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Original Article

Post-Treatment Symptoms of Pain, Anxiety, Sleep Disturbance, and Fatigue in Breast Cancer Survivors

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ABSTRACT

Background: In part because of improvements in early detection and treatment, the number of breast cancer survivors is increasing. After treatment, however, breast cancer survivors often experience distressing symptoms, including pain, sleep disturbance, anxiety, and fatigue; at the same time, they have less frequent contact with health care providers. Pain commonly co-occurs with other symptoms and the combination of symptoms contribute to the amount of distress experienced by survivors. Previous studies of post-treatment symptoms include primarily urban and white women.
Aims: The purpose of this study was to describe the post-treatment cluster of symptoms, to examine the correlations among these symptoms, and to examine the role pain intensity may play in understanding the variation in sleep disturbance, fatigue, and anxiety in a racially diverse sample of rural breast cancer survivors.
Design: The theoretical framework for this descriptive correlational study was the theory of unpleasant symptoms.
Settings: Outpatient university-affiliated cancer clinic.
Participants/Subjects: Forty women who were between 6 months and 5 years post breast cancer diagnosis.
Methods: Participants completed the following self-report instruments: Patient Reported Outcomes Measurement Information System of pain intensity, pain interference, anxiety, and sleep disturbance and the Piper Fatigue Short Form 12.
Results: The average age of participants was 58 years, and 57.5% were black. Most women reported sleep disturbance (78%), pain interference (68%), and pain intensity (63%) above the national average for an American adult. Black women reported higher pain intensity than whites. There were moderate to strong correlations among the symptoms (range r = 0.35-0.89).
Conclusions: Nurses and health care providers in primary care settings need to screen for symptoms, and nursing interventions are needed to assist breast cancer survivors to manage distressing symptoms.

Breast cancer is the most common new cancer diagnosis in women in the United States (American Cancer Society, 2018). According to the National Cancer Institute (2018), an estimated 266,120 women in the United States will be diagnosed with invasive breast cancer in 2018. Most women are diagnosed with early stage I and II breast cancer, and the 5-year survival rate for the years 2008 through 2014 was greater than 89% (National Cancer Institute, 2018). However, many survivors experience symptoms after adjuvant therapy (radiation and/or chemotherapy after primary surgical treatment) for breast cancer. Survivors rarely experience just a single symptom, and researchers often examine symptoms that co-occur or cluster (Given & Given, 2013). Heinze and Williams (2015) found that breast cancer survivors (N = 51) experienced an average of 12 symptoms at 6 months to 18 years after initial therapy. In a systematic review of 21 studies of breast cancer survivors, common symptoms experienced for 1-2 years

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after radiation and chemotherapy included fatigue (16%-49%), sleep disturbance (59%) anxiety (45%-48%), and pain (26%-47%) (Harrington, Hansen, Moskowitz, Todd, & Feuerstein, 2010). Further, Harrington et al. (2010) found that for some breast cancer survivors, these same symptoms persisted for 2-5 years, with prevailing symptoms being fatigue (20%-35%), sleep disturbance (14%), anxiety (15%), and pain (19%-41%).

