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Nueva Luz: Impact of a bilingual education intervention on the Quality of Life of Latina Breast Cancer Survivors

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Breast cancer disproportionately affects Latina women living in the United States (US) and is the primary cause of cancer related deaths in this population. (Siegel, Naishadham, & Jemal, 2012). Compared to non-Latina Whites, Latinas are diagnosed with less favorable prognosis, at a younger age, higher grade, larger tumors, later stage, ER-and triple negative tumors and have a lower survival rate (Wu et al., 2012). The 5-year survivorship rate is 83.3 % for Latinas compared to 88.8% for non-Latina Whites (DeSantis, Siegel, Bandi, & Jemal, 2011). Important ethnic variations exist as to the type of treatment Latina and other ethnic minorities receive including an increased risk for treatment delays, access to care and lower quality of care (Freedman, He, Winer, & Keating, 2009; Parise, Bauer, & Caggiano, 2012). These differences in treatment have important potential negative effects on QOL. Despite some beginning studies in this area, intervention testing addressing physical, psychological, social and spiritual aspects of QOL in Latina breast cancer survivors has not occurred (Ashing-Giwa & Lim, 2009; Ashing-Giwa, Rosales, Lai, & Weitzel, 2012; Ashing-Giwa, Padilla, Bohorquez, Tejero, & Garcia, 2006; Bowen et al., 2007; Eversley et al., 2005; Lim, Gonzalez, Wang-Letzkus, & Ashing-Giwa, 2009; Lopez-Class, Gomez-Duarte, Graves, & Ashing-Giwa, 2012; Lopez-Class, Perret-Gentil, et al., 2011; Paskett et al., 2008; Sammarco, 2009; Sammarco & Konecny, 2008; Wildes, Miller, Majors, & Ramirez, 2009).

In 2011, there were more than 2.6 million breast cancer survivors in the US (DeSantis et al., 2011). Improving the QOL of cancer survivors has been identified as a public health priority by the Institute of Medicine (IOM) report, “From Cancer Patient to Cancer Survivor: Lost in Transition,” and numerous other organizations. A recent IOM report also highlighted the need to evaluate QOL during the key period following the end of initial diagnosis and treatment (Hewitt, Greenfield, & Stovall, 2006). Latinos are currently the largest and the fastest-growing ethnic minority group in the United States (Pew Hispanic Center, 2010). Thus as the Latino population continues to grow, so will the cohort of Latina breast cancer survivors living with the consequences of cancer and cancer related treatment. Although there is a large body of research addressing breast cancer QOL, relatively few studies have focused on the post-treatment experience of Latina breast cancer survivors.

The Latino population does not have access to the same quality of care as mainstream America. Lack of access to care can be influenced by many factors including insurance status, linguistic isolation, low education, insufficient information, language barriers, immigration status, racism, acculturation, lack of understanding of the US health care system and scarcity of ethnically and culturally sensitive health care facilities (Bradley, Given, & Roberts, 2002; Guidry, Torrence, & Heberin, 2005). Even with the largest rate of labor force participation of all ethnic groups, Latinos are the poorest minority group and have the highest uninsured rate among all ethnic groups (Pew Hispanic Center, 2010).

Acculturation levels have been shown to be associated with positive and negative health behaviors and outcomes among Latinos (Arcia, Skinner, Bailey, & Correa, 2001). While language skills improve, health living behaviors may decrease. Length of time living in the United States and acculturation are considered to be potential stressors due to problems with language, isolation from support systems, and fewer social ties. Studies have documented that as acculturation increases, traditional values toward family support decreased (Insaf, Jurkowski, & Alomar, 2010). These factors then contribute to increased psychological distress. Some risk factors for psychological distress associated with breast cancer among women of Mexican ancestry vary according to their level of acculturation. Level of acculturation is also influenced by various factors including age, place of residence, employment and social networks (Thomson & Hoffman-Goetz, 2009).

This literature review reveals a lack of studies of Hispanic breast cancer survivors and a need to test a culturally congruent intervention. The purpose of this pilot study was to test the effectiveness of an English/Spanish education intervention to assist Latina breast cancer survivors transition into survivorship. *Nueva Luz* (New Light) is a bilingual breast cancer educational intervention designed to improve the quality of life (QOL) of Latina breast cancer survivors after completing primary treatment.

