

2000; Stevens, Dibble, & Miaskowski, 1995; Woo, Dibble, Piper, Keating, & Weiss, 1998). These symptoms may be associated with side effects of breast cancer surgery, chemotherapy, or radiation therapy. Little is known, however, about racial and ethnic differences in post-treatment symptoms among breast cancer survivors. Therefore, the purpose of this study was to examine breast cancer treatment and post-treatment symptoms among women of different ethnic groups.

ACS has identified racial and socioeconomic disparities in access to breast cancer detection and treatment as critical areas for intervention (Shinagawa, 2000). More advanced stage of disease at diagnosis has been documented among ethnic minority (African American and Latina) and low-income women (Bentley, Delfino, Taylor, Howe, & Anton-Culver, 1998; Boyer-Chamard, Taylor, & Anton-Culver, 1999). In addition to increased risk for mortality, more advanced disease may account for an increased number of ethnic minority women who receive mastectomies or adjuvant therapies such as chemotherapy or radiation. More advanced disease and more radical treatment may lead to an increased risk for treatment-induced symptoms.

Depression

Although a wide range of rates is reported because of varying degrees in sensitivity of the measures used, depression has been estimated in as many as 57% of patients with breast cancer (Badger, Braden, & Mishel, 2001; Morasso et al., 2001). Women who have a history of trauma are at especially high risk for becoming more severely depressed after breast cancer diagnosis (Green et al., 2000). Depression at breast cancer diagnosis has been associated with younger age (Compas et al., 1999) and late-stage diagnoses (Desai, Bruce, & Kasl, 1999). Walker et al. (1999) demonstrated that psychological factors such as depression are independent prognostic factors of survival among breast cancer survivors undergoing chemotherapy, regardless of size of tumor at diagnosis.

Pain

A large number of patients with breast cancer experiences postsurgical pain at the site of incision (Smith, Bourne, Squair, Phillips, & Chambers, 1999). Postsurgical pain is a chronic neuropathic pain syndrome that manifests in electric shock-like pain, shooting or burning pain, and altered skin sensation prevalent after radical mastectomy, modified radical mastectomy, and lumpectomy (Stevens et al., 1995). Estimates of prevalence range from 20%–27%. Pain also occurs in women who develop lymphedema, an accumulation of protein-rich fluid in soft tissue secondary to interruption of flow of lymphatic fluids. Lymphedema most commonly is found in the extremities but also may occur in the head, neck, abdomen, lungs, and genitals (Loudon & Petrek, 2000). Lymphedema, which generally is progressive, can go from a barely noticeable inflammation to severe impairment of a limb. Lymphedema is estimated to affect as many as 56% of breast cancer survivors and is believed to result from surgical resection of lymphatic vessels and nodes, fibrosis induced by infection, or radiation or surgery around these structures (Erickson, Pearson, Ganz, Adams, & Kahn, 2001).

Fatigue

Fatigue has been cited as the most prevalent and persistent of difficulties and affects up to 75% of cancer survivors (Broeckel,

Jacobson, Horton, Balducci, & Lyman, 1998; Okuyama et al., 2000; Woo et al., 1998). Fatigue is a commonly occurring side effect of chemotherapy (Groopman & Itri, 1999; Jacobsen et al., 1999; Richardson, 1995). Moreover, fatigue is associated with the development of other chemotherapy side effects such as nausea and mouth sores (Jacobsen et al.).

Purpose

The purpose of this study was to examine the relationship among surgical treatments, adjuvant therapies, and post-treatment symptoms in a multiethnic (Caucasian, African American, and Latina) sample of breast cancer survivors. Specific questions included “What are the proportions of women reporting symptoms in each ethnic group?” and “What are the independent associates of reporting multiple symptoms?”

Methods

A descriptive survey was designed collaboratively between two community-based organizations and university-based researchers to examine what appeared to be disproportionate suffering of post-treatment symptoms among the ethnic minority breast cancer survivors seeking social services from these community-based organizations.

Design and Sample

Inclusion criteria for this descriptive study were adult women aged 18–60 years who were diagnosed and treated for breast cancer during the past two years, working at least 20 hours weekly at the time of their diagnosis, able to give informed consent, and able to speak either English or Spanish.

Settings

The collaborating agencies included a program that offers advocacy and practical support to women living with cancer and a program to assist patients with cancer attending public hospitals to obtain and adhere to follow-up care. Both programs are located in an urban area in northern California.