Lester et al. (2015) identified several symptom clusters present in the first 3 months after initial radiation and chemotherapy. Two of these symptom clusters resulted in moderate to high distress: the *physical* cluster (fatigue, sleep disturbance, and pain) and the *emotional* cluster (worry, nervousness, and fear). The prevalence of these two clusters was 48%-56%, and symptom severity was unrelated to stage of disease (Lester et al., 2015). During survivorship (6 months to 6 years after treatment), the prevalence of these symptoms decreased, with 23% reporting neuropathic pain, 25% reporting fatigue, 22% reporting sleep disturbance, and 17% reporting depression (Befort & Klemp, 2011). In a telehealth intervention study for cancer pain and depression, Kroenke, Johns, Theobald, Wu, and Tu (2013) found that the most commonly experienced co-occurring symptoms were fatigue (97%) and sleep disturbance (78%). Other research found correlations among musculoskeletal pain, fatigue, sleep disturbance, and depression in breast cancer survivors who received aromatase inhibitors (Mao et al., 2014). For patients with breast cancer who received radiation or chemotherapy, a psychoneurological cluster of depressed mood, cognitive disturbance, fatigue, insomnia, and pain varied in intensity depending on performance status at start of treatment and whether the patient had had previous cancer treatment (Kim, McDermott, & Barsevick, 2014). Because not all breast cancer survivors experience these clusters, researchers seek to understand the variation among symptom clusters. Older age (Roiland & Heidrich, 2011) and premenopausal status may account for some of the variation among women with breast cancer. However, it is not known what other factors account for this variation and what treatments may be effective in assisting to reduce symptoms.

Reports of pain vary widely among breast cancer survivors, with pain affecting 25%-57% of these patients (Andersen & Kehlet, 2011; Bell et al., 2014; Green, Hart-Johnson, & Loeffler, 2011; Knobf, 2014; Laroche et al., 2014). Variations in prevalence estimates may be due to differences in types of pain assessed. Some researchers focused their studies of pain on specific locations such as surgical site. When women were asked about breast pain specifically, 45% reported experiencing breast pain for 3 or more months; of these women, 80% reported that they had experienced breast pain for more than 5 years (Bell et al., 2014). Wang et al. (2016) conducted a meta-analysis of studies of persistent breast cancer surgical pain and found that persistent pain was associated with having an axillary node dissection, pre- and postoperative pain intensity, and receiving radiation therapy. Younger women experienced more persistent pain (Wang et al., 2016). Others researchers have included pain at various sites like breast, arm, chest, and shoulder in their assessment and found that 49% of breast cancer survivors experienced pain (de Menezes Couceiro, Valenca, Paposo, de Orange, & Amorim, 2014). Still other researchers examined generalized joint and muscle pain associated with aromatase inhibitors and found a prevalence of 57% (Laroche et al., 2014). Women with breast cancer history report similar prevalence (80%) of joint pain compared with women of similar age without breast cancer history but report greater pain interference with quality of life (Fenlon et al., 2013).

A gap in our understanding of breast cancer survivors' symptom experience is the lack of racial diversity in study samples. Participants in previous studies included predominantly white women. For example, percentages of white participants were reported to be 77% (Mao et al., 2014), 80% (Kroenke et al., 2013), 96% (Roiland & Heidrich, 2011), and 97% (Befort & Kemp, 2011). It is important to understand the experience of black women with breast cancer because their symptom burden may differ from that of white women. Also, there is evidence of racial disparities in pain management (Baker, O'Connor, & Krok, 2014; Meghani, Byun, & Gallagher, 2012; Meghani et al., 2014). Unrelieved pain interferes with sleep and increases fatigue and anxiety (Green et al., 2011).

Purpose

The purpose of this study was to describe the symptom cluster of pain, sleep disturbance, anxiety, and fatigue; to examine the correlations among these symptoms; and to examine the role pain intensity may play in understanding the variation in sleep disturbance, fatigue, and anxiety in a racially diverse sample of breast cancer survivors.

Theoretical Framework

The theory of unpleasant symptoms provides the framework for this study (Lenz & Pugh, 2013). The theorists posit that symptoms occur together and interact with each other in various ways. Symptoms may occur concurrently, precede each other, or give rise to new symptoms. With multiple symptoms, the burden on the person is greater than the simple number of symptoms. Each symptom can vary in timing, intensity, distress, and quality; the cluster of symptoms can exacerbate each other. Additionally, the symptoms are influenced by physical, psychological, and situational variables, and the symptoms result in consequences such as decreased quality of life. For the population of interest, the physical factors are breast cancer stage, type of initial treatment, time since initial breast cancer treatment, hormonal treatment, and concurrent menopausal symptoms. The psychological factor is anxiety. Some evidence suggests that negative psychological thoughts exacerbate physical symptoms (Dupont, Bower, Staton, & Ganz, 2014). The situational factors include their socioeconomic status and social support.

