in future research.

### Keywords

breast cancer; psychological distress; optimism; emotional well-being; self-transcendence

### Breast cancer, radiotherapy, and emotional distress

Despite overall improved survival rates, a diagnosis of breast cancer continues to generate distress in the lives of many women [1–3]. Adaptation to a cancer diagnosis and treatment is influenced by psychosocial resources that women bring to their cancer experience, such as optimism [4], coping strategies [5], and social support (SS) [6–9]. Recent evidence suggests that women with breast cancer continue to experience significant levels of psychological distress, anxiety, hostility, and depression [10,11], which interrupt daily life and diminish quality of life (QOL) [12–15].

Women deal with radiotherapy side effects and feelings of vulnerability during the treatment period [16,17], which can last for years after treatment [18–20]. Greater physical symptoms during treatment predict future cancer-related distress, intrusive thoughts, and general emotional distress [21,22]. Even the wait before and after radiation treatment is described as difficult, boring, and frustrating [23]. Emotional distress is associated with increased non-adherence to treatment [24], poor satisfaction with care, and poor QOL [25,26]. While many studies substantiate the emotional impact of cancer, few studies explore the unique relationship among personal attributes (e.g. optimism, coping, SS) and emotional well-being (EWB).

## Optimism, health, and well-being

Optimism characterizes normal human functioning; individuals use social and cognitive filters to interpret their experiences into the most favorable future outlook within reasonable limits [27]. Optimism can take many forms including *optimistic bias* (the personal belief that positive events and fewer negative events will be experienced compared with other people) [28,29]; *dispositional optimism* (stable inclination to expect the most favorable outcomes) [30]; and *unrealistic optimism* (personal predictions exceed the predictions made by objective indicators) [31]. Optimism–pessimism is considered to be a single bipolar dimension [32]. In this study, optimism is conceptualized as the general tendency to believe good things will happen in the future and bad things will rarely occur [30,33].

Studies over the past three decades provide evidence that optimistic outlook provides a variety of emotional, social, and health benefits [34–38]. Adaptation following a breast cancer diagnosis and EWB are significantly influenced by a complex set of pre-existing psychosocial resources [10,38]. Dispositional optimism acts as a resource that maintains a positive mood, and protects individuals from the potential negative effects of cancer and cancer treatment [4,20,39–45].

Despite evidence of the effect of optimism on well-being during illness, the complex contribution of mediating factors in predicting emotional health is not well studied. Three main correlates of optimism, perceived SS, problem-focused coping (PFC), and self-transcendence emerge from the literature as potential mediators likely to influence EWB, therefore, the purpose of this study is to examine the relationship between optimism and EWB and the role of these mediators separately and taken together. Because greater frequency and intensity of side effects predict reduced EWB, we measured symptom distress and considered it a confounding variable. This allows interpretation of the psychological variables of interest independently of physical distress [21,22]. Scheier and Carver's Behavioral Self-Regulation Model is described in the following sections and provides the framework to understand the proposed direct and mediating relationships, [33].

## Behavioral self-regulation model

Self-regulation is generally defined as those processes, internal and/or transactional, that enable an individual to guide his/her goal-directed activities over time and across shifting circumstances [46]. Regulation implies modification in thought, affect, behavior, or attention via deliberate or automated use of specific mechanisms and skills. Self-regulation is initiated when routine activity or goals are impeded, and it appears to be the stable element in guiding behavior along a specific path to direct an aim or goal [46]. Scheier and Carver posit that individuals continually evaluate the likelihood of achieving aspirations and goals [35], which may be concrete (e.g. purchasing a new car) or abstract (e.g. health, happiness). According to the model, general favorable expectations of achieving goals (i.e. believing good things will happen in the future), influence behavior and mood.

Research suggests a positive expectation for attaining desired goals leads to continued engagement in goal-related activities [35], while unfavorable expectations lead to mental or physical withdrawal from desired goals and activities (e.g. denial, social withdrawal) [35]. As individuals progress toward desired goals, they experience EWB and positive mood; negative mood is experienced when routine activity or goals are impeded [33]. Women with breast cancer are vulnerable to distress and negative mood, to the extent of their unfavorable future expectations and the importance of threatened goals. We consider positive general expectancies (optimism) to be an important cognitive mechanism by which women structure their behavior and continue to pursue valued life goals against the backdrop of a breast cancer diagnosis. The next sections discuss possible mediators of the optimism-EWB relationship in light of the self-regulation model and other theories.