Procedures

Participants responded to posted flyers by calling the study coordinator. After receiving informed consent, eligible participants were surveyed using a face-to-face interviewer-administered instrument in Spanish or English that lasted 45–90 minutes. Interviewers estimated the refusal rate to be approximately 15%.

Instruments

Study measures included demographics; disease severity; surgical treatment; post-treatment symptoms measured by the **Piper Fatigue Scale** (Piper et al., 1998), the **Brief Pain Inventory (BPI)** (Cleeland, Gonin, Baez, Loehrer, & Pandya, 1997), and the **Center for Epidemiologic Studies–Depression (CES-D) Scale** (Radloff, 1977); and lymphedema-related swelling using a single item on a 1–10 scale. Scale validity had been tested and established in patients with cancer for the Piper Fatigue Scale (Piper et al.), the BPI (Tittle, McMillan, & Hagan, 2003) and the CES-D (Hann, Winter, & Jacobsen, 1999).

The full-scale internal consistency (Cronbach’s alpha) for each of the standardized scales ranged from 0.87–0.97, demonstrating good to excellent scale integrity for the study population. Within ethnic groups, less satisfactory results were

found in the pain score and pain interference scores for the Latinas (0.84) and the cognitive or mood scores on the Piper Fatigue Scale for Caucasians (0.79).

Data Analyses

Data were checked, cleaned, entered, and analyzed using SPSS® version 11.0 (SPSS Inc., Chicago, IL) by the study team. Proportions of disease, treatment, and symptom variables were calculated for each ethnic group and compared by chi-square. Mean symptom scores were calculated and compared using analysis of variance. The independent correlates of total number of symptoms were calculated using least-squares regression.

Results

The mean age of the women ($N = 116$) who participated in this pilot survey was 47 years (range = 29–68). Thirty percent were Caucasian, 30% African American, 25% Latina, and 15% were of other ethnic backgrounds (3 Asians or Pacific Islanders, 14 women who reported mixed-race heritage, and 2 whose ethnicity was not indicated). Thirty-three percent were currently married, and 12% were lesbian or bisexual. The mean years of education was 12 (range = 0–19). The current mean monthly net income was \$1,236 (range = \$0–\$3,500). Latinas, African Americans, and women of other ethnic backgrounds reported lower incomes compared to Caucasians ($p \leq 0.001$). Latinas reported the lowest mean years of education, followed by women of other ethnic backgrounds, African Americans, and Caucasians ($p \leq 0.01$). Caucasians, women of other ethnic backgrounds, and Latinas were more likely to report being currently married compared to African Americans ($p \leq 0.01$). Caucasians were more likely to report being lesbian or bisexual than African Americans, Latinas, and women of other ethnic backgrounds ($p \leq 0.05$). Caucasians also were more likely to report having health insurance and to report being diagnosed with stage I breast cancer compared to African Americans, Latinas, and women of other ethnic backgrounds ($p \leq 0.01$). Latinas were more likely to not know their breast cancer stage compared to African Americans and Caucasians ($p \leq 0.01$). African Americans and Latinas were more likely to report having a mastectomy compared to Caucasians and women of other ethnic backgrounds ($p \leq 0.01$). Latinas also were more likely to report receiving chemotherapy ($p \leq 0.01$) (see Table 1).

Eighty-four percent of the women reported that they currently suffer from at least one post-treatment symptom. This included 79% with pain, 37% with fatigue, 52% with levels of depressive symptomatology sufficient to be considered clinically depressed (i.e., CES-D score ≥ 16), and 63% with moderate to severe swelling from lymphedema. Latinas reported significantly higher rates of fatigue ($p \leq 0.001$) and higher rates of depression ($p \leq 0.001$). African Americans and Latinas were more likely to report pain. African Americans, Latinas, and the other women were more likely to report swelling (lymphedema) than Caucasians ($p \leq 0.001$).

Ethnicity, education, income, being insured, stage of disease, mastectomy, and chemotherapy were entered into a least-squares regression model to examine independent predictors of number of symptoms. Lower income ($p \leq 0.01$), having a mastectomy ($p \leq 0.01$), receiving chemotherapy ($p \leq 0.05$), and being Latina ($p \leq 0.01$) were significantly associated with an increased number of symptoms. No other independent significant

relationships existed among demographic, disease or treatment variables, and number of symptoms (see Table 2).

Discussion

This is the first study designed to explore breast cancer-related post-treatment difficulties by ethnicity. African American women and Latinas reported significantly higher rates of pain and lymphedema. Latinas reported significantly higher rates of depression and fatigue. Post-treatment symptoms have not been explored extensively among minority patients with breast cancer, and these results suggest that substantive ethnic differences exist.