Conceptual Framework

The conceptual framework guiding this research was the model of QOL in cancer survivorship. Overall QOL is defined as a personal sense of well being encompassing physical, psychological, social, and spiritual dimensions (Dow, Ferrell, Leigh, Ly, & Gulasekaram, 1996; Ferrell, Dow, Leigh, & Gulasekaram, 1995). QOL is a subjective experience that is influenced by culture and life experiences (Kagawa-Singer, Padilla, & Ashing-Giwa, 2010). This study focused on QOL in post-treatment survivorship.

Methods

Sample and Setting

Eligibility criteria included English and Spanish speaking Latinas 18 years of age or older with a histologically confirmed diagnosis of stage I, II, or III breast cancer, completing primary treatment with surgery, radiation therapy (if indicated), and neoadjuvant or adjuvant chemotherapy (if indicated) and may be receiving adjuvant hormonal therapy such as tamoxifen during the course of the study since it is recommended for five years after primary and adjuvant therapy. Study participants were recruited from the medical oncology adult ambulatory care clinics at a NCI-designated comprehensive cancer center. The study sample consisted of 52 Latina breast cancer survivors meeting the inclusion criteria. Thirty-two experimental and 18 control patients were available for testing at all three time periods for most of these outcome variables (two experimental patients having been lost to follow-up at time 3). Of the 164 accessible breast cancer survivors screened, 68 were ineligible (cancer stage, metastasis, recurrence, long-term survivors), 17 (22%) decline the study for reasons such as too busy, were going back to live or visit their country of origin (Mexico,

Central or South America) no interest, or competing demands on their time and 52 completed the questionnaires.

Design

A two-group, prospective longitudinal randomized controlled trial was used for this pilot project. Patients were randomly assigned to the experimental or to the attention control group. The attention control condition involved usual care plus monthly telephone calls provided to patients. Usual care may include support from the patient's healthcare team as well as services provided through the cancer center. Patient resources currently available in this setting include supportive care services, monthly educational workshops, support groups, access to a cancer information resource nurse, and access to written materials through a patient and family resource center. Patients assigned to the experimental arm received the intervention in their chosen language (English or Spanish).

Procedures

The study was reviewed and approved by the City of Hope Institutional Review Board, in Duarte, CA. The patient's physician introduced the overall purpose of the study and solicited permission from potential patients to meet with the principal investigator who was responsible for all aspects of study procedures, including subject accrual, intervention implementation and follow-up. The principal investigator approached all individuals meeting the eligibility criteria during a regularly scheduled clinic visit. Once eligibility was determined, the study purpose and procedures were introduced. Written informed consent was obtained in the chosen language (English or Spanish) of all the subjects prior to enrollment.

Subjects randomized to the attention control group received initial face-to-face baseline assessment and completed questionnaires at baseline, 3 months and 6 months. They also received monthly telephone follow-up by the principal investigator. These phone calls were designed for retention purposes only. At the end of the 6-month study period, patients randomized to the attention control group were offered the education intervention delivered over 2 face-to-face sessions and bilingual printed teaching materials were provided.

For subjects in the experiment group, the bilingual, bicultural principal investigator delivered the first session at week 1 after accrual, randomization, baseline data collection and evaluation of participant's needs. The subsequent intervention sessions were scheduled weekly, with all four teaching sessions completed at approximately 1 month post accrual. Length of the intervention was tailored to the patient's needs and was approximately 40- 60 minutes in length. The sessions were delivered in English or Spanish, tailored to the language preference of the subjects. In addition to the intervention, participants received a bilingual education packet in a notebook format. Upon completion of the four sessions, monthly support through telephone-follow-up sessions was provided by the principal investigator. Outcomes were collected at baseline and repeated at 3 and 6 months post intervention.

The Intervention- Nueva Luz

Nueva Luz is an individualized, multidimensional bilingual (English/Spanish) QOL program designed to provide Latinas with breast cancer with structured information that was linguistically and culturally appropriate about high incidence QOL concerns and strategies to assist women transition into the survivorship period. The intervention content was organized using the conceptual model around the QOL domains of physical, psychological, social, and spiritual well-being specific to breast cancer. Cultural and linguistic factors were considered in the design and delivery of *Nueva Luz*. This includes providing the

intervention in the preferred language and allowing family members to be present. Session 1 focused on Physical Well-Being and the management of physical symptoms such as pain, fatigue and lymphedema. For session 2 the focus was on Psychological Well-Being (fear of recurrence, anxiety). Session 3 focused on Social Well-Being and teaching content included sexuality/intimacy, family needs and communication. Session 4 was devoted to Spiritual Well-Being and also included a brief summary of the 4 sessions.