### Optimism, SS, and EWB

SS is a multidimensional concept that includes the quantity of social ties (network size, density, and multiplicity), quality of relationships, and perceived and actual availability of support. The notion of social networks acting as a stress buffer in mental health maintenance is well established. Early theorists suggest that perceived support, which influences EWB by diminishing the appraisal of threat and increasing feelings of mastery, is more consistently related to EWB than network size and density [47,48]. In recent studies, a variety of SS sources and support modalities are associated with well-being and adjustment to the stress of breast cancer [6,8,38,49–51].

Optimistic thinking enhances the perception of social network availability, which diminishes the appraisal of threat, increases feelings of success, [47,48] and improves social desirability [32,52,53]. Optimists report longer friendships [54] are more likely to participate in cancer support groups [55], and experience greater perceived SS while adjusting to stressful life events, thereby buffering stress reactions [56,57]. In addition, one may speculate that more optimistic individuals are less likely to place intense emotional burden on others, thus creating a more gratifying environment for others to provide support [58]. In cancer patients, lower levels of optimism have been correlated with the increased perception that expression of trauma or cancer-related thoughts, feelings, or concerns must be inhibited (social constraint) in spouse and family relationships. Thus, optimists appear more likely to share difficult cancer-related experiences in the context of important social relationships, which can enhance psychological adjustment [59]. While several studies suggest an optimistic outlook is useful in buffering stress and making use of supportive networks, they raise unanswered questions about the relationships among optimism, SS, and EWB when other factors are considered.

### Optimism, coping strategies, and EWB

Optimists may cope more effectively than pessimists based on their appraisal of threat and resultant coping responses [60,61]. Problem-focused (PFC), one type of coping, is directed at defining the problem, generating solutions, and weighing and choosing among alternatives [61]. Optimistic beliefs may diminish threat appraisal and sustain coping efforts in the face of adversity [35,62]. Optimists can appraise stressful events as amenable to intervention and tend to anticipate positive outcomes; thus, they are more likely to choose adaptive, active coping mechanisms than individuals with lower optimism levels [63].

Optimists have been shown to report more PFC responses than pessimists in dealing with breast cancer [60], breast biopsy procedures [45], and areas of health promotion [64,65]. This distinct coping style of optimists contributes to greater EWB in the cancer setting [43,45,66,67]. For example, Schou *et al.* found the positive effect of optimism on QOL is mediated by coping at diagnosis and 12 months after breast cancer surgery [14]. Optimistic

thinking appears to be related to active coping and greater EWB, therefore, replicating these findings is important to further explore additional factors that lead some women to experience long-term distress while others cope effectively.

## Optimism, self-transcendence, and EWB

Human existence is characterized by the capacity for self-detachment and transcendence, such that the human drive for status, power, and pleasure are simply derivatives of the primary human concern: basic striving to find meaning and purpose in life through self-transcendence [68–70]. Finding meaning is manifest in several ways: giving creatively to the world, inspirational experiences, and attitudes when faced with unchangeable situations. Optimists, by virtue of their favorable future expectations, are able to *transcend* difficult, unchangeable situations and turn suffering into human achievement or enlightenment, with an accompanying sense of well-being [69,71].

In the theory of self-transcendence, Reed defines self-transcendence as an expansion of one's conceptual boundaries inwardly through introspective activities, outwardly through concerns about others' welfare, and temporally by integrating perceptions of one's past and future to enhance the present [71]. She proposes self-transcendence promotes EWB, particularly in persons facing end of life, illness, or aging through personal growth, integration of present with past and future, and investing in personal relationships (e.g. accepting diminishing physical capabilities while sharing wisdom with a younger generation or community) [72]. Studies of healthy adults [73], older adults [74], persons with AIDS [75,76], and women with advanced breast cancer [77–81] suggest a strong relationship between self-transcendence and EWB. However, there is little research on the relationship between optimism and self-transcendence, or on self-transcendence as a mediator of the relationship between optimism and EWB.