Research Questions

The research questions were as follows: What is the prevalence of pain, sleep disturbance, anxiety, and fatigue in a sample of breast cancer survivors who have received adjuvant radiation and/or chemotherapy after surgery for stages I-III breast cancer? What are the correlations among the symptoms of pain, sleep disturbance, anxiety, and fatigue? Are there differences between black and white women in pain, sleep disturbance, anxiety, and fatigue? Are there differences in sleep disturbance, anxiety, and fatigue between those women who report high pain intensity and those who report low pain intensity?

Methods

Study Design

This descriptive correlational study included a convenience sample of women attending an outpatient cancer clinic. The women completed six standardized instruments during the clinic visit.

Setting and Sample

The study was conducted at an outpatient clinic of a university-affiliated cancer center in rural southeastern United States. This

cancer center serves 29 counties in eastern North Carolina and provides comprehensive cancer care for a diverse population. Inclusion criteria were diagnosis of breast cancer stages I-III, status post–initial radiation or chemotherapy for breast cancer, and English speaking. All women who met the inclusion criteria and were at a follow-up visit for breast cancer between June and August 2015 were invited participate in the study. Forty-four women met the inclusion criteria and four chose not to participate because of "lack of time." One Spanish-speaking individual was excluded because instruments were in English and researchers were not bilingual.

Procedures and Data Collection

The study was approved by the University-Medical Center Institutional Review Board. Research assistants explained the study to potential participants. Those agreeing to participate signed an informed consent. Data were collected on an iPad and stored on a secured network drive maintained by the Assessment Center: Patient-Reported Outcomes Measurement Information System (PROMIS) housed at Northwestern University.

Instruments

The PROMIS repository contains a number of self-reported outcome measures for use by researchers and clinicians. For this study, Pain Intensity, Pain Interference, Sleep Disturbance, Anxiety and Emotional Support PROMIS instruments were used. These measures were developed to provide consistent, comparable findings across research studies, and concurrent validity was established by correlations with legacy measures such as the Brief Pain Inventory and the 36-item Short-Form Health Survey mental health domain (Bevans, Ross, & Cella, 2014). All scores are converted to T scores with a normalized score of 50 and a standard error of 1.

The participants completed two PROMIS instruments for pain: Pain Intensity 3a and the Pain Interference 6a. For pain intensity, participants are asked to rate their worst pain in the last 7 days and their average pain in the last 7 days on a Likert scale of 1-5 (1 = no pain, 5 = very severe pain). Pain Interference is composed of six questions that measure the effect of pain on activities (cognitive, social, physical, and recreation) with a 5-point Likert scale (1 = not at all, 5 = very much). The Pain Intensity and Pain Interference results were internally consistent, with reported α scores of .91 and .99, respectively (Bartlett et al., 2015). To measure sleep disturbance, participants completed the PROMIS Sleep Disturbance 8a, which is composed of eight questions. Participants report their rating of their overall quality of sleep as well as seven additional items related to aspects of the quality, depth, and restorative nature of sleep on a 5- point Likert scale (1 = not at all, 5 = very much). Sleep Disturbance was internally consistent ($\alpha = .98$) (Bartlett et al., 2015). Participants also completed the PROMIS Anxiety7a, which asks participants to report their level of anxiety over the past 7 days on a 5-point Likert scale (1 = never, 5 = always). The Anxiety 7a was internal consistent ($\alpha = .97$) (Bartlett et al., 2015).