Latinas reported almost twice the rate of depressive symptoms as African Americans and Caucasians. African Americans and Latinas reported higher rates of pain than Caucasians. Reporting lower income, having a mastectomy, having chemotherapy, and being Latina were significant predictors of reporting an increased number of symptoms. This suggests that social and economic factors may play a major role in women being able to access post-treatment rehabilitative care. Although the relationship between social and demographic factors and post-treatment symptoms has not been explored extensively, increased income has been associated with improved quality of life among African American and Caucasian breast cancer survivors (Ashing-Giwa, Ganz, & Petersen, 1999).

These data also suggest that Latina breast cancer survivors are at very high risk for depression and may be in need of targeted psychological support and therapeutic interventions. A possible reason for increased reporting of depression and fatigue among Latinas is an increased rate of receiving chemotherapy. Previous research has shown that depression also has been associated with fatigue and that depression and increased fatigue have been associated with chemotherapy (Jacobsen et al., 1999; Okuyama et al., 2000). Additional factors contributing to depression among Latinas may include low income, decreased access to services, difficulty with finding culturally sensitive services, gender roles, and difficulties with immigration (Amaro & Felipe-Russo, 1987).

Reasons for increased rates of pain among African Americans and Latinas may include more radical treatments (especially increased rates of mastectomy) as a consequence of being diagnosed with more advanced disease and possible disparities in treatment options. Additionally, considerable attention has been given to ethnic and gender disparities in disease screening after pain complaints, interventions offered, and types of pain medications prescribed (Cleeland et al., 1997; MacDonald, 1993; Todd, Deaton, D'Adamo, & Goe, 2000).

Limitations

This study has a number of limitations. A retrospective self-report survey makes attributing causality difficult. The volunteer sample of breast cancer survivors who are enrolled in services at a cancer advocacy or support organization may contribute to a bias toward women who are having more difficulty adapting to cancer or cancer treatment. The psychometrics of the scales, although generally acceptable, are not even across ethnic groups, and the small sample size makes for limited interpretability and generalizability. Finally, this sample was collected in an urban area in northern California, from women who were enrolled in ongoing health care, and may not be representative of a national sample of multiethnic breast cancer survivors.

Table 1. Sample Description

Variable	Caucasians	African Americans	Latinas	Others	All
Age (years)					
\bar{X}	46	49	46	49	47
Range	29–62	33–65	29–67	36–68	29–68
Education (years)					
\bar{X}	14	12**	10	11	12
Range	8–19	8–19	3–19	0–18	0–19
Monthly income (\$)					
\bar{X}	1,441	1,120	1,119	758	1,236***
Range	0–2,700	321–3,058	0–3,500	0–2,200	0–3,500
Currently married (%)					
	42	–	61	65	33**
Any children (%)					
	63	71	93	35	74
Sexual orientation (%)					
Heterosexual	63	92	100	94	88
Lesbian or bisexual	27	8	–	6	12*
Employment status (%)					
Full-time	56	23	39	23	34
Part-time	22	37	36	35	32
Unemployed	14	20	21	29	20
Health insurance (%)					
	53	14	29	18	32*
Disease stage (%)					
I	66	29	23	38	41
II	20	29	45	25	29
III	11	40	23	38	25
IV	3	3	9	–	4**
Disease stage unknown (%)					
	3	–	21	6	7**
Breast cancer procedure (%)					
Lumpectomy	72	44	43	53	44**
Mastectomy	27	66	57	25	56**
Radiation	92	88	88	38	88
Chemotherapy	41	47	89	–	58**
Postsurgical symptoms					
Number of symptoms (\bar{X})	1.2	1.5	2.5	1.1	1.7**
Fatigue (%)	22	27	68	40	37**
Pain (%)	54	91	93	65	79***
Swelling (lymphedema) (%)	39	77	75	71	63***
Clinically depressed (%)	40	38	89	47	52***
CES-D score (\bar{X})	13.5	14.2	28.3	17.5	18.0***
CES-D score (range)	1–34	1–30	9–53	2–46	1–53

N = 116

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

CES-D—Center for Epidemiologic Studies–Depression Scale

Note. Missing data exist for some variables. Because of rounding, percentages may not total 100.

Strengths of the study include a developing expertise in recruitment of a multiethnic sample of breast cancer survivors. In addition, this experience of melding the community with university-based research was a successful endeavor.