### Research hypothesis

Based on theory and extant research in optimism and behavioral self-regulation [33,35,60,62], SS [32,38,50,52], coping with stress [5,61,62], and self-transcendence [69,71,78], we hypothesized positive correlations among optimism, SS, PFC, self-transcendence, and EWB. Specifically, we predicted that SS, PFC, and self-transcendence would mediate the effects of optimism on EWB.

## Methods

### Setting

Seven outpatient radiation treatment sites affiliated with midsize, non-profit, community hospitals in the mid-Atlantic region were used for the sample recruitment. Annually, each radiation center treats between 100 and 250 breast cancer patients.

### Sample

Ninety-three women with breast cancer, stage I–IV, between the ages of 39 and 79 currently receiving radiation therapy were recruited for this study. Participation was limited to women aged 39 or older because the highest incidence of breast cancer is reported in this age group, and the incidence of breast cancer in men is too small to accrue a large enough sample for analysis. Physical symptoms of radiation therapy such as fatigue and skin changes have the highest frequency and intensity between week three and the conclusion of treatment [21,22], therefore, limiting the sample to participants at or beyond the 3 weeks of treatment allows a clearer interpretation of the relationships of interest by controlling for temporal variation in side effects. To mitigate threats to internal validity, persons receiving concurrent

chemotherapy, with marked impairment of social or occupational functioning according to *Diagnostic and Statistical Manual of Mental Disorders (DSM-IV)* criteria [82], previous cancer history or radiation therapy were ineligible for study participation

### Instruments/measures

The Personal Demographic Data Sheet and Medical Record Data Sheet were used to gather demographic, disease, and treatment information. The variables of interest were measured using self-report surveys previously determined to be reliable and valid. Table 3 presents the Cronbach's  $\alpha$  values for each instrument. Participants responded to each item based on how they felt at the time of survey completion, unless noted otherwise.

The Positive Affect Scale (PA) of the Positive and Negative Affect Schedule is a valid and reliable 10-item self-report tool designed to measure EWB on a 5-point summated rating scale ranging from not at all (1) to extremely (5) [83]. Respondents are asked how they feel with regard to 10 descriptors of positive affect (e.g. attentive, alert, excited). PA scores range from 10 to 50; higher scores indicate greater EWB.

The Life Orientation Test (LOT) is a 12-item self-report survey designed to measure global optimism on a 5-point scale ranging from strongly disagree (0) to strongly agree (4). The LOT is composed of four positively worded, four negatively worded (reverse scored), and four filler items to disguise the purpose of the test that are not included in the scoring. Scores for optimism range from zero to 32, with a higher score indicating greater optimism. Instrument reliability is established in breast cancer patients [60] and mixed cancer patients [84].

The Social Support Questionnaire (SSQ) is a self-report instrument designed to measure the degree of perceived SS from five sources (spouse, family member, friend, nurse, physician) with regard to the present illness on a 5-point rating scale ranging from strongly agree (5) to strongly disagree (1) [85]. A total score is calculated from all five sources on each of eight items; scores range from 40 to 200 with higher scores indicating higher levels of perceived support. The SSQ reflects the specific sources and support needs of breast cancer patients, and high internal consistency has been reported in breast cancer patients [85–89].

The Jalowiec Coping Scale is composed of the problem-focused subscale (15 items) and the emotion-focused subscale (25 items). The subscales are self-report tools designed to assess, on a 5-point summated rating scale ranging from never (1) to always (5), the extent to which respondents use problem-focused or emotion-focused coping [90,91]. Problem-focused scores range from 15 to 75, with higher scores indicating greater use of PFC.

The 15-item Self-Transcendence Scale (STS) measures interpersonal, intrapersonal and temporal experiences, activities, and perspectives indicative of expanded self-boundaries [74]. Examples of items include 'sharing one's wisdom with others' and 'finding meaning in one's past experiences'. Scores range from 15 to 60; higher scores indicate greater self-transcendence. The STS is a valid and reliable measure in older adults and breast cancer patients [73,74,78].