The final instrument completed by participants was the Piper Fatigue Scale 12 (PFS-12), which is a 12-item Likert 0-10 scale. Reeve et al. (2012) reported that PFS-12 content validity of the instrument was established. PFS-12 includes four subscales with three items each (behavior, affective, sensory, cognition/mood). When used in a diverse population of breast cancer survivors, the PFS-12 was internally consistent for overall score ($\alpha = .92$) and for subscales (behavior, $\alpha = .89$; affective, $\alpha = .87$; sensory, $\alpha = .87$; and cognition/mood, $\alpha = .87$) (Reeve et al., 2012). The total score and each of the subscale scores range from 0 to 10. The recommended cut-point scores recommended for the PFS-12 are as follows: 0 = no fatigue, 1-3 = mild fatigue, 4-5 = moderate fatigue, and 7-10 = severe fatigue (Stover et al., 2013).

Data Analysis

Data were analyzed using SPSS Version 24 (IBM Corp., Armonk, NY). The sample was described using descriptive statistics (means, standard deviation, and frequency). To examine group differences between races (blacks and whites) and high versus low pain intensity in symptoms, χ^2 and independent sample t tests were used. Pearson product moment two-tailed correlations were used to examine correlations among symptoms.

Results

Sample Characteristics

A total of 40 women with stage I-III breast cancer participated in the study. The majority of women were diagnosed with stage II breast cancer, and 58% were black. The mean age of the sample was 58, and the majority received both radiation and chemotherapy. Half of the sample reported currently receiving hormonal therapy (Table 1).

Question 1: Prevalence of Symptoms of Pain, Sleep Disturbance, Anxiety, and Fatigue

A total of 31 women (78%) reported a sleep disturbance score greater than the normalized score of 50. The second most frequently experienced symptom above the normalized score was pain interference (N = 27, 68%), followed by anxiety (N = 25, 63%), with 15 women (38%) reporting a pain intensity greater than normalized score. There was a wide range of scores for pain intensity, pain interference, anxiety, and sleep disturbance, with the least variation in sleep disturbance (Table 2). The mean affective and sensory fatigue subscales indicated moderate cancer-related fatigue. The total and behaviors mean subscales were close to the cutoff point for moderate fatigue, whereas the cognitive subscale indicated mild fatigue (see Table 2). There were differences between black and white participants in the prevalence of symptoms. Two-sample independent t tests examined the differences between prevalence by race. Black participants reported a statistically significant higher pain intensity than white participants ($t = -2.696$, $df = 37$, $p = .01$). Black participants reported higher pain interference and anxiety and lower sleep disturbance and fatigue scores than white participants; however, these differences were not significantly different.

Question 2: Correlations among Symptoms of Pain, Sleep Disturbance, Anxiety, and Fatigue

Pearson product moment two-tailed correlations were used to examine the relations among the symptoms. With the exception of the correlation between pain intensity and sleep disturbance, all correlations were statistically significant as indicated in Table 3. There was a strong positive correlation between pain intensity and pain interference. The PFS-12 total score was highly correlated with all of the fatigue subscales. Pain intensity was moderately positively correlated with anxiety and fatigue. There were moderate correlations among symptoms of pain interference, sleep disturbance, anxiety, and fatigue. These findings suggest that these symptoms form a cluster and that women with higher distress on one symptom also experience distress in the other symptoms.

Table 1
Demographic and Clinical Characteristics of Participants (N = 40)

Characteristic	N	%
Age		
43-50	8	20
51-60	16	40
61-79	16	40
Race		
White	16	40
Black	23	57.5
Asian	1	2.5
BC Stage		
I	5	20
II	13	52
III	1	4
Unknown	5	20
Initial treatment		
Radiation	5	12.5
Chemotherapy	9	22.5
Radiation & chemotherapy	23	57.5
Unknown	3	7.5
Surgery type		
Mastectomy	16	40
Partial mastectomy	24	60
Hormone therapy		
Yes	21	52.5
No	19	47.5
Time since diagnosis		
6 months to <1 year	8	20
1 to <2 years	15	37.5
2 to <3 years	4	10
3 to <4 years	7	17.5
4 to 5 years	6	15

BC = breast cancer.

