

Transition From Treatment to Survivorship: Effects of a Psychoeducational Intervention on Quality of Life in Breast Cancer Survivors

Karen Dow Meneses, PhD, RN, FAAN, Patrick McNees, PhD, FAAN, Victoria W. Loerzel, RN, MSN, AOCN®, Xiaogang Su, PhD, Ying Zhang, PhD, and Lauren A. Hassey, BSN

Purpose/Objectives: To examine the effectiveness of a psychoeducational intervention on quality of life (QOL) in breast cancer survivors in post-treatment survivorship.

Design: A randomized controlled trial.

Setting: An academic center collaborating with a regional cancer center in the southeastern United States.

Sample: 256 breast cancer survivors.

Methods: Women were randomly assigned to the experimental or wait control group. The Breast Cancer Education Intervention (BCEI) study was delivered in three face-to-face sessions and five monthly follow-up sessions (three by telephone and two in person). The control group received four monthly attention control telephone calls and the BCEI at month 6. Data were collected at baseline, three and six months after the BCEI for the experimental group, and one month after the BCEI (at month 7) for the wait control group.

Main Research Variables: Primary endpoints were overall QOL and physical, psychological, social, and spiritual well-being.

Findings: No differences in QOL were reported at baseline between groups. The experimental group reported improved QOL at three months, whereas the wait control group reported a significant decline in QOL. The experimental group reported continued maintenance of QOL at six months. Although the wait control group reported improved QOL at six months, significant differences continued to exist between the groups.

Conclusions: The BCEI was an effective intervention in improving QOL during the first year of breast cancer survivorship. Treatment effects were durable over time.

Implications for Nursing: Post-treatment survivorship has not been empirically studied to a large degree. The BCEI is one of the few interventions demonstrating effectiveness among survivors after primary treatment, suggesting that oncology nurses may be uniquely positioned to provide safe passage using education and support.

Quality of life (QOL) during post-treatment breast cancer survivorship is a relatively new, emerging, and promising area of investigation. Numerous multidisciplinary studies conducted since the 1980s have documented QOL in several domains, including physical function, psychological distress, social and family concerns, and spiritual issues, among breast cancer survivors. Behavioral interventions to ameliorate QOL problems include a wide variety of methods such as psychoeducational support, individual and group counseling, expressive therapy, and cognitive behavioral therapy (Institute of Medicine & National Research Council,

Key Points . . .

- Few randomized controlled trials have been conducted addressing the transition from treatment to survivorship among patients with cancer.
- Psychoeducational support interventions are demonstrated to be effective.
- The Breast Cancer Education Intervention, a psychoeducational support intervention designed for breast cancer survivors, can improve quality of life.

2004). The preponderance of behavioral interventions has been delivered primarily during active cancer treatment. A small but growing number of multidisciplinary studies have reported interventions designed for the transition from cancer treatment to cancer survivorship.

The primary purpose of this article is to report the results of the effects of the Breast Cancer Education Intervention (BCEI) Study, a QOL survivorship intervention delivered using psychoeducational support and targeting women with early-stage breast cancer in the first year of post-treatment survivorship. The aims of this article are consistent with the

Karen Dow Meneses, PhD, RN, FAAN, is a professor and associate dean for research in the School of Nursing at the University of Alabama at Birmingham (UAB); Patrick McNees, PhD, FAAN, is a professor and the director of research, innovation, and technology in the School of Nursing and the School of Health Professions at UAB; Victoria W. Loerzel, RN, MSN, AOCN®, is an assistant professor in the School of Nursing at the University of Central Florida (UCF) in Orlando and was the project director for the Breast Cancer Education Intervention (BCEI) study at UCF; Xiaogang Su, PhD, is an associate professor in the Department of Statistics at UCF; Ying Zhang, PhD, is an associate professor in the Department of Biostatistics at the University of Iowa in Iowa City; and Lauren A. Hassey, BSN, is a research assistant for the BCEI study at UCF. (Submitted December 2006. Accepted for publication April 3, 2007.)

Digital Object Identifier: 10.1188/07.ONF.1007-1016

study aims: (a) to describe the effect of the BCEI study on overall QOL, (b) to examine whether the intervention effects were retained over time, and (c) to describe the differential effects of the BCEI study on QOL in the domains of physical, psychological, social, and spiritual well-being.

Literature Review

Quality of Life and Breast Cancer

The literature on QOL and breast cancer is vast and synthesizing it is outside the scope of this article. In general, however, multidisciplinary studies document the influence of breast cancer on overall QOL (Ashbury, Cameron, Mercer, Fitch, & Nielsen, 1998; Ashing-Giwa, Ganz, & Petersen, 1999; Avis, Crawford, & Manuel, 2005; Casso, Buist, & Taplin, 2004; Dirksen & Erickson, 2002; Dow, Ferrell, Haberman, & Eaton, 1999; Dow, Ferrell, Leigh, Ly, & Gulasekaram, 1996; Ferrans, 1994; Giedzinska, Meyerowitz, Ganz, & Rowland, 2004; Gotay & Muraoka, 1998; Heidrich, Egan, Hengudomsub, & Randolph, 2006; Holzner et al., 2001; King, Kenny, Shiell, Hall, & Boyages, 2000; Vacek, Winstead-Fry, Secker-Walker, Hooper, & Plante, 2003; Wyatt, Kurtz, & Liken, 1993); physical functioning and treatment side effects (Armer, 2005; Armer, Fu, Wainstock, Zagar, & Jacobs, 2004; Armer & Heckathorn, 2005; Barton & Loprinzi, 2002; Barton et al., 2003; Bender et al., 2006; Berger et al., 2002, 2003; Bower et al., 2006; Carpenter & Andrykowski, 1999; Carpenter et al., 2004, 2007; Cimprich, Janz, et al., 2005; Cimprich & Ronis, 2003; Cimprich, So, Ronis, & Trask, 2005; Courneya, Blanchard, & Laing, 2001; Knobf, 2002; Loerzel, Dow, & McNees, 2006; Mock et al., 2005); psychological well-being (Bellizzi & Blank, 2006; Lewis et al., 2001); social, family, and work relationships (Bednarek & Bradley, 2005; Kinney, Rodgers, Nash, & Bray, 2003; Kurtz, Wyatt, & Kurtz, 1995; Lewis, Casey, Brandt, Shands, & Zahlis, 2006; Lewis & Deal, 1995; Mast, 1998; Northouse et al., 2002; Northouse, Kershaw, Mood, & Schafenacker, 2005; Payne, Piper, Rabinowitz, & Zimmerman, 2006; Stewart et al., 2001; Waltman et al., 2003); and spiritual concerns (Bauer-Wu & Farran, 2005; Mellon, 2002; Meraviglia, 2006; Wonghongkul, Dechaprom, Phumivichuvate, & Losawatkul, 2006). In addition, a recent comprehensive literature review evaluated the many contributions of nurse scientists that are advancing research in breast cancer (Meneses, in review).