The Symptom Distress Scale (SDS) is a 13-item self-report tool designed to measure, on a 5-point summated rating scale ranging from normal or no distress (1) to extensive distress (5), the extent of symptom distress experienced during the past 7 days related to 13 physical symptoms that are directly relevant to radiation treatment [92,93]. Values range from 12 to 60; higher scores indicate greater symptom distress. Reliability, content, and convergent validity of the SDS have been established for breast cancer patients.

## Study procedure

Institutional review board approval was obtained from each recruitment site. Radiation therapy staff identified interested, eligible women when they arrived for treatment. Women were informed about the study, and written, informed consent was obtained. Study participants then completed the instruments.

## Statistical analysis

Descriptive statistics were calculated to summarize the sample characteristics. Correlations between demographic and treatment variables and the study's outcome variables were calculated before the main analysis. EWB was unrelated to age, employment, caregiver role, marital status, education, income, chemotherapy history, or disease stage (all  $p$ 's > 0.05). Mediation relationships were tested using regression analysis as proposed by Baron and Kenny (1986) using three regression equations to test each mediator: First, the mediator was regressed on the independent variable; second, the dependent variable was regressed on the independent variable; and finally, the dependent variable was regressed on the independent variable and on the mediator variable [94]. Based on this approach, path diagrams were generated to depict the mediated and non-mediated relationships between constructs in the model [95]. Although structural equation modeling was considered to test the overall model's adequacy of fit, this approach was not used due to sample size limitations [96].

## Results

### Descriptive analyses

Of the 97 women approached to participate in this study, 93 agreed to participate, a 96% participation rate. The demographic characteristics of the sample are presented in Table 1. As shown in the table, the typical participant in this study was Caucasian, married, and well educated. Various religious affiliations were represented (Jewish, Protestant, Greek Orthodox, Unitarian, Russian Orthodox, Hindu, and Muslim) but the largest number of participants were Catholic 46 (49.5%). Most women were not primary caregivers for anyone in their household. Employment included full time employees (33.3%), homemakers (18.3%), and retirees (33.3%).

### Clinical history

Selected clinical characteristics are presented in Table 2. Eighty-three women were diagnosed with stage I or II breast cancer (89%), and most participants were postmenopausal (67.7%), with a mean age of 59.7 years (SD = 11.2 years, range: 39–89). About two-thirds of participants (64.5%) received only radiation therapy after breast surgery, with the remaining 33 participants (35.5%) receiving chemotherapy before radiation therapy. Chemotherapy regimens given before radiation therapy included cyclophosphamide and doxorubicin (CA); cyclophosphamide, methotrexate, and fluorouracil (CMF); cyclophosphamide and docetaxel; and sequential doxorubicin-CMF.

Participants' scores on the study variables, presented in Table 3, were generally consistent with those of similar cancer populations as reported in the literature. However, optimism scores, which ranged from 0–33 ( $M = 21.87$ ,  $SD = 6.02$ ), were lower than those reported by women in a previous study with suspected breast cancer or a recent diagnosis of early breast cancer ( $M = 25.63$ ,  $SD = 5.34$ ) [4]. The scores of women with a possible or recently confirmed diagnosis of breast cancer may be elevated due to optimistic messages and initial adjustment following diagnosis. By contrast, female college students' scores on the LOT ( $M = 21.4$ ,  $SD = 5.22$ ) were similar to those in this study and more consistent with the view that the LOT measures generalized optimism regardless of situational factors [35].

## Testing for mediators

All regression analyses controlled for the effect of symptom distress on well-being, which was statistically significant,  $F(1, 90) = 18.0, p < 0.001$ . After controlling for symptom distress, optimism positively predicted well-being,  $F(1, 89) = 15.3, p < 0.001$ . This satisfied the first requirement of mediation: a significant relationship between the predictor and the criterion variable. Inclusion of optimism increased the adjusted model  $R^2$  from 0.157 (symptom distress alone) to 0.273.