Table 2. Correlates of Total Number of Symptoms—Least Squares Model

Independent Predictors	Beta	p
Income	–0.397	0.003
Mastectomy	0.340	0.005
Chemotherapy	0.340	0.026
Latina	0.340	0.004

Adjusted $R^2 = 0.37$

Conclusions

Data from this survey suggest that, in addition to being associated with breast cancer treatments, post-treatment symptoms may be associated with sociodemographic factors such as ethnicity and income. In the past, social disparities in breast cancer screening and treatment have been associated with decreased chances for survival. These data suggest that social disparities in symptoms also may be associated with disparities in functioning and quality of life. These disparities among breast cancer survivors may result from lack of information regarding therapeutic interventions, inability to afford rehabilitative therapies, language barriers, or lack of information on how to communicate effectively with providers.

Implications for Nursing

Pharmacologic, self-help, and complementary therapy interventions to reduce the impact of post-treatment symptoms are becoming more widespread. These findings suggest a need for these strategies to be affordable and linguistically and culturally

appropriate to address the needs of a wider and ethnically inclusive group of breast cancer survivors. Nursing will have a vital role in designing, testing, and offering such interventions.

Author Contact: Rani Eversley, PhD, can be reached at devers@itsa.ucsf.edu, with copy to editor at rose_mary@earthlink.net.