Outcome Measures

All the measures used in this study were available in English and Spanish. *The Demographic and Treatment Data* questionnaire was developed to capture key disease and treatment variables of importance in describing the population. Demographic and treatment data such as age, country of birth, education level, stage of disease, treatments, and use of complimentary therapies were collected at baseline. All questionnaires were given in person at the time of regular clinical follow-up or were mailed with a self-addressed stamped return envelope.

Acculturation was measured using the Short Acculturation Scale (SAS) (Marin, Sabogal, Marin, Otero-Sabogal, & Perez-Stable, 1987). The SAS is an eight-item language scale with good internal reliability. Items were scored from 1 (only Spanish) to 5 (only English) with a score of 3 indicating use of both languages equally. Total scores can range from 8 (low acculturation) to 40 (high acculturation). The SAS has been validated with Latin subgroups and is a valid indicator of acculturation. The SAS was completed at baseline (pre-intervention) only.

The City of Hope Quality of Life Breast Cancer questionnaire was used to assess total quality of life. It is a validated 45-item questionnaire and includes four dimensions of physical, psychological, social and spiritual well-being. The psychometric properties for the scale have been well documented with internal consistency reliability at 0.77–0.89 for the four subscales and 0.93 overall. The generic patient version include factor analysis and content validity with the FACT questionnaire ($r = 0.78$). Construct validity has been demonstrated by discriminating between known groups (Ferrell et al., 1995). The QOL-Breast Cancer tool was completed at each point of evaluation for both groups.

The Mishel Uncertainty in Illness Scale-Community (MUIS-C) (Mishel, 1997) is a 23-item self-administered measure of the uncertainty perceived in illness. Each item represents uncertainty on a 5-point Likert-type format ranging from 1 (strongly disagree) to 5 (strongly agree). MUIS-C is scored in a positive direction, with higher scores indicating a higher degree of uncertainty. Construct validity was demonstrated and internal consistency reliability of the MUIS -C ranges from 0.74–0.92 (Mishel, 1997). Internal consistency reliability in the present study was 0.88. Both groups completed the MUIS-C at each point of evaluation.

Distress was measured at each point of evaluation for both groups. *The Psychological Distress Thermometer is a single question screening instrument to evaluate patient's distress based on a scale of 1 to 10 during the past week. A score of 5 or higher may indicate the need to intervene. The distress thermometer has shown good reliability, sensitivity and specificity* (Jacobsen et al., 2005). *The National Comprehensive Cancer Network Psychological Distress guidelines recommend screening all cancer patients for psychological distress.* (Roth, Lowery, Davis, & Wilkins, 2005).

Analysis

The data were entered into a relational database and analyzed using SPSS v. 19 after being audited for accuracy. Descriptive statistics were calculated for all variables, and scale scores

were computed according to authors' instructions. Demographic and acculturation differences between groups were tested using contingency table analysis or independent t-tests, respectively, to identify possible covariates or blocking variables for hypothesis testing. Because country of birth and acculturation differed significantly between groups, the total acculturation score was used as a covariate in the two-way repeated measures Analysis of Covariance (ANCOVA) that was conducted on each study outcome. The primary end point is the 6 month measurement, while the 3 month measurement tests the immediate effect of the intervention

Results

Sample Demographics

A total of 52 Latina patients participated in the study, 41 of whom (79%) were born outside the United States. Most of the patients were born in Mexico (N=32), with the remainder from Central (N=6) or South America (N=3). Patients born outside the U.S. had lived in the U.S. between three and 42 years (mean=25.5, SD=10.9). Sixty-four percent of the patients chose to complete study surveys in Spanish. Twenty-eight patients were under age 50 (54%), with an average age of 50.9 (SD=9.2, range=36–69). Two-thirds had a high school education or college education, 34 (65%) were Catholic, and just over half were married. About 1/4th were employed and 1/5th were homemakers, while over half were retired or unemployed. The modal income was \$20,000 to \$100,000 per year (47%). Data gathered on clinical characteristics revealed that over 2/3rd of the patients reported one or more co-morbid conditions, although less than half of them specified their conditions. Half of those reporting had diabetes, and another half had hypertension. Arthritis, irritable bowel syndrome, depression, and asthma were also reported. Patients were most often diagnosed at stage II (44%), 62% had chemotherapy after surgery, 75% had radiation therapy, 48% were taking hormonal therapy, and 42% used complementary treatments. Table 1 displays the association between group membership and demographic characteristics. The control group had significantly higher personal, media, and total acculturation scores (were more acculturated) than the experimental group (see Table 2). Therefore, study hypotheses were tested using the total acculturation score as a covariate.