In the second step of the test for mediation, we examined the relationship between each of the potential mediators and the predictor variable. Table 4 presents a correlation matrix for all variables in the mediation model. All potential predictors were significantly related to well-being. In addition, significant relationships were observed between optimism and self-transcendence, and between optimism and SS. In the second step of Baron and Kenney's test for mediation [94], there must be a significant relationship between each proposed mediator and the outcome variable; because there was no relationship between optimism and PFC, coping was discarded as a potential mediator at this point in the analysis. We also examined emotion-focused coping as a potential mediator in an exploratory analysis, but found a similarly non-significant relationship with optimism ( $\beta = -0.29, p = 0.055$ ) and EWB ( $\beta = -0.12, p = 0.10$ ). The other two potential mediators, SS and self-transcendence, were retained.

For variables where the first two requirements for mediation were met, the analysis tested the effect of predictor and mediator variables together on the criterion variable. Self-transcendence predicted EWB after controlling for optimism,  $F(1, 88) = 15.6, p < 0.001$ , and the indirect effect of optimism through self-transcendence after controlling for symptom distress using the Sobel test [97] was statistically significant,  $z = 2.64, p = 0.008$ . Although the effect of optimism on well-being decreased in this model, the optimism/well-being relationship remained significant,  $F(1, 88) = 6.43, p = 0.013$ , indicating that self-transcendence only partially mediated this relationship. Together with symptom distress, optimism and self-transcendence accounted for 37.6% of the variance in well-being.

SS also predicted EWB after controlling for optimism,  $F(1, 88) = 4.74, p = 0.032$ . However, the effect of optimism on well-being was relatively unchanged by the addition of SS support to the model,  $F(1, 88) = 10.6, p = 0.002$ , and the inclusion of SS improved the total adjusted model  $R^2$  only from 0.273 (with optimism and symptom distress) to 0.302. Furthermore, the indirect effect of optimism through SS (Sobel test) after controlling for symptom distress was non-significant,  $z = 1.47, p = 0.14$ . Therefore, although there was a slight decrease in optimism's direct effect when SS was included in the model, the results suggest that the effect of optimism on well-being was *not* mediated by SS.

In a final step, all three potential mediators were entered into one equation to examine their combined effects on well-being, again after controlling for symptom distress (Figure 1). Consistent with prior analyses, well-being was significantly predicted by optimism and by self-transcendence, but not by SS or coping.

## Discussion

The study represents an initial attempt to understand the role of personal characteristics in explaining the association between optimism and EWB during radiation treatment from breast cancer. Although the results must be interpreted with care due to the cross-sectional design of the study, they nonetheless suggest important, previously unexamined mechanisms by which optimism may affect EWB.

The indirect affect of optimism through perceived SS was non-significant in the current study, although the inclusion of SS in the model did produce a non-zero change in the optimism–well-being relationship that might have been significant with greater statistical power. The current study’s findings support the notion that optimism and SS each improve EWB independently (additive effects), but do not support a mediational hypothesis about inter-relationships between optimism and SS. This is consistent with recent studies of women’s adjustment to breast cancer relative to SS [98–100] and optimism [20,38,101].

PFC strategies, characterized by fighting spirit and less hopeless/helplessness, are reported to mediate the influence of optimism on QOL in women at diagnosis and 12-months after breast surgery [38]. Among the women with breast cancer in the current study, the relationship between optimism and PFC was in the expected direction but was not significant. There are several possible explanations. PFC strategies may be used when problems are appraised as amenable to change and where individuals believe that something constructive can be done about the stressor [102]. A cancer diagnosis may be viewed as a situation that must be accepted, rather than an event that might involve actions and goals; in keeping with Scheier and Carver [102] conclusion that ‘emotion-focused coping is more likely when people believe the situation is one that must be endured’ (p. 187). However, in this study emotion-focused coping was not related to either EWB or optimism.

Optimistic women may use fewer coping strategies, either problem-focused, or emotion-focused, if they do not see the need for these strategies. For the early stage breast cancer patient receiving radiation therapy, many of the PFC strategies such as understanding the problem, gathering information, and thinking through ways of handling the situation, may have been achieved before the start of treatment. Once the treatment phase is underway, the focus may be on getting through the treatment and getting on with life. Individuals often recognize that cancer is a life-long illness, thus adjusting their thinking about the meaning of good health. Planned actions and specific outcomes may not be as appropriate with uncertain health goals.