References

- Amaro, H., & Felipe-Russo, N. (1987). Hispanic women and mental health: An overview of contemporary issues in research and practice. *Psychology of Women Quarterly*, 4, 393–407.
- American Cancer Society. (2004). *Breast cancer facts and figures 2003–2004*. Atlanta, GA: Author.
- American Cancer Society. (2005). *Cancer facts and figures 2005*. Atlanta, GA: Author.
- Ashing-Giwa, K., Ganz, P.A., & Petersen, L. (1999). Quality of life of African-American and white long term breast carcinoma survivors. *Cancer*, 85, 418–426.
- Badger, T.A., Braden, C.J., & Mishel, M.H. (2001). Depression burden, self-help interventions, and side effect experience in women receiving treatment for breast cancer. *Oncology Nursing Forum*, 28, 567–574.
- Bentley, J.R., Delfino, R.J., Taylor, T.H., Howe, S., & Anton-Culver, H. (1998). Differences in breast cancer stage at diagnosis between non-Hispanic white and Hispanic populations, San Diego County 1988–1993. *Breast Cancer Research and Treatment*, 50, 1–9.
- Boyer-Chammard, A., Taylor, T.H., & Anton-Culver, H. (1999). Survival differences in breast cancer among racial/ethnic groups: A population-based study. *Cancer Detection and Prevention*, 23, 463–473.
- Broeckel, J.A., Jacobson, P.B., Horton, J., Balducci, L., & Lyman, G.H. (1998). Characteristics and correlates of fatigue after adjuvant chemotherapy for breast cancer. *Journal of Clinical Oncology*, 16, 1689–1696.
- Carpenter, J.S., Sloan, P., Andrykowski, M.A., McGrath, P., Sloan, D., Rexford, T., et al. (1999). Risk factors for pain after mastectomy/lumpectomy. *Cancer Practice*, 7, 66–70.
- Cleeland, C.S., Gonin, R., Baez, L., Loehrer, P., & Pandya, K.J. (1997). Pain and treatment of pain in minority patients with cancer. The Eastern Cooperative Oncology Group Minority Outpatient Pain Study. *Annals of Internal Medicine*, 127, 813–816.
- Compas, B.E., Stoll, M.F., Thomsen, A.H., Oppedisano, G., Epping-Jordan, J.E., & Krag, D.N. (1999). Adjustment to breast cancer: Age-related differences in coping and emotional distress. *Breast Cancer Research and Treatment*, 54, 195–203.
- Desai, M.M., Bruce, M.L., & Kasl, S.V. (1999). The effects of major depression and phobia on stage at diagnosis of breast cancer. *International Journal of Psychiatry in Medicine*, 29, 29–45.
- Erickson, V.S., Pearson, M.L., Ganz, P.A., Adams, J., & Kahn, K.L. (2001). Arm edema in breast cancer patients. *Journal of the National Cancer Institute*, 93, 96–111.
- Green, B.L., Krupnick, J.L., Rowland, J.H., Epstein, S.A., Stockton, P., Spertus, I., et al. (2000). Trauma history as a predictor of psychologic symptoms in women with breast cancer. *Journal of Clinical Oncology*, 18, 1084–1093.
- Groopman, J.E., & Itri, L.M. (1999). Chemotherapy-induced anemia in adults: Incidence and treatment. *Journal of the National Cancer Institute*, 91, 1616–1634.
- Hann, D., Winter, K., & Jacobsen, P. (1999). Measurement of depressive symptoms in cancer patients: Evaluation of the Center for Epidemiologic Studies Depression Scale (CES-D). *Journal of Psychosomatic Research*, 46, 437–443.
- Jacobsen, P.B., Hann, D.M., Azzarello, L.M., Horton, J., Balducci, L., & Lyman, G.H. (1999). Fatigue in women receiving adjuvant chemotherapy for breast cancer: Characteristics, course, and correlates. *Journal of Pain and Symptom Management*, 18, 233–242.
- Kakuda, J.T., Stuntz, M., Trivedi, V., Klein, S.R., & Vargas, H.I. (1999). Objective assessment of axillary morbidity in breast cancer treatment. *American Surgeon*, 65, 995–998.
- Loudon, L., & Petrek, J. (2000). Lymphedema in women treated for breast cancer. *Cancer Practice*, 8, 65–71.
- MacDonald, N. (1993). Educational programs in pain and palliative care. *Journal of Pain and Symptom Management*, 8, 348–352.
- Morasso, G., Costantini, M., Viterbori, P., Bonci, F., Del Mastro, L., Musso, M., et al. (2001). Predicting mood disorders in breast cancer patients. *European Journal of Cancer*, 37, 216–223.
- Okuyama, T., Akechi, T., Kugaya, A., Okamura, H., Imoto, S., Nakano, T., et al. (2000). Factors correlated with fatigue in disease-free breast cancer patients: Application of the Cancer Fatigue Scale. *Supportive Care in Cancer*, 8, 215–222.
- Overgard, M. (2000). Evaluation of radiotherapy in high-risk breast cancer patients given adjuvant systemic therapy. *Rays*, 25, 325–330.
- Piper, B.F., Dibble, S.L., Dodd, M.J., Weiss, M.C., Slaughter, R.E., & Paul, S.M. (1998). The revised Piper Fatigue Scale: Psychometric evaluation in women with breast cancer. *Oncology Nursing Forum*, 25, 677–684.
- Radloff, L.S. (1977). The CES-D Scale: A self report depression scale for research in the general population. *Applied Psychological Measurement*, 1, 385–401.
- Richardson, A. (1995). Fatigue in cancer patients: A review of the literature. *European Journal of Cancer Care*, 4, 20–32.
- Shank, B., Moughan, J., Owen, J., Wilson, F., & Hanks, G.E. (2000). The 1993–94 patterns of care process survey for breast irradiation after breast-conserving surgery—Comparison with the 1992 standard for breast conservation treatment. *International Journal of Radiation Oncology, Biology, Physics*, 48, 1291–1299.
- Shinagawa, S.M. (2000). The excess burden of breast carcinoma in minority and medically underserved communities: Application, research, and redressing institutional racism. *Cancer*, 88(5, Suppl.), 1217–1223.
- Smith, W., Bourne, D., Squair, J., Phillips, D., & Chambers, W. (1999). A retrospective cohort study of post mastectomy pain syndrome. *Pain*, 83, 91–95.
- Stevens, P., Dibble, S.L., & Miakowski, C. (1995). Prevalence, characteristics and impact of post-mastectomy pain syndrome: An investigation of women's experience. *Pain*, 61, 61–68.
- Tittle, M.B., McMillan, S.C., & Hagan, S. (2003). Validating the Brief Pain Inventory for use with surgical patients with cancer. *Oncology Nursing Forum*, 30, 325–330.
- Todd, K.H., Deaton, C., D'Adamo, A.P., & Goe, L. (2000). Ethnicity and analgesic practice. *Annals of Emergency Medicine*, 35, 11–16.
- Walker, L.G., Heys, S.D., Walker, M.B., Ogston, K., Miller, I.D., Hutcheon, A.W., et al. (1999). Psychological factors can predict the response to primary chemotherapy in patients with locally advanced breast cancer. *European Journal of Cancer*, 35, 1783–1788.
- Woo, B., Dibble, S.L., Piper, B.F., Keating, S.B., & Weiss, M.C. (1998). Differences in fatigue by treatment methods with breast cancer. *Oncology Nursing Forum*, 25, 915–920.

The continuing education examination and test form for the preceding article appear on the following pages.