Question 3: Comparison of Symptoms between Low and High Pain Intensity Groups

The sample was divided into two pain intensity groups. The low pain intensity group (N = 25) reported pain equal to or less than the normalized score. The high pain intensity group (N = 15) reported pain greater than the normalized score. Of the high pain intensity group, 13 of the 15 women were black. A χ^2 analysis of race by pain intensity group revealed a significant difference between these groups ($\varphi = 0.459$, $p = .015$). A two-sample independent *t* test found statistically significant between group differences in symptoms. The high pain intensity group reported greater pain interference, more sleep disturbance, great anxiety, and more fatigue (Table 4).

Discussion

Based on the theory of unpleasant symptoms, our study sought to explore the prevalence and interactions of symptoms experienced by breast cancer survivors. Specifically, this study described the prevalence of three physical symptoms (pain, sleep disturbance, and fatigue) and one psychological symptom (anxiety) in breast cancer survivors; examined symptom differences between black and white participants; explored the relationships among pain intensity, pain interference, sleep disturbance, anxiety, and fatigue to confirm a symptom cluster; and examined symptom differences between survivors who experienced high and low levels of pain intensity.

This study added to the understanding of the symptom experience by reaffirming the symptom cluster (pain, sleep disturbance, anxiety, and fatigue) in a diverse sample of breast cancer survivors. Previous studies that examined pain and symptom clusters in breast cancer survivors had samples with 77%-97% white, urban participants (Befort & Kemp, 2011; Kroenke et al., 2013; Mao et al., 2014; Roiland & Heidrich, 2011). These previous findings may not be generalizable to minority populations or those who live in rural areas with fewer opportunities to access health care. This study sample included a larger percentage of black participants who are rural breast cancer survivors in eastern North Carolina and found that a higher proportion of black women experienced higher pain intensity that was associated with symptoms of fatigue, sleep disturbance, and anxiety. The study supports the need for further studies of the symptom experience of racially diverse samples of breast cancer survivors.

Breast cancer survivors may experience fatigue, sleep disturbance, anxiety, and pain up to 5 years after radiation and chemotherapy (Harrington et al., 2010). Aligning with this previous finding, normalized scores on the PROMIS measures in this study indicate the majority of breast cancer survivors report some symptoms. In this sample 78% reported sleep disturbance. Other symptoms of note in this study were pain interference and anxiety. Overall, women in this study experienced mild to moderate cancer-related fatigue. The prevalence of pain intensity reported in our study is within the previously reported range (Andersen & Kehlet, 2011; Bell et al., 2014; Green, Hart-Johnson, & Loeffler, 2011; Knobf, 2014; Laroche et al., 2014). The studied symptom cluster of pain, fatigue, sleep disturbance, and anxiety was also consistent with previous findings (Befort & Klemp, 2011; Given & Given, 2013; Lester et al., 2015).

The incidence of symptoms in the study sample was highly variable, as indicated by the wide range of normalized scores on the PROMIS measures and the raw Piper Total Fatigue and Piper Fatigue subscales. This variability suggests that recovery experiences, after primary treatment for breast cancer has concluded, will be unique to each survivor. Variability may be due to differences in curative treatment, receipt of hormonal therapy, side effect profile, or prior physical and psychiatric disorders or because women in our sample were at various stages of survivorship (Befort & Klemp, 2011; Bell et al., 2014; de Menezes Couceiro et al, 2014; Kim et al., 2014).

Table 2
Means, Standard Deviations and Range for Pain, Anxiety, Sleep Disturbance, and Fatigue (N = 40)

Symptom	White, N = 16	Black, N = 23	Total, N = 40	Range
	Mean (SD)	Mean (SD)	Mean (SD)	
Pain Intensity	38.8 (9.4)	49.5 (13.7)*	44.7 (13.2)	30.7-71.8
Pain Interference	51.9 (9.8)	56.6 (10.7)	54.3 (10.6)	41.1-76.2
Anxiety	49.0 (11.6)	51.6 (9.5)	50.6 (10.2)	36.3-82.4
Sleep Disturbance	55.0 (9.2)	52.7 (6.1)	53.9 (7.6)	37.7-74.4
Piper Fatigue Total Score	4.0 (2.6)	3.5 (3.1)	3.7 (2.8)	0-9.75
Piper Fatigue Cognitive Subscale	3.6 (2.8)	3.8 (2.8)	3.0 (3.0)	0-10
Piper Fatigue Affective Subscale	4.4 (2.9)	3.8 (3.4)	4.1 (3.2)	0-10
Piper Fatigue Sensory Subscale	4.4 (2.4)	3.6 (3.3)	4.0 (3.0)	0-10
Piper Fatigue Behavioral Subscale	3.8 (3.2)	3.5 (3.1)	3.9 (3.3)	0-10

SD = standard deviation.
* $p = .01$.

Table 3
Intercorrelations for Symptoms Experienced by Breast Cancer Survivors

Variable	1	2	3	4	5	6	7	8	9
1. Pain Intensity	—								
2. Pain Interference	0.89*	—							
3. Sleep Disturbance	0.29	0.50*	—						
4. Anxiety	0.44*	0.53*	0.58*	—					
5. Piper Total Fatigue	0.58*	0.58*	0.49*	0.59*	—				
6. Piper Cognitive Fatigue subscale	0.51*	0.49*	0.35*	0.56*	0.90*	—			
7. Piper Sensory Fatigue subscale	0.48*	0.47*	0.45*	0.54*	0.91*	0.78*	—		
8. Piper Affective Fatigue subscale	0.58*	0.61*	0.54*	0.53*	0.93*	0.75*	0.82*	—	
9. Piper Behavioral Fatigue subscale	0.55*	0.56*	0.48*	0.52*	0.91*	0.76*	0.74*	0.82*	—

* Correlation is significant at the 0.01 level (2-tailed).

The present results for this sample reveal that pain intensity and pain interference are highly correlated. Women who experience higher levels of pain intensity reported higher levels of pain interference in their day to day lives. The strong correlation between pain intensity and pain interference suggests that women with inadequately managed pain have more difficulty managing basic activities (Harrington et al., 2010). This finding is concerning for survivors because there are fewer opportunities to assess for pain and adjust pain management strategies as the women progress further from treatment. Women who live in rural settings may schedule even fewer follow-up visits because of difficulty with access or distance to follow-up appointments (Befort & Klemp, 2011). This finding is concerning in our small rural-dwelling sample and because black women in this study were more likely to report higher pain intensity. Given the documented race-related disparity in pain management during cancer treatment (Meghani et al., 2012, 2014), this finding suggests a need to further investigate health disparities in pain and symptom management during the survivorship phase of care.

Furthermore, results indicate the symptoms of pain, sleep disturbance, fatigue, and anxiety were significantly and moderately correlated with one another. The correlation among symptoms suggests that breast cancer survivors who experience one of these distressing symptoms are likely to experience co-occurring symptoms. The previously identified symptom cluster has been examined in some survivors but not specifically examined in minority populations (Befort & Klemp, 2011; Given & Given, 2013; Lester et al., 2015). The confirmation of this symptom cluster in this population provides support for the theory of unpleasant symptoms, which postulates that symptoms are experienced together rather than individually. However, additional studies with diverse samples are needed.

Breast cancer survivors with higher pain intensity scores may have a different symptom experience than those with lower pain intensity scores. Differences in symptoms were examined between breast cancer survivors who reported pain intensity scores greater than and less than the normalized PROMIS score of 50. A significant difference between groups was found for all symptoms, the Piper Total Fatigue scale, and all Piper Fatigue subscales. Breast cancer survivors who experience unmanaged pain report a higher incidence of distressing symptoms, including difficulty sleeping, fatigue, and feelings of anxiety (Green et al., 2011). These results suggest that management of pain intensity is an important factor to the overall symptom experience and that women who report high levels of pain may be at an increased risk to experience other symptoms (Baker et al., 2014; Green et al., 2011). The influence of pain intensity on the overall symptom experience should be systematically investigated in future studies with larger samples.

Limitations

First, this study was conducted with a small convenience sample and may not be representative of all breast cancer survivors, and participants were only asked about selected symptoms. More research is needed to determine if the results are applicable to racially diverse rural and urban populations and what other symptoms may be prevalent among breast cancer patients. The women in our sample concluded treatment 6 months to 5 years ago, and approximately half were currently receiving hormonal therapy during the study. Second, the majority of the women in the study were diagnosed with stage II disease and results may not be applicable to women diagnosed with metastatic disease. Finally, with this small descriptive convenience sample, it is not possible to infer direction or relationships among symptoms and demographic characteristics.

Implications for Nursing Research

Understanding pain and symptom clusters is an important issue for breast cancer survivors. During the survivorship phase of care, assessing for pain and symptom clusters at every visit is necessary as clinic visits become more infrequent over time. Because the

Table 4
Group Differences for Pain Intensity (Less Than and Greater Than Normalized Score of 50) in Symptoms of Pain Interference, Sleep Disturbance, Anxiety, and Fatigue

Variable	Pain Intensity ≤50, N = 25		Pain Intensity ≥50.1, N = 15		*t*	*df*	*p*	Cohen's d
	M	SD	M	SD				
Pain Interference	47.8	7.2	65.2	4.6	9.30	38	.00	2.87
Sleep Disturbance	51.6	7.2	57.8	6.8	2.75	38	.01	0.89
Anxiety	46.2	7.8	57.9	9.7	4.02	38	.00	1.34
Fatigue (Total)	2.5	1.9	5.8	2.9	4.27	38	.01	1.35
Cognitive subscale	2.0	2.3	4.8	3.4	2.82	38	.01	0.95
Behavioral subscale	2.3	2.2	6.6	3.0	4.72	38	.00	1.61
Affective subscale	2.6	2.4	6.5	2.9	4.38	38	.00	1.46
Sensory subscale	3.1	2.3	5.5	3.4	2.35	38	.28	0.82

M = mean; SD = standard deviation.

number of breast cancer survivors continues to increase, identifying and intervening to reduce pain and other common symptoms is imperative to improve the overall survivorship experience. Pain and symptom cluster results in our study are similar to previous studies (Harrington et al., 2010; So et al., 2009) and support the notion that these are ongoing problems after chemotherapy and radiation treatments end.

Implications for Nursing Practice

Traditional nursing assessments only address pain as a unidimensional symptom: pain intensity. These findings suggest a need to assess additional dimensions of the pain experience, including patterns, location, character, and aggravating and ameliorating factors. These additional dimensions provide the clinicians with data to select appropriate treatments, and better treatment of pain may improve other symptoms such as anxiety, sleep disturbance, and fatigue. Clinicians must improve efforts to assess the multidimensional pain experience, particularly in minority patients for whom documented pain management disparities exist. A multidimensional approach to pain assessment is especially important for breast cancer survivors as clinic visits continue to decrease over time and there are fewer opportunities for assessment. Additionally, clinicians who assess for pain should be cognizant that breast cancer survivors who experience high pain intensity should be carefully assessed for the co-occurring symptoms discussed in this study.

Future research should continue to assess the role of pain intensity on the experience of other common symptoms associated with breast cancer survival. This study should be expanded to a larger population with a primarily African-American and rural sample to determine if survivors of breast cancer experience symptom cluster health-related disparities associated with race or access to services after treatment.

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