Alternatively, the meaning of the illness may be very relevant to the coping process. Women may not view the diagnosis as a ‘problem’ to be changed, but the way cancer is framed can be changed or even transcended, according to the self-transcendence theory. Specifically, PFC (which in this context may also be related to ‘fighting spirit’) may still have relevance and meaning, but the type of actions taken may be different from those measured by the PFC instrument used in the current study.

A significant univariate correlation between PFC and EWB does support the notion that early confrontation of problems has a positive influence on EWB. It appears that appropriate use of a variety of diverse strategies in the day-to-day experience of cancer may be a healthy adaptation [103].

Findings in this study substantiate Reed’s theory of self-transcendence and add to the evidence in support of the relationship between optimism and self-transcendence [73,104,105]. For most individuals including cancer patients, maintaining an interest and planning for the months or years ahead, regardless of the uncertainty of the future, is a strong and basic need. Self-transcendent thoughts and behaviors are consistent with the drive to maximize the future, which may be expressed as ‘realizing what is important in life’ and wanting to be remembered for one’s work or one’s impact on others. This drive to find meaning is also consistent with research reporting a positive relationship between optimism and benefit finding in women with breast cancer [106–108].

Women lacking optimistic expectations are less likely to exhibit self-transcendent attitudes and behaviors. It is also possible that this relationship is bi-directional, such that self-



transcendent behaviors and beliefs may contribute to an optimistic outlook. Breast cancer survivors who help other women may gain a sense of purpose and a future goal. Support groups operate with the expectation that there are reciprocal benefits for participants. As women with breast cancer experience increased optimism, self-transcendence (evidenced by increased purpose, future thinking, and engagement in reciprocal relationships) may take on greater significance and contribute to EWB.

Self-transcendence exerts a strong and dominant influence on EWB, yet it is not so strong as to indicate an overlap with other study variables. In the uncertain trajectory of cancer, EWB may be more relevant to finding meaning and resilience in a negative situation, than thinking in a positive way [109]. In this study, the use of specific coping strategies (either PFC or emotion-focused coping) was not related to optimism. Therefore, the mediation of optimism by self-transcendence cannot itself be explained by self-transcendent individuals' use of specific coping attitudes or behaviors. Self-transcendence clearly is different from the construct of coping, and has different effects.

A remarkable quality of human existence is the capacity to maintain happiness and QOL during difficult physical and emotional times. The ability of breast cancer patients to manage therapy and to reach out beyond themselves to find meaning and help others is reflected in increased EWB. However, owing to the correlational aspect of the study, we also consider the possibility that women with greater well-being had more energy, and more motivation to expend on self-transcendent beliefs and activities. Longitudinal research is needed to clarify this relationship.

Study limitations should be noted. This study was limited by its size and the fact that data were all collected at one time period, a feature that precludes any definite conclusion about the causal order of optimism and self-transcendence. However, a causal role for optimism is consistent with the theory and literature reviewed in the introduction to this paper. Further research using a longitudinal design is needed to clarify this issue. In addition, the only measure of EWB was the PA, which places some limitations on the meaning of the outcome given that EWB is not the only important psychosocial outcome for cancer patients. For example, another important aspect of adjustment to illness is remaining engaged in usual activities [32].

The social homogeneity of the study sample also limits inference. Few minority participants were included in the sample, despite multiple sites for data collection; thus, the results of the present study are not as generalizable to ethnically diverse women with breast cancer. Similarly, only participants at a particular point in their disease course were recruited; these data suggest relationships among the study variables during treatment but examination of these variables throughout the cancer trajectory would enhance understanding of these factors over time. This study also had several important strengths, including the simultaneous examination of several potential mediators. Precursors to well-being have not been widely studied, and this study raises interesting questions about the importance of optimism in patients' adjustment during treatment, specifically radiation therapy.

## Conclusions and implications for research and practice

This study was initiated to increase our understanding of the predictors and mediators of emotional well-being (EWB). Our findings led us to conclude that the positive effect of optimism on EWB is partially mediated by self-transcendence. Therefore, assessment of optimism and self-transcendence may have practice implications.