Cancer Survivorship Intervention Research

Intervention studies during active cancer treatment: Intervention studies historically have been developed for delivery during diagnosis and active treatment. The types of interventions used during cancer therapy include telephone counseling (Badger, Segrin, Meek, Lopez, & Bonham, 2004; Chamberlain-Wilmoth, Tulman, Coleman, Stewart, & Samarel, 2006; Coleman et al., 2005; Marcus et al., 1998; Sandgren & McCaul, 2006), cognitive-behavioral therapy (Lewis et al., 2006) face-to-face counseling and support (Braden, Mishel, & Longman, 1998), combination face-to-face and peer discussion (Helgeson, Cohen, Schulz, & Yasko, 2001; Yates et al., 2005), group intervention (Hosaka et al., 2001), education and counseling (Hoskins et al., 2001), and short-term support (Miyashita, 2005; Rawl et al., 2002). However, some longitudinal studies were initiated during active treatment and included extended follow-up in post-treatment survivorship.

Intervention studies during post-treatment survivorship: Four breast cancer intervention studies designed for post-treatment survivorship were identified in the literature (Cimprich, Janz, et al., 2005; Mishel et al., 2005; Scheier et al., 2005; Stanton et al., 2005). The number is small because most studies conducted during post-treatment survivorship did not have interventions and, thus, were excluded from the discussion. In addition, intervention studies in advanced breast cancer were excluded from the review.

Post-treatment intervention studies used variations of psychoeducational support. The methods for intervention delivery ranged from standard National Cancer Institute (NCI) print materials, peer-modeling videotapes, or one-on-one telephone or in-person counseling (Stanton et al., 2005); four group education sessions (Scheier et al., 2005); four weekly telephone sessions (Mishel et al., 2005); to four individual sessions, two small group sessions, and two telephone contacts (Cimprich, Janz, et al., 2005). Intervention "dose" was not specifically described in the studies, but all were short-term interventions. Three studies reported intervention results (Mishel et al.; Scheier et al.; Stanton et al.), whereas one reported baseline data (Cimprich, Janz, et al.).

The literature shows the multidisciplinary interest in QOL and breast cancer. Psychoeducational support interventions have shown efficacy in QOL and breast cancer. A small but growing number of intervention studies in post-treatment survivorship have applied variations of psychoeducational and support interventions to reduce QOL-related issues.

Conceptual Framework

QOL was the conceptual framework used to guide the identification and development of the BCEI study. QOL was defined as a multidimensional construct consisting of four domains: physical, psychological, social, and spiritual well-being (Dow et al., 1996; Ferrell, Dow, & Grant, 1995). Each domain contributes to an individual's perception of overall QOL. As individuals progress along the cancer continuum, QOL is considered dynamic. This study specifically focused on QOL in post-treatment survivorship, which is consistent with the NCI (2006) cancer survivorship research that concentrates on post-treatment concerns.

Methods

Design

The BCEI study was a randomized trial with subjects assigned to the experimental group or the wait control group. A wait control feature was used to enhance subject retention, address ethical consideration of subjects being denied potentially helpful treatment, and allow for the evaluation of the effects of the BCEI study on all subjects. The intervention package was delivered over a six-month period. During the same six-month period, the wait control group received initial face-to-face baseline assessment, four attention control telephone calls, three face-to-face education and support sessions, and one face-to-face follow-up education and support session.

The Intervention

The BCEI study was a psychoeducational support intervention that consisted of individual face-to-face education and support sessions, telephone and face-to-face follow-up

education and support sessions, and written and audiotaped reinforcement. Figure 1 shows the sequence of the various intervention components.

The three education and support sessions focused on common issues facing breast cancer survivors. Each education and support session was conducted in person and lasted about 60–90 minutes. Session 1 focused on education about physical changes after treatment, including cancer-related fatigue, lymphedema, and pain. Session 2 focused on personal and emotional changes after breast cancer (e.g., menopausal symptoms, hot flashes, sleep problems, sexual function, fertility when appropriate for premenopausal women) and ways to maintain health. Discussions about family and social relationships and work, financial, and insurance concerns also were covered, as well as ways to promote healthy lifestyle behaviors such as improving physical activity, maintaining healthy nutrition and diet, and adhering to cancer surveillance. Session 3 focused on

psychological distress (e.g., mood swings, anxiety, depression, fear of recurrence) and the spiritual effects of cancer (e.g., uncertainty, meaning in illness) and its treatment.

Face-to-face education and support sessions had a specific and unique format: In the first 30 minutes, all subjects received the same instruction, and the remaining 30 minutes were tailored to the unique problems and concerns facing each individual subject. In Session 1, subjects received information about pain, cancer-related fatigue, and lymphedema. The intervention nurse described lymphedema, explained why subjects were at risk, and educated them about ways to prevent or manage lymphedema. The tailored component of the education and support sessions focused on unique concerns identified by each subject. For example, if a subject had specific concerns about lymphedema, the intervention nurse discussed specific ways to manage the symptom based on the subject's unique situation. The intervention nurse helped subjects to develop tailored management plans that may have included homework assignments, reading about the topic, listening to an audiotape, or trying new self-management tips.

Written and audiotaped materials supplemented the education and support sessions. Participants received the BCEI Education Binder, a 50-page notebook of materials divided into three sections that corresponded with each education and support session. Thirty-eight tip sheets ranging from one to three pages each were distributed to participants, offered management for specific concerns or problems, and used to reinforce education and support. Three audiotapes based on each of the three education and support sessions helped to reinforce learning in situations where participants preferred listening rather than reading.

Follow-up education and support sessions were conducted in person and by telephone. Each follow-up session lasted 30 minutes and was designed to evaluate subjects' symptom management, reinforce learning, and provide support. The intervention nurse also reviewed pertinent areas in the BCEI binder, tip sheets, and audiotaped materials.

Specific Aims and Hypotheses

The specific aims and hypotheses of the study were to determine the effect of the BCEI study on overall QOL and on the individual QOL domains and to examine whether the effects of the intervention were durable over time.

Subject Recruitment and Accrual

Subjects were recruited from a regional cancer center and private oncology offices in the southeastern United States. Women at least 21 years of age, with histologically confirmed stage 0–II breast cancer and no evidence of local recurrence or metastatic disease, within one year of diagnosis, who had surgery at least one month before, who received radiation therapy or chemotherapy to recover from acute treatment side effects, and who were able to communicate in English were eligible to participate. Subjects may have been on hormonal therapy (i.e., aromatase inhibitor or tamoxifen) at study entry.

Procedure

Following study approval by the respective institutional review board of the university where the researchers were affiliated at the time of the study and the participating cancer centers, potential subjects were identified by the cancer center or private oncology office nursing staff using an eligibility

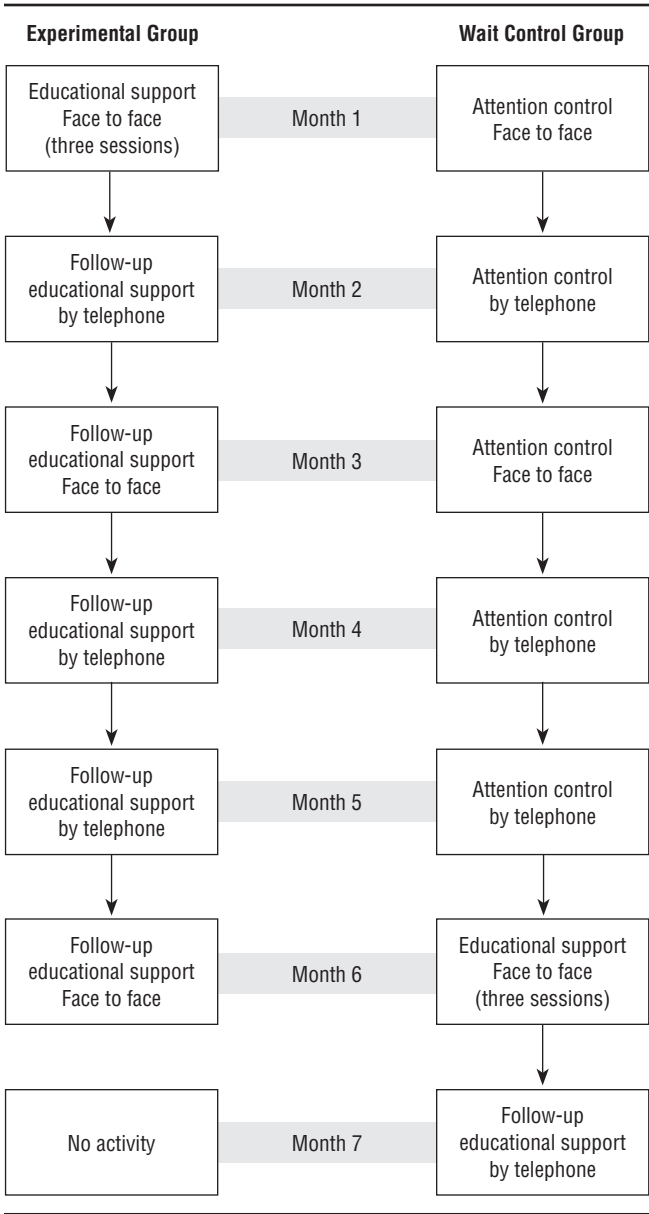


Figure 1. Intervention Schema

checklist devised from consideration of the inclusion and exclusion criteria. A staff member briefly explained the study and determined eligible subjects' interest in participating. Subjects expressing interest signed a consent form giving permission to release their name, telephone number, and address to the BCEI research office. Upon receipt of the consent form, the BCEI project director followed up with potential subjects, explained the study objectives and time commitment, and answered any questions.

Once subjects agreed to participate, they were assigned to a BCEI research nurse who obtained written informed consent consistent with university, cancer center, and federal policies prior to study entry. Next, subjects completed baseline measures. They were randomly assigned to a treatment arm (i.e., experimental or wait control group) by the study biostatistician. The study eligibility and enrollment schema is depicted in Figure 2.

Instruments

The Breast Cancer Treatment and Sociodemographic Data Tool is a 32-item instrument used to capture breast cancer treatment variables (e.g., surgery, radiation therapy, chemotherapy, hormonal therapy, anti-HER2 therapy) and sociodemographic characteristics (e.g., age, race, ethnicity, education, marital status, employment status, telephone and

communication patterns, family income, breast cancer history and treatment). Potential confounding variables (e.g., education, type of breast cancer therapy) were treated as covariates in data analysis.

Quality of Life–Breast Cancer Survivors is a 50-item scale that measures QOL in women with breast cancer and was adapted from the QOL-Cancer Survivors Scale (Dow et al., 1996; Ferrell et al., 1995). The items use a 10-point rating scale to describe overall QOL problems or concerns and within four identified domains—physical, psychological, social, and spiritual well-being. The tool is scored from 0–10, with lower scores indicating better QOL. Test-retest reliability of the original QOL-Cancer Survivors Scale was 0.89, and Cronbach's alpha was 0.93. Alpha coefficients for the current study were 0.93 for the total QOL score, 0.99 for the physical domain, 0.96 for the psychological domain, and 0.85 for both the social and spiritual domains.

Intervention Treatment Fidelity

Several strategies for treatment fidelity, including study design, interventionists' training, and intervention delivery and receipt, were incorporated into the BCEI study. The strategies were consistent with others reported in the literature (Bellg et al., 2004; Resnick, Bellg, et al., 2005; Resnick, Inguito, et al., 2005; Santacroce, Maccarelli, & Grey, 2004). Prior to the start of the study, an extensive BCEI procedure manual was developed; throughout the trial, the manual was reviewed regularly and updated periodically. The manual included detailed procedures for the standardized intervention protocol, ensuring consistency of data collection and management. Each member of the BCEI research team received didactic training in breast cancer survivorship, QOL, and the intervention protocol. In addition, the intervention nurses participated in three role-playing education and support sessions and follow-up sessions to standardize the intervention.

During intervention delivery, all education and support sessions were tape recorded. The study investigator reviewed a random sample of 20% of all education and support sessions using a specially designed quality assurance monitoring checklist. When any disagreement with the checklist occurred, outcomes were reviewed with the intervention nurses and adjustments made as needed. In addition, the BCEI research team discussed intervention delivery and fidelity issues at monthly team meetings. Strategies to monitor receipt of treatment were devised during follow-up education and support sessions where the intervention nurses reviewed the subjects' homework, provided feedback, and assessed ongoing behavioral changes. After completion of the clinical trial, study subjects were asked to participate in a summative evaluation of the delivery of the BCEI intervention components (i.e., education and support, follow-up education and support, face-to-face and telephone discussions, written materials, and audiotapes).

Data Analysis

The research design is essentially a randomized, controlled longitudinal intervention study. The baseline measurements together with the longitudinal data enable comparison before and after the intervention. Simultaneously, the inclusion of the wait control group facilitated a natural history study of QOL in breast cancer survivors. By comparing the experimental group with the wait control group, the researchers were able to obtain a more genuine assessment of the BCEI.

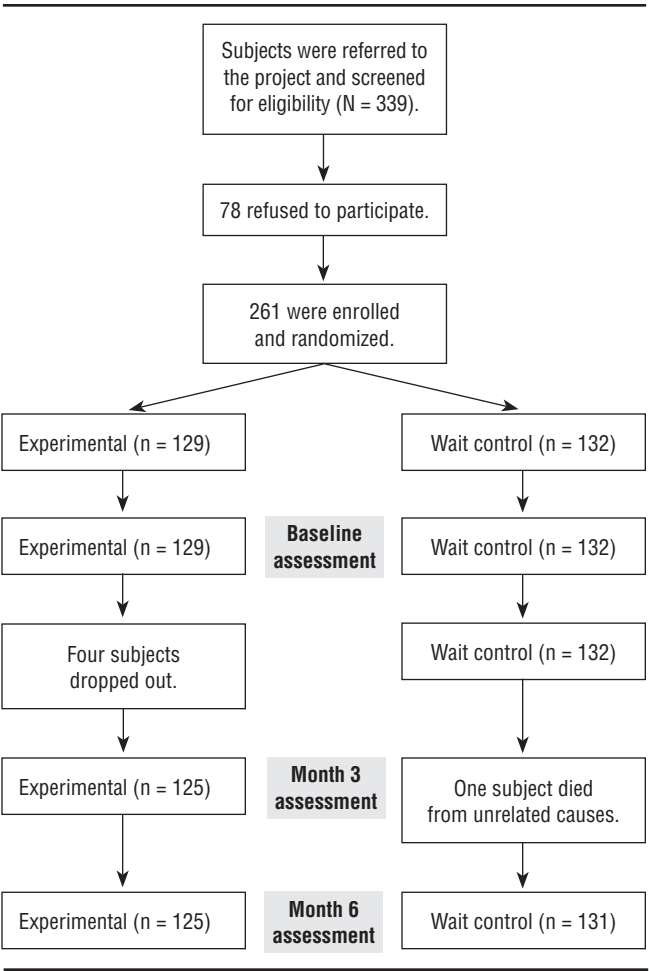


Figure 2. Study Schema

In addition, the wait control group received the BCEI at the end of the study.

To measure the efficacy of the BCEI, the endpoint variable of interest was the QOL score, which is the overall average computed from four subscale measures (physical, psychological, social, and spiritual well-being). The analysis was based on data collected at three time points—baseline, month 3 (time 2), and month 6 (time 3).

The generalized estimating equation (GEE) method for longitudinal data (Liang & Zeger, 1986) was the primary approach used to establish the efficacy of the BCEI study. The analysis was performed with and without adjustment for baseline covariates to account for a possible imbalance in baseline characteristics between the two groups and identify potential confounding effects on the intervention treatment. The GEE approach is flexible enough to allow for an intent-to-treat analysis by naturally integrating the few patients who dropped out after enrollment in the study. A number of two-sample *t* tests and paired *t* tests were used with a Bonferroni-type adjustment to make detailed comparisons, which helped to assess the sustained effect of the BCEI. Data were entered using SPSS® version 12 (SPSS Inc.). Statistical analysis was conducted using R (R Development Core Team, 2006).

Results

Baseline Characteristics

A total of 261 women participated in the study. Four women in the experimental group withdrew during the first month of participation. One subject in the wait control group died from a non-cancer-related cause during the study. A total of 256 subjects remained in the study, and complete data for the subjects at all study time points were available (98% retention).

Subjects' mean age was 54.5 years (SD = 11.58); 82% were Caucasian, 9% were African American, 6% were Hispanic, and the remainder were Asian, Middle Eastern, and Native American. English was the primary language for 95%, and Spanish was the primary language for 4%. Almost 30% had a high school education but did not attend college, and 48% had a college education. Sixty-eight percent were married or living with a partner; 32% were single, divorced, or widowed. Sixty-two percent of subjects were employed full- or part-time, with 45% having annual family incomes of less than \$50,000. More than 90% had not received counseling or participated in cancer support groups.

When breast cancer treatment was considered, more than 60% had breast-conserving surgery and 40% had single or bilateral mastectomy. More than 69% received primary or postoperative radiation therapy, and 54% received combination chemotherapy. More than 76% were taking tamoxifen or an aromatase inhibitor. Baseline demographic characteristics and treatment variables were compared to determine whether any significant baseline differences existed between groups, but none was found.

Effect of the Intervention on Overall Quality of Life

At baseline, no significant difference existed in overall QOL scores between groups. Figure 3 plots the mean QOL scores at the three time points for both groups. A lower value represents an improvement in QOL, whereas a higher value represents a decline in QOL. Both groups had similar mean

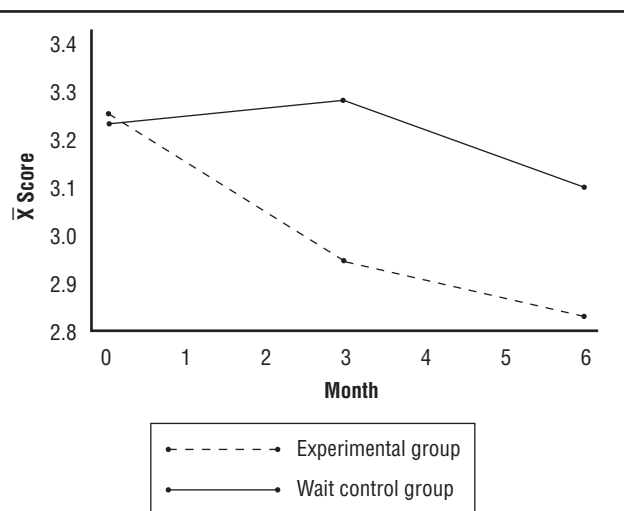


Figure 3. Plot of Mean Quality-of-Life Scores

QOL scores at baseline, which was confirmed by the associated two-sample *t* test (0.1613 with two-sided *p* = 0.872). At time 2, QOL scores in the wait control group were slightly worse, but they improved by time 3. In contrast, the experimental group showed dramatic improvement in QOL at time 2 and continued improvement at time 3. Overall QOL remained better at time 3 for those in the experimental group compared with the wait control group.

The GEE approach was used to draw the overall statistical conclusion about the effectiveness of the BCEI study. To proceed, two difference scores, time 2 versus baseline and time 3 versus baseline, were computed for each subject. The GEE marginal model was based on the two difference scores. A binary variable that distinguishes the two treatment groups was added into the model as a predictor. As a result, the within-group effect was filtered out so that the GEE approach could focus better on the between-group comparison while dealing with the correlation between two difference scores from the same subject. Other than the original demographic variables, a binary covariate of time, taking values at time 2 and time 3, also was included. Taken together, they were used as covariates in the GEE model and could be potential effect modifiers or confounders for the intervention effect.

Two GEE marginal models were fit: One included month as a covariate, and the other included all covariates. No significant interaction terms were found between the intervention and other covariates, including time, in both models. The slope estimates for the treatment effect (i.e., the BCEI) are -0.298 and -0.308, respectively, without and with adjustment for other covariates (both having *p* < 0.001), suggesting that the confounding effect of other covariates on the BCEI study was negligible.

Within group differences were considered. Because the researchers made a total of six inferences, applying Bonferroni-type adjustment would lead to a joint significance level of 0.05 divided by 6 = 0.0083. Results showed that the experimental group's QOL greatly improved at both time points when compared to their baseline and to the wait control group. QOL in the wait control group declined by time 2 but did improve at time 3. Thus, the BCEI study was effective in

improving QOL in the experimental group at time 2 and time 3. Furthermore, significant between-group differences in QOL were found at time 3.

Retention of Intervention Effects Over Time

The second specific aim examined whether the effects of the BCEI on QOL were retained through time 3 for the experimental group; the researchers hypothesized that the intervention effects would be durable. Table 1 presents the comparisons among three points: (a) baseline and time 2, (b) baseline and time 3, and (c) time 2 and time 3. The values represent mean score changes. The paired t test was used to assess changes between every pair of time points for each group, and the two-sample t test was used to compare the mean score changes between the experimental group and the wait control group.

At time 2, the experimental group reflected significantly superior overall QOL scores compared to baseline scores ($p < 0.001$). At time 3, overall QOL in the experimental group remained significantly better compared to baseline ($p < 0.001$). Although the primary intent of time 2 to time 3 analysis for the experimental group was to determine the durability of the BCEI study effect, the group experienced improved QOL from time 2 to time 3. Therefore, the effect of the BCEI was retained through time 3.

The Intervention’s Effect on the Quality-of-Life Domains

The third specific aim of this study was to determine the effects of the BCEI on the four QOL domains: physical, psychological, social, and spiritual well-being. Figure 4 plots the mean scores for each domain; the QOL pattern is similar to Figure 3. Both groups had similar mean domain QOL scores at baseline; but at times 2 and 3, the experimental group had lower mean scores (i.e., improved QOL) compared to the

wait control group. The results were evident in psychological and social well-being scores between the two groups. The improvements can be attributed to the efficacy of the BCEI in enhancing QOL.

The GEE approach was used to draw a statistical conclusion (see Table 2). GEE analysis showed significant differences in overall QOL and psychological and social well-being scores between the two groups ($p < 0.001$). However, GEE analyses showed no significant differences in physical or spiritual well-being.

Discussion

At baseline, no differences existed in QOL scores between the two groups, thus establishing comparability. However, after the BCEI study was initiated, a significant difference in QOL emerged between the two groups. The experimental group’s QOL scores showed significant improvement, whereas the wait control group’s QOL scores showed decline. Thus, the efficacy of the BCEI has been established.

The researchers anticipated that the BCEI study effects would be maintained through time 3 for the experimental group, but QOL actually improved for that period. The positive effects of the BCEI for the experimental group through time 3 compared with moderate QOL improvement for the wait control group. The improvement from time 2 to time 3 in the wait control group resulted in less pronounced between-group differences. However, the experimental group continued to reflect significantly better overall QOL than did the wait control group. Thus, not only was the durability of the intervention demonstrated, but the differences between groups were maintained.

Several aspects of the results are interesting and deserve additional consideration. During what is perhaps a critical period early after treatment, the BCEI resulted in substantial improvements in QOL; however, those who did not receive the BCEI experienced a decline in QOL. That period could represent an at-risk time when patients are particularly vulnerable, in need of supporting alternatives for safe passage to later survivorship, and highly amenable to intervention.

The effects of the BCEI in the experimental group were not only maintained over the three-month period from time 2 to time 3, but QOL improved during that period. The study design does not allow for a definitive conclusion, but the QOL improvement may be because the BCEI is an ongoing, six-month intervention process in which follow-up reinforcement of education and support are critical.

QOL for the wait control group improved from time 2 to time 3, which is noteworthy. Marked between-group differences still existed at time 3, but the improvements in the wait control group are nonetheless impressive. The period immediately following treatment may be one in which patients are particularly vulnerable and has been mentioned previously (Institute of Medicine & National Research Council, 2006). Improvements in QOL for the wait control group may be a result of longer-term adaptation or resilience of breast cancer survivors that surfaces after a few months, or the improvement in QOL scores for the wait control group may be related to a reinterpretation of “normalcy” after treatment.

In examining the differential effect of the BCEI study on the physical, psychological, social, and spiritual well-being domains of QOL between the two groups, several explana-

Table 1. Between- and Within-Group Comparisons in Overall Quality of Life

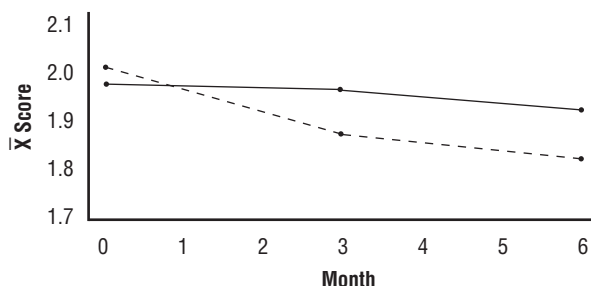
Time Frame	Score Changes			p
	\bar{X}	SD	Paired T Test	
Baseline to month 3				
Wait control group	0.042	0.752	0.642	0.522
Experimental group	-0.309	0.834	-4.142	< 0.001
Two-sample t test	-28.420	-	-	< 0.001
Baseline to month 6				
Wait control group	-0.162	0.765	-2.423	0.016
Experimental group	-0.405	0.879	-5.151	< 0.001
Two-sample t test	-18.895	-	-	< 0.001
Month 3 to month 6				
Wait control group	-0.199	0.784	-2.909	0.004
Experimental group	-0.100	0.661	-1.687	0.094
Two-sample t test	-1.096	-	-	0.274

Experimental group N = 125

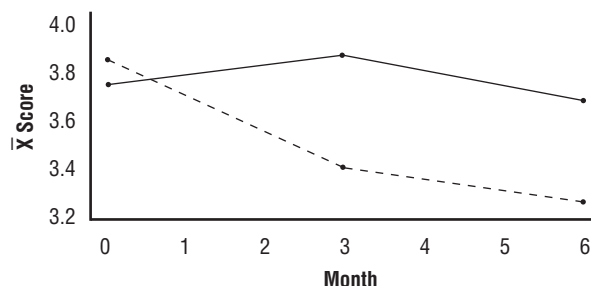
Wait control group N = 132

Note. The paired t test was used to assess changes between each pair of time points for each group, whereas the two-sample t test was used to compare the mean score changes between the experimental and wait control groups. All reported p values are two-sided.

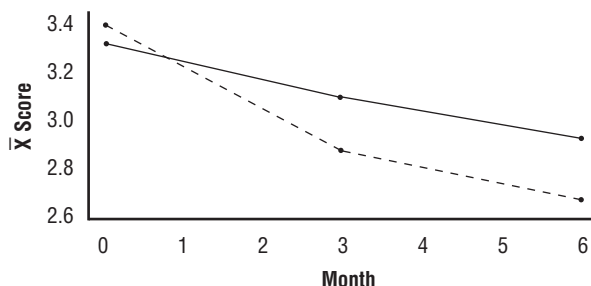
Physical Domain



Psychological Domain



Social Domain



Spiritual Domain

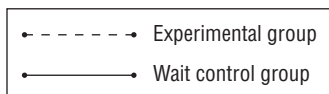
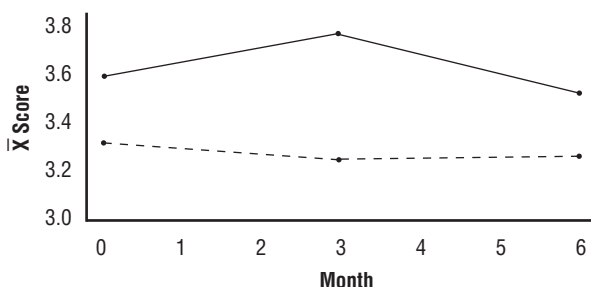


Figure 4. Plots of the Mean Domain Scores

tions are offered. First, study results add further evidence in the literature that demonstrates enhanced psychological and social adjustment with psychoeducational interventions (Scheier et al., 2005; Stanton et al., 2005). Second, although the experimental group slightly improved and the wait control group declined in physical well-being scores at time 2, the differences were less evident at time 3. Subjects may have attributed aches, pains, and fatigue to aging or conditions preexisting cancer (e.g., arthritis, osteoporosis) or may have been in a phase of relatively good physical well-being. Third, the differences in spiritual well-being scores showed a marked difference between the two groups at time 2, with similar improvement in the experimental group and a decline in the wait control group. However, by time 3, the wait control group showed improvement. Perceptions about the meaning of illness may have been incorporated over the six-month period with reduced certainty over the future.

Implications for Research and Practice

Several implications for practice and research become apparent. First, this randomized trial adds to a very small but growing body of psychoeducational interventions to improve QOL in post-treatment survivorship. Differential aspects of QOL contributed to overall improvement in QOL, notably psychological and social interventions. Determining what proportion of education or emotional support contributed to improved outcomes is important in future cancer survivorship research.

Second, this study contributes to a clearer articulation and description of the actual components of the intervention to help future researchers clarify their respective descriptions of delivery methods. Although this study used a combination of individual face-to-face and telephone delivery over a six-month period, additional modes or delivery systems for providing psychoeducational support interventions tailored to the target population should be examined in future studies. For example, telephone or electronic communication may be the most efficacious for at-risk, underserved populations in rural areas, whereas electronic means may be best for international breast cancer survivors (Fogel, Albert, Schnabel, Ditkoff, & Neugut, 2002; Gustafson et al., 2005; Meneses & McNees, in press). In brief, if an effective intervention or treatment is identified, the optimal delivery systems for various populations remain a question of considerable interest.

Third, the intervention dose for each education and support component can be measured in future studies to further develop intervention treatment standards and adhere to treatment fidelity. Additionally, a discussion about treatment fidelity deserves attention in future behavioral intervention studies. A detailed description of the actual delivery components with treatment dose and strategies for treatment fidelity can improve the confidence in study results.

Theoretical and conceptual underpinnings currently are based on a variety of frameworks that do not fully describe the timing of interventions after treatment. The number of long-term cancer survivors is growing, so future studies that combine a theoretical or conceptual framework within a cancer survivorship context would help to illuminate the differences in post-treatment concerns. Such differences may be critically important in helping practitioners discern optimal

Table 2. Generalized Estimating Equation Comparisons Between Overall Quality of Life and Quality-of-Life Domain With and Without Covariates

Covariate Adjustment	With Covariates	p	Without Covariates	p
Overall quality of life	−4.144	< 0.001	−4.356	< 0.001
Physical well-being	−0.960	0.338	−1.129	0.258
Psychological well-being	−4.842	< 0.001	−4.994	< 0.001
Social well-being	−2.900	0.004	−2.974	0.003
Spiritual well-being	−0.652	0.514	−0.704	0.482

Note. All p values are two-sided.

routines, processes, and systems so that patients move from treatment to survivorship without being “lost in transition” from treatment to survivorship (Institute of Medicine & National Research Council, 2006).

From a clinical practice perspective, translation of research findings into practice can be accomplished in several venues—through established and new cancer survivorship clinics, in comprehensive breast health and breast cancer programs, and in individual practice. The study results also demonstrate that oncology nurses with their strong background in education and support are well positioned to lead the translation of research findings into practice.

If patients are to be provided safe passage from treatment to survivorship, oncology nurses will be very prominent, if not central, figures, in providing that conduit as well as the support and access to resources after treatment ends. The present study underscores the value and importance of that role.

Author Contact: Karen Dow Meneses, PhD, RN, FAAN, can be reached at menesesk@uab.edu, with copy to editor at ONFEditor@ons.org.

References

- Armer, J., Fu, M.R., Wainstock, J.M., Zagar, E., & Jacobs, L.K. (2004). Lymphedema following breast cancer treatment, including sentinel lymph node biopsy. *Lymphology*, 37(2), 73–91.
- Armer, J.M. (2005). The problem of post-breast cancer lymphedema: Impact and measurement issues. *Cancer Investigation*, 23, 76–83.
- Armer, J.M., & Heckathorn, P.W. (2005). Post-breast cancer lymphedema in aging women: Self-management and implications for nursing. *Journal of Gerontological Nursing*, 31(5), 29–39.
- Ashbury, F.D., Cameron, C., Mercer, S.L., Fitch, M., & Nielsen, E. (1998). One-on-one peer support and quality of life for breast cancer patients. *Patient Education and Counseling*, 35(2), 89–100.
- 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.
- Avis, N.E., Crawford, S., & Manuel, J. (2005). Quality of life among younger women with breast cancer. *Journal of Clinical Oncology*, 23, 3322–3330.
- Badger, T., Segrin, C., Meek, P., Lopez, A.M., & Bonham, E. (2004). A case study of telephone interpersonal counseling for women with breast cancer and their partners. *Oncology Nursing Forum*, 31, 997–1003.
- Barton, D., & Loprinzi, C. (2002). Novel approaches to preventing chemotherapy-induced cognitive dysfunction in breast cancer: The art of the possible. *Clinics in Breast Cancer*, 3(Suppl. 3), S121–S127.
- Barton, D.L., Loprinzi, C.L., Novotny, P., Shanafelt, T., Sloan, J., Wahner-Roedler, D., et al. (2003). Pilot evaluation of citalopram for the relief of hot flashes. *Journal of Supportive Oncology*, 1(1), 47–51.
- Bauer-Wu, S., & Farran, C.J. (2005). Meaning in life and psycho-spiritual functioning: A comparison of breast cancer survivors and healthy women. *Journal of Holistic Nursing*, 23, 172–190.
- Bednarek, H.L., & Bradley, C.J. (2005). Work and retirement after cancer diagnosis. *Research in Nursing and Health*, 28, 126–135.
- Bellg, A.J., Borrelli, B., Resnick, B., Hecht, J., Minicucci, D.S., Ory, M., et al. (2004). Enhancing treatment fidelity in health behavior change studies: Best practices and recommendations from the NIH Behavior Change Consortium. *Health Psychology*, 23, 443–451.
- Bellizzi, K.M., & Blank, T.O. (2006). Predicting posttraumatic growth in breast cancer survivors. *Health Psychology*, 25(1), 47–56.
- Bender, C.M., Sereika, S.M., Berga, S.L., Vogel, V.G., Brufsky, A.M., Paraske, K.K., et al. (2006). Cognitive impairment associated with adjuvant therapy in breast cancer. *Psycho-Oncology*, 15, 422–430.
- Berger, A.M., VonEssen, S., Kuhn, B.R., Piper, B.F., Agrawal, S., Lynch, J.C., et al. (2003). Adherence, sleep, and fatigue outcomes after adjuvant breast cancer chemotherapy: Results of a feasibility intervention study. *Oncology Nursing Forum*, 30, 513–522.
- Berger, A.M., VonEssen, S., Kuhn, B.R., Piper, B.F., Farr, L., Agrawal, S., et al. (2002). Feasibility of a sleep intervention during adjuvant breast cancer chemotherapy. *Oncology Nursing Forum*, 29, 1431–1441.
- Bower, J.E., Ganz, P.A., Desmond, K.A., Bernards, C., Rowland, J.H., Meyerowitz, B.E., et al. (2006). Fatigue in long-term breast carcinoma survivors: A longitudinal investigation. *Cancer*, 106, 751–758.
- Braden, C.J., Mishel, M.H., & Longman, A.J. (1998). Self-help intervention project: Women receiving breast cancer treatment. *Cancer Practice*, 6, 87–98.
- Carpenter, J.S., & Andrykowski, M.A. (1999). Menopausal symptoms in breast cancer survivors. *Oncology Nursing Forum*, 26, 1311–1317.
- Carpenter, J.S., Elam, J.L., Ridner, S.H., Carney, P.H., Cherry, G.J., & Cucullu, H.L. (2004). Sleep, fatigue, and depressive symptoms in breast cancer survivors and matched healthy women experiencing hot flashes. *Oncology Nursing Forum*, 31, 591–598.
- Carpenter, J.S., Storniolo, A.M., Johns, S., Monahan, P.O., Azzouz, F., Elam, J.L., et al. (2007). Randomized, double-blind, placebo-controlled crossover trials of venlafaxine for hot flashes after breast cancer. *Oncologist*, 12, 124–135.
- Casso, D., Buist, D.S., & Taplin, S. (2004). Quality of life of 5–10 year breast cancer survivors diagnosed between age 40 and 49. *Health and Quality of Life Outcomes*, 2, 25.
- Chamberlain-Wilmoth, M., Tulman, L., Coleman, E.A., Stewart, C.B., & Samarel, N. (2006). Women’s perceptions of the effectiveness of telephone support and education on their adjustment to breast cancer. *Oncology Nursing Forum*, 33, 138–144.
- Cimprich, B., Janz, N.K., Northouse, L., Wren, P.A., Given, B., & Given, C.W. (2005). Taking CHARGE: A self-management program for women following breast cancer treatment. *Psycho-Oncology*, 14, 704–717.
- Cimprich, B., & Ronis, D.L. (2003). An environmental intervention to restore attention in women with newly diagnosed breast cancer. *Cancer Nursing*, 26, 284–292.
- Cimprich, B., So, H., Ronis, D.L., & Trask, C. (2005). Pre-treatment factors related to cognitive functioning in women newly diagnosed with breast cancer. *Psycho-Oncology*, 14, 70–78.
- Coleman, E.A., Tulman, L., Samarel, N., Wilmoth, M.C., Rickel, L., Rickel, M., et al. (2005). The effect of telephone social support and education on adaptation to breast cancer during the year following diagnosis. *Oncology Nursing Forum*, 32, 822–829.
- Courneya, K.S., Blanchard, C.M., & Laing, D.M. (2001). Exercise adherence in breast cancer survivors training for a dragon boat race competition: A preliminary investigation. *Psycho-Oncology*, 10, 444–452.
- Dirksen, S.R., & Erickson, J.R. (2002). Well-being in Hispanic and non-

- Hispanic white survivors of breast cancer. *Oncology Nursing Forum*, 29, 820–826.
- Dow, K.H., Ferrell, B.R., Haberman, M.R., & Eaton, L. (1999). The meaning of quality of life in cancer survivorship. *Oncology Nursing Forum*, 26, 519–528.
- Dow, K.H., Ferrell, B.R., Leigh, S., Ly, J., & Gulasekaram, P. (1996). An evaluation of the quality of life among long-term survivors of breast cancer. *Breast Cancer Research and Treatment*, 39, 261–273.
- Ferrans, C.E. (1994). Quality of life through the eyes of survivors of breast cancer. *Oncology Nursing Forum*, 21, 1645–1651.
- Ferrell, B.R., Dow, K.H., & Grant, M. (1995). Measurement of the quality of life of cancer survivors. *Quality of Life Research*, 4, 523–531.
- Fogel, J., Albert, S.M., Schnabel, F., Ditkoff, B.A., & Neugut, A.I. (2002). Internet use and social support in women with breast cancer. *Health Psychology*, 21, 398–404.
- Giedzinska, A.S., Meyerowitz, B.E., Ganz, P.A., & Rowland, J.H. (2004). Health-related quality of life in a multiethnic sample of breast cancer survivors. *Annals of Behavioral Medicine*, 28, 39–51.
- Gotay, C.C., & Muraoka, M.Y. (1998). Quality of life in long-term survivors of adult-onset cancers. *Journal of the National Cancer Institute*, 90, 656–667.
- Gustafson, D.H., McTavish, F.M., Stengle, W., Ballard, D., Hawkins, R., Shaw, B.R., et al. (2005). Use and impact of eHealth System by low-income women with breast cancer. *Journal of Health Communication*, 10(Suppl. 1), 195–218.
- Heidrich, S.M., Egan, J.J., Hengudomsb, P., & Randolph, S.M. (2006). Symptoms, symptom beliefs, and quality of life of older breast cancer survivors: A comparative study. *Oncology Nursing Forum*, 33, 315–322.
- Helgeson, V.S., Cohen, S., Schulz, R., & Yasko, J. (2001). Long-term effects of educational and peer discussion group interventions on adjustment to breast cancer. *Health Psychology*, 20, 387–392.
- Holzner, B., Kemmler, G., Kopp, M., Moschen, R., Schweigkofler, H., Dunser, M., et al. (2001). Quality of life in breast cancer patients—Not enough attention for long-term survivors? *Psychosomatics*, 42, 117–123.
- Hosaka, T., Sugiyama, Y., Hirai, K., Okuyama, T., Sugawara, Y., & Nakamura, Y. (2001). Effects of a modified group intervention with early-stage breast cancer patients. *General Hospital Psychiatry*, 23, 145–151.
- Hoskins, C.N., Haber, J., Budin, W.C., Cartwright-Alcares, F., Kowalski, M.O., Panke, J., et al. (2001). Breast cancer: Education, counseling, and adjustment—A pilot study. *Psychological Reports*, 89, 677–704.
- Institute of Medicine & National Research Council. (2004). *Meeting the psychosocial needs of women with breast cancer* (vol. 2005). Washington, DC: National Academies Press.
- Institute of Medicine & National Research Council. (2006). *From cancer patient to cancer survivor: Lost in transition*. Washington, DC: National Academies Press.
- King, M.T., Kenny, P., Shiell, A., Hall, J., & Boyages, J. (2000). Quality of life three months and one year after first treatment for early stage breast cancer: Influence of treatment and patient characteristics. *Quality of Life Research*, 9, 789–800.
- Kinney, C.K., Rodgers, D.M., Nash, K.A., & Bray, C.O. (2003). Holistic healing for women with breast cancer through a mind, body, and spirit self-empowerment program. *Journal of Holistic Nursing*, 21, 260–279.
- Knobf, M.T. (2002). Carrying on: The experience of premature menopause in women with early stage breast cancer. *Nursing Research*, 51, 9–17.
- Kurtz, M.E., Wyatt, G., & Kurtz, J.C. (1995). Psychological and sexual well-being, philosophical/spiritual views, and health habits of long-term cancer survivors. *Health Care for Women International*, 16, 253–262.
- Lewis, F.M., Casey, S.M., Brandt, P.A., Shands, M.E., & Zahlis, E.H. (2006). The enhancing connections program: Pilot study of a cognitive-behavioral intervention for mothers and children affected by breast cancer. *Psycho-Oncology*, 15, 486–497.
- Lewis, F.M., & Deal, L.W. (1995). Balancing our lives: A study of the married couple's experience with breast cancer recurrence. *Oncology Nursing Forum*, 22, 943–953.
- Lewis, J.A., Manne, S.L., DuHamel, K.N., Vickburg, S.M., Bovbjerg, D.H., Currie, V., et al. (2001). Social support, intrusive thoughts, and quality of life in breast cancer survivors. *Journal of Behavioral Medicine*, 24, 231–245.
- Liang, K.Y., & Zeger, S.L. (1986). Longitudinal data analysis using generalized linear models. *Biometrika*, 73, 13–22.
- Loerzel, V.W., Dow, K.H., & McNees, P. (2006, February). *Why women with breast cancer use or don't use lymphedema prevention and management strategies*. Presented at the American Psychosocial Oncology Society Third Annual Conference, Amelia Island, FL.
- Marcus, A.C., Garrett, K.M., Cella, D., Wenzel, L.B., Brady, M.J., Crane, L.A., et al. (1998). Telephone counseling of breast cancer patients after treatment: A description of a randomized clinical trial. *Psycho-Oncology*, 7, 470–482.
- Mast, M.E. (1998). Survivors of breast cancer: Illness uncertainty, positive reappraisal, and emotional distress. *Oncology Nursing Forum*, 25, 555–562.
- Mellon, S. (2002). Comparisons between cancer survivors and family members on meaning of the illness and family quality of life. *Oncology Nursing Forum*, 29, 1117–1125.
- Meneses, K. (in review). Breast cancer research by oncology nurse scientists. In C.R. King & J. Mitchell-Phillips (Eds.), *Advancing oncology nursing science*. Pittsburgh, PA: Oncology Nursing Society.
- Meneses, K., & McNees, P. (in press). Transdisciplinary integration of electronic communication technology and nursing research. *Nursing Outlook*.
- Meraviglia, M. (2006). Effects of spirituality in breast cancer survivors [Online exclusive]. *Oncology Nursing Forum*, 33, E1–E7. Retrieved July 26, 2007, from <http://www.ons.org/publications/journals/ONF/volume33/issue1/pdf/330137.pdf>
- Mishel, M.H., Germino, B.B., Gil, K.M., Belyea, M., Laney, I.C., Stewart, J., et al. (2005). Benefits from an uncertainty management intervention for African-American and Caucasian older long-term breast cancer survivors. *Psycho-Oncology*, 14, 962–978.
- Miyashita, M. (2005). A randomized intervention study for breast cancer survivors in Japan: Effects of short-term support group focused on possible breast cancer recurrence. *Cancer Nursing*, 28, 70–78.
- Mock, V., Frangakis, C., Davidson, N.E., Ropka, M.E., Pickett, M., Poniatowski, B., et al. (2005). Exercise manages fatigue during breast cancer treatment: A randomized controlled trial. *Psycho-Oncology*, 14, 464–477.
- National Cancer Institute. (2006). About cancer survivorship research: Survivorship definitions