Uncertainty and Distress

Uncertainty and Distress means, standard deviations, and adjusted means by group over time are shown in Table 3. The experimental arm had a significant decrease in uncertainty which also happened somewhat in the control arm. However, the time interaction was not significant even when controlling for acculturation. The group by time interaction was not statistically significant, and in the experimental and control groups distress also dropped remaining in the moderate range.

Impact of intervention on Quality of life

The four domains of QOL increased slightly in both groups or remained unchanged, without significant group by time interaction (Table 4). The social and psychological well-being subscales had the lowest scores for both groups, followed by physical well-being and spiritual well-being. *The group by time interaction was not statistically significant for overall QOL, however, in the experimental arm, the post hoc difference between time 2 (5.40) and time 3 (5.71) approach significance (p=.052), with a small increase in overall QOL.*

Tables 5 and 6 provide single selected QOL items with mean scores of 5 or less over time for subjects in the experimental and control groups. These items are identified as potential areas of emphasis in future studies. Several individual items within each of the QOL

domains were troublesome for both groups. For physical well being, patients reported moderately low scores for symptoms such as hot flashes/sweats, menstrual changes, fatigue, vaginal dryness, sleep changes, pain and weight gain. The lowest scores were reported in the psychological and social domains. Patients reported significant distress related to treatment. Patients were very concerned about the impact of the treatment on their appearance and self-concept and did not feel that their life was back to normal. For social well-being, both groups reported significant family distress, concern for their daughters and other female relatives getting cancer, financial burden, sexuality issues, interference with their daily activities at home and employment issues. Finally, low scores were reported for uncertainty in the spiritual well-being domain.

Discussion

To the best of our knowledge this is the first bilingual education intervention that focused exclusively on Latina BCS. In this study, we pilot tested the *Nueva Luz* intervention that targeted a sample of English and Spanish speaking Latina BCS in order to improve QOL in the immediate survivorship period. The intervention was innovative in providing linguistic and cultural congruency in the intervention. The pilot study demonstrated feasibility and findings suggest that improvements were seen in overall QOL, uncertainty and distress, and that the effect was sustained over time. Although significant differences were seen on QOL, uncertainty and distress measures, these differences were small with only mild improvement observed. Our data clearly shows that Latina BCS have many QOL concerns. Physically, this sample (96%) reported problems with fatigue, a symptom described in the literature as distressing for cancer survivors across ethnic groups. (Eversley et al., 2005; Fatone, Moadel, Foley, Fleming, & Jandorf., 2007; Janz et al., 2007). The most prevalent symptoms reported include menstrual changes, hot flashes/sweats, weight gain, aches and pain and sleep changes. Similar findings have been reported on the symptom experienced by African-American and Non-Latina White breast cancer survivors after completing primary treatment (Bowen et al., 2007; Ganz, Kwan, Stanton, Bower, & Belin, 2011; Janz et al., 2009). Previous research indicates that Latinas and African-Americans reported lower physical well-being relative to Non-Latina White women (Janz et al., 2009).

The primary domains of concern were psychological and social for this cohort. The women in this study reported severe distress related to treatment, were concerned about changes in their appearance, and were fearful of recurrence, a new cancer and the cancer spreading. These findings are supported by a number of previous studies in multiethnic samples where Latinas have reported poorer psychological and emotional well-being than African-Americans and Non-Latina White breast cancer survivors (Ashing-Giwa, Tejero, Kim, Padilla, & Hellemann, 2007; Bowen, et al., 2007; Carver, Smith, Petronis, & Antoni, 2006; Janz, et al., 2009; Nápoles-Singer, Ortiz, O'Brien, Díaz-Méndez, & Pérez-Stable, 2007). Within the social domain, participants were extremely worried for their daughters and close female relatives getting breast cancer and concerned about family distress. Similar to other studies Latinas have reported the lowest level of social support relative to African-American and Non-Latina White women (Ashing-Giwa, Tejero, Kim, Padilla, & Hellemann, 2007; Galván, Buki, & Garcés, 2009; Janz et al., 2008). Other studies have reported that Latinas experience poorer QOL and increased distress compared to African-American and Non-Latina White women (Ashing-Giwa, Padilla, Tejero, & Kim, 2004; Spencer, et al., 1999).

Spirituality/Religiosity is central to Latino culture and provides the foundation for coping with breast cancer and its consequences (Campesino & Schwartz, 2006; Wildes et al., 2009) as evidenced by the high levels of spirituality in this sample. These results are supported by other studies that have documented that Latina breast cancer survivors with high levels of religiosity/spirituality feel closer to and find comfort in God (Buki, Salazar, & Pitton, 2009),

use prayer as a coping strategy and believed their faith was the key in recovering and coping with their illness and cancer survivorship experience (Fatone, Moadell, Foley, Fleming, & Jandorf, 2007; Wildes, et al., 2009). Other research suggests that faith and spiritual well being are also a very important component of QOL for African-American breast cancer survivors (Bellizzi et al., 2010; Russell, Von Ah, Giesler, Storniolo, & Haase, 2008). Spiritual care is essential to QOL and it is important to recognize the influence of religious and spiritual beliefs and its potential impact in adjusting to life after breast cancer treatment.

The mean score overtime for uncertainty in this sample was higher than mean scores for predominantly Non-Latina White samples of breast cancer survivors reported in other studies (Sammarco & Konecny, 2008; Sammarco & Konecny, 2010). This finding suggests that Latina breast cancer survivors may experience a greater amount of uncertainty related to their lack of understanding about breast cancer, side effects of cancer, financial concerns, fear of recurrence, and what to expect after primary treatment has been completed. Research suggests that increased uncertainty may have a negative impact on overall QOL (Sammarco & Konecny, 2008, 2010). Therefore it is important to develop culturally congruent strategies to reduce uncertainty in Latina BCS.

We had anticipated that the bilingual intervention would result in significant improvements in overall QOL for our Latina BCS. Although we were able to detect positive changes, these changes were mild. This may not be surprising given that our sample consisted of primarily Spanish speaking and low acculturated Latinas. Cancer stage may have also played a role in the results as well as ethnicity and acculturation. A previous study (Ashing-Giwa, 2006) has suggested that Latinas, especially those with low acculturation, have difficulty understanding and processing information related to their breast cancer provided in the medical care setting. The evidence on QOL in Latina BCS survivors suggests that Latinas face special challenges navigating the US health care system not only based on language, but also on other contextual factors such as financial and insurance barriers, low acculturation and communication problems, immigration status, lack of significant social support, unemployment, lack of transportation, and lack of childcare. These are shown to be correlates of poorer health outcomes in disadvantaged ethnic minorities (Ashing-Giwa, 2006; Ashing-Giwa, 2005; Janz et al., 2009; Lopez-Class, Gomez-Duarte, Graves, & Ashing-Giwa, 2011; Lopez-Class, Perret-Gentil, et al., 2011; Yanez, Thompson, & Stanton, 2011).

Study Limitations

Findings should be interpreted within the limitations and strengths of this pilot study. First, this was a mentored research funded grant with no additional funds for research personnel and as a result the principal investigator was responsible for all aspects of study procedures, including subject accrual, obtaining informed consent, intervention implementation and follow-up for both the experimental and attention control groups. Secondly, the sample consisted of Latina BCS receiving care at a NCI designated cancer center in southern California and may not be representative of a national sample of other Latina breast cancer survivors. The majority of the subjects were of Mexican ancestry. Also there was a diversity of ages and levels of education consequently results may not generalize to other Latina breast cancer survivor subgroups. Although the majority of the sample was monolingual in Spanish, the majority of the women had lived in the US an average of 25.5 years consequently the experiences of these participants may differ from recent Latina immigrants. The relatively small sample limits interpretability and generalizability. Despite these limitations, this pilot study provides notable and important findings on the feasibility of a linguistically and culturally sensitive intervention. These findings can inform further development and testing.

Conclusions

The findings from this pilot study suggest that Latina patients with breast cancer experience many QOL concerns and provide preliminary insight into the impact of a tailored bilingual education intervention on the QOL of Latina breast cancer survivors. Our study adds to the limited body of existing literature of Latina women living with breast cancer and offers some key directions for guiding the development of culturally and linguistically tailored QOL interventions. Results suggest that this understudied cancer population has multiple QOL and survivorship issues and concerns that might put them at risk for poor QOL and adjusting to survivorship, especially when compared to Non-Latina White breast cancer survivors. There is a need to provide breast cancer survivors with information, support and resources to assist them in managing their symptoms and other QOL issues beyond the immediate treatment period and into survivorship.

Implications for Nursing Practice

Latina breast cancer survivors are likely to benefit from bilingual interventions that can potentially help improve quality of life. More studies are needed to determine the efficacy of linguistically and culturally tailored interventions to improve QOL in post-treatment survivorship for this population. Non-English speaking and low acculturated Latinas are more vulnerable to poor QOL, increased distress and may benefit from bilingual education interventions that consider core cultural values and beliefs. There is evidence to indicate that Spanish monolingual or limited English speaking Latinas would like to receive cancer education in their native language (Janz et al., 2008) that is congruent with their cultural beliefs and values. Studies have indicated that patients have more difficulty communicating and understanding written and verbal information given by their health care provider (Fatone, Moadel, Foley, Fleming, & Jandorf, 2007). This pilot randomized clinical study broadens our understanding of the experience of Latina breast cancer survivors and contributes to the limited body of knowledge of interventional research in this understudied population. Results demonstrate that patients can be accrued, will fill out the questionnaires and participate in an intervention. More culturally congruent intervention research is needed to help improve health outcomes of Latina breast cancer survivors. Future studies should aim to test the intervention among larger samples with the statistical power to test for interaction among key variables. There is need to do more inquiry with the teaching materials to revise the intervention to it make stronger. There are tremendous cultural differences regarding communication styles, decision-making preferences, adherence to treatment, use of rituals and willingness to adopt surveillance and health maintenance behaviors post-cancer treatment among ethnic groups. Attention to these differences by health care practitioners is a necessary component of the delivery of culturally congruent healthcare in a diverse society. Breast cancer survivors need and deserve all the knowledge and tools available in their preferred language to improve quality of life, transition into survivorship, decrease burden and reduce or eliminate health disparities.

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Table 1

Demographic and Clinical Characteristics by Group

		Experimental	Control Group	Total	p Value
Age Group	36–49	16 (47.1)	12 (66.7)	28 (53.8)	.245
	50–66	18 (52.9)	6 (33.3)	24 (46.2)	
Birthplace	U.S.	4 (11.8)	7 (38.9)	11 (21.2)	.034
	Outside U.S.	30 (88.2)	11 (61.1)	41 (78.8)	
Education	< High School	14 (41.2)	3 (16.7)	17 (32.7)	.154
	High School	13 (38.2)	8 (44.4)	21 (40.4)	
	College +	7 (20.6)	7 (38.9)	14 (26.9)	
Religion	Catholic	23 (67.6)	11 (61.1)	34 (65.4)	.761
	All Other	11 (32.4)	7 (38.9)	18 (34.6)	
	Married	17 (50.0)	10 (55.6)	27 (51.9)	
Marital Status	Not Currently Married	17 (50.0)	8 (44.4)	25 (48.1)	.776
	Employed	6 (17.6)	8 (44.4)	14 (26.9)	
Employed	Homemaker	7 (20.6)	4 (22.2)	11 (21.2)	.083
	Retired, Unemployed	21 (61.8)	6 (33.3)	27 (51.9)	
Income	< \$20K	14 (58.3)	3 (21.4)	17 (44.7)	.067
	\$20K – \$100K	8 (33.3)	10 (71.4)	18 (47.4)	
	> \$100K	2 (8.3)	1 (7.1)	3 (7.9)	
Stage of Cancer when Diagnosed	Stage I	8 (23.5)	10 (55.6)	18 (34.6)	.063
	Stage II	17 (50.0)	6 (33.3)	23 (44.2)	
	Stage III	9 (26.5)	2 (11.1)	11 (21.2)	
Co-Morbid Conditions	No	9 (27.3)	7 (38.9)	16 (31.4)	.529
	Yes	24 (72.7)	11 (61.1)	35 (68.6)	
Chemotherapy	Before Surgery	13 (39.4)	5 (35.7)	18 (38.3)	1.000
	After Surgery	20 (60.6)	9 (64.3)	29 (61.7)	
Radiation Therapy	Yes	22 (71.0)	14 (82.4)	36 (75.0)	.497
	No	9 (29.0)	3 (17.6)	12 (25.0)	
Hormonal Therapy	Yes	11 (37.9)	11 (64.7)	22 (47.8)	.126

	Experimental	Control Group	Total	p Value
	18 (62.1)	6 (35.3)	24 (52.2)	
Complementary Treatments	Yes	7 (38.9)	22 (42.3)	.775
	No	11 (61.1)	30 (57.7)	
Language	English	10 (55.6)	19 (36.5)	.068
	Spanish	8 (44.4)	33 (63.5)	

Table 2

Acculturation Scores by Group

	Experimental Group Mean (SD)	Control Group Mean (SD)	p Value
Preferred Language for Personal Life	1.63 (1.03)	2.78 (1.69)	.015
Preferred Language for Media	2.28 (1.40)	3.31 (1.65)	.021
Total Acculturation Score	1.88 (1.10)	2.98 (1.64)	.017

Scale Range: 1=only Spanish to 5=only English

Table 3

Uncertainty and Distress Scores Across 3 Time Points

Time Points	Experimental		Control		p Value
	Mean (SD)	Adj Mean	Mean (SD)	Adj Mean	
*Uncertainty 1	57.81 (13.0)	56.31	52.72 (16.6)	55.40	.208
Uncertainty 2	58.75 (12.7)	57.28	48.94 (14.9)	51.55	
Uncertainty 3	55.41 (13.8)	53.51	50.40 (14.6)	53.76	
**Distress 1	4.43 (3.0)	4.38	4.00 (2.4)	4.09	.305
Distress 2	4.73 (3.2)	4.53	3.00 (2.2)	3.34	
Distress 3	4.00 (3.0)	3.82	3.39 (2.7)	3.69	

Time 1 = Baseline; Time 2 = 3 months; Time 3 = 6 months

* Uncertainty Scale Range: 1= Strongly Disagree to 5 Strongly Agree

** Distress Scale Range: 0= No Distress to 10= Extreme Distress

Table 4

QOL Subscales and Overall Scores Across 3 Time Points

Time Points	Experimental		Control	
	Mean (SD)	Adj Mean	Mean (SD)	Adj Mean
Overall QOL 1	5.46 (1.2)	5.54	5.98 (1.3)	5.85
Overall QOL 2	5.33 (1.3)	5.40	6.17 (1.6)	6.05
Overall QOL 3	5.59 (1.1)	5.71	6.25 (1.7)	6.03
Physical Well-Being 1	5.96 (1.9)	5.99	6.43 (1.8)	6.37
Physical Well-Being 2	5.87 (1.9)	5.89	6.45 (2.2)	6.42
Physical Well-Being 3	6.11 (2.0)	6.17	6.62 (1.9)	6.51
Psychological Well-Being 1	4.77 (1.6)	4.77	5.48 (1.8)	5.48
Psychological Well-Being 2	4.66 (1.5)	4.66	5.83 (1.8)	5.83
Psychological Well-Being 3	4.88 (1.4)	4.88	5.85 (2.0)	5.85
Social Well-Being 1	4.54 (1.7)	4.54	5.02 (1.5)	5.02
Social Well-Being 2	4.49 (1.7)	4.49	5.36 (2.0)	5.36
Social Well-Being 3	4.76 (1.7)	4.76	5.41 (2.3)	5.41
Spiritual Well-Being 1	7.84 (1.4)	7.71	7.91 (1.4)	8.13
Spiritual Well-Being 2	7.57 (1.3)	7.49	7.87 (1.5)	8.01
Spiritual Well-Being 3	7.77 (1.1)	7.74	7.89 (1.3)	7.95

(Range = 0–10; 0 = poor QOL, 10 = best QOL)

Table 5
 Experimental Group Quality of Life Scale: Individual items Across 3 Time Points

	Baseline		1 month		3 months	
	Mean	SD	Mean	SD	Mean	SD
Physical Well-Being						
1. Fatigue	5.29	2.79	5.26	3.22	5.22	2.64
3. Aches or pain	5.56	2.71	5.71	2.96	5.78	2.86
4. Sleep changes	5.44	2.78	5.26	3.29	5.31	3.00
5. Weight gain	5.91	3.00	5.65	2.98	4.47	2.93
9. Hot flashes/sweats	5.68	3.39	5.68	3.26	5.47	2.89
Psychological Well-Being						
11. How difficult is it for you to cope today as a result of your disease?	4.97	2.73	4.71	3.29	4.88	2.85
12. How difficult is it for you to cope today as a result of your treatment?	4.53	2.79	4.88	2.90	4.81	2.87
19. Has your illness or treatment caused changes in your appearance?	2.94	2.81	3.91	2.78	4.59	2.76
20. Has your illness or treatment caused changes in your self-concept?	3.64	2.74	4.79	2.95	5.19	2.69
21. How distressing was your treatment?	1.79	2.43	1.53	1.78	2.06	2.34
22. Time since completion of treatment?	4.00	2.91	4.21	3.18	4.42	3.10
23. How much anxiety do you have?	5.50	3.19	4.94	3.28	5.31	3.14
24. How much depression do you have?	5.39	3.20	5.15	3.27	5.78	3.06
25. How fearful are you of future diagnostic test?	4.00	3.36	3.32	2.76	3.34	2.74
26. How fearful are you of a new cancer	3.26	3.51	2.62	2.81	3.00	3.26
27. How fearful are you of a recurrence of cancer?	3.22	3.32	2.76	2.87	2.87	2.99
28. How fearful are you of a spreading of your cancer?	3.16	3.16	3.32	3.36	2.94	3.03
29. To what degree do you feel your life is back to normal?	4.09	2.60	4.26	2.56	3.59	2.47
Social Well-Being						
30. How distressing has your illness been for your family?	2.26	2.19	1.94	1.71	1.94	1.92
33. Is your sexuality impacted by your illness?	5.47	4.08	5.12	3.86	4.62	3.78
34. To what degree has your illness and treatment interfered with your employment?	4.33	4.29	4.56	4.10	4.62	3.89
35. To what degree has your illness and treatment interfered with your activities at home?	4.24	2.70	4.97	2.80	5.84	2.94
36. How much isolation do you feel is caused by your illness?	5.21	2.94	4.91	3.31	6.00	3.30
37. How much concern do you have for your daughter(s) or other close female relatives regarding breast cancer?	2.70	3.11	2.68	3.11	3.13	3.55

	Baseline		1 month		3 months	
	Mean	SD	Mean	SD	Mean	SD
Physical Well-Being						
38. How much financial burden have you incurred as a result of your illness and treatment?	3.12	3.33	2.94	3.28	2.59	2.98
Spiritual Well-Being						
42. How much uncertainty do you feel about the future?	3.91	3.56	2.94	2.67	3.42	2.62

(Range = 0–10; 0 = poor QOL to 10 = best QOL).

Table 6

Control Group Quality of Life Scale: Individual items Across 3 Time Points

	Baseline		1 month		3 months	
	Mean	SD	Mean	SD	Mean	SD
Physical Well-Being						
1. Vaginal dryness/menopausal symptoms	5.39	3.65	4.94	3.58	5.17	3.57
2. Menstrual changes	4.78	3.80	4.38	3.46	7.14	3.19
3. Hot flashes/sweats	4.11	2.76	4.41	3.00	4.39	2.85
4. Has your illness or treatment caused changes in your appearance?	3.50	3.19	5.17	3.13	4.22	3.34
Psychological Well-Being						
5. Has your illness or treatment caused changes in your self-concept?	4.94	3.90	5.88	3.72	5.82	3.32
6. How difficult is it for you to cope today as a result of your treatment?	2.94	2.69	2.83	2.92	2.83	2.79
7. Time since completion of treatment?	4.71	2.97	5.89	2.91	6.06	3.19
8. How much anxiety do you have?	5.28	2.65	5.83	2.88	5.94	2.98
9. How fearful are you of future diagnostic test?	4.83	2.79	4.50	2.85	4.67	3.01
10. How fearful are you of a new cancer?	4.17	3.63	4.56	3.24	5.00	3.07
11. How fearful are you of a recurrence of cancer?	4.35	3.62	3.61	3.17	4.61	3.20
12. How fearful are you of spreading of your cancer?	4.78	3.41	4.72	3.79	4.83	3.02
13. To what degree do you feel your life is back to normal?	4.17	2.31	2.67	2.09	3.56	3.03
Social Well-Being						
14. How distressing has your illness been for your family?	2.22	2.46	2.72	2.59	2.78	2.56
15. Is your sexuality impacted by your illness?	4.25	3.59	4.06	3.64	4.31	3.98
16. How much concern do you have for your daughter(s) or other close female relatives regarding breast cancer?	2.67	3.93	2.83	3.68	3.00	3.36
17. How much financial burden have you incurred as a result of your illness and treatment?	3.00	2.87	2.88	3.12	3.67	3.25
Spiritual Well Being						
18. How much uncertainty do you feel about the future?	5.33	3.34	4.67	3.55	4.94	3.73

Range = 0–10: 0 = poor QOL to 10 = best QOL