Routine use of screening tools for psychosocial assessment, including level of optimism, may facilitate early identification and intervention for women who are at risk for

psychosocial distress during and after cancer treatment [20]. Consistent with the behavioral self-regulation model, dispositional optimism levels have been shown to influence the extent to which cancer patients set physical and psychological health behavior goals and persevere in their pursuit of these goals after diagnosis and treatment [110]. Clinically, optimism levels could inform the design and implementation of health programs that take advantage of 'readiness' for health behavior change in breast cancer survivors.

The surveys in this study have been used primarily in research settings, and more inquiry is needed to determine their usefulness in clinical practice. Care environments that support facing feelings directly while restructuring feeling in a supportive social context may increase the experience of well-being. In addition to clinical recommendations, this study raises research implications.

Based on the findings, the following proposals are made for future research: (1) examine the complex relationships between optimism and various social support (SS) sources in cancer patients, (2) identify factors that foster or increase self-transcendence in women with breast cancer, and (3) replicate this study in a more ethnically diverse sample to identify any cultural factors that may influence the relationships studied in this research.

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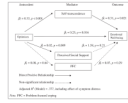
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**Figure 1.**  
Combined mediation model



**Table 1**

## Selected demographic data

Variable	Number	Percentage
Ethnicity		
Caucasian	87	93.5
African American	4	4.3
Hispanic	1	1.1
Other	1	1.1
Marital status		
Married	58	62.4
Living with partner	3	3.2
Never married	7	7.5
Divorced	5	5.4
Widowed	20	21.5
Religion		
Catholic	46	49.5
Jewish	19	20.4
Protestant	17	19.4
Other	10	9.3
Employment status		
Full time	31	33.3
Part time	8	8.6
Retired	31	33.3
Homemaker	18	18.3
Disabled	5	5.4
Education		
Less than high school	5	5.3
High school/tech school	44	47.3
College	27	29.0
Graduate school	17	18.3

**Table 2**

Selected clinical data (*N* = 93)

Variable	<i>N</i>	%
Breast cancer stage		
Stage I	62	66.7
Stage II	21	22.5
Stage III	9	9.7
Stage IV	1	1.1
Treatment		
Surgery and radiation	60	64.5
Surgery, chemotherapy and radiation	33	33.5
Chemotherapy within the last 15 months:		
CMF	9	9.6
Sequential doxorubicin+CMF	8	8.6
Cyclophosphamide+doxorubicin	10	10.7
Doxorubicin+docetaxel	2	2.2
Unknown chemotherapy	4	4.3
Weeks in radiation therapy		
Week 3	37	39.8
Week 4	24	25.8
Week 5	17	18.3
Week 6	11	11.8
Week 7	4	4.3

**Table 3**Descriptive statistics and Cronbach's  $\alpha$  for study variables

Variable	M	SD	Range	$\alpha$
PA	36	6	20–50	0.73
LOT	22	6	0–32	0.86
SSQ	104	12	74–129	0.76
PFC	46	9	15–70	0.82
STS	50	5.5	30–60	0.78
SDS	19	5	12–35	0.75

Note: PA, Positive Affect (well-being); LOT, Life Orientation Test (optimism); SSQ, Social Support Questionnaire (perceived social support); PFC, Problem- Focused Coping Scale; STS, Self-Transcendence Scale; SD, Symptom Distress Scale.

**Table 4**

Correlation matrix of study variables (one-tailed tests of significance)

	1	2	3	4	5
(1) Well-being	1.00				
(2) Optimism	0.38**	1.00			
	$p < 0.001$				
(3) Social support	0.31**	0.27**	1.00		
	$p = 0.002$	$p = 0.005$			
(4) Problem-focused coping	0.25**	0.05	-0.01	1.00	
	$p = 0.01$	$p = 0.33$	$p = 0.45$		
(5) Self-transcendence	0.47**	0.36**	0.40**	0.46**	1.00
	$p < 0.001$	$p < 0.001$	$p < 0.001$	$p < 0.001$	

\*  $p \leq 0.05$ .

\*\*  $p \leq 0.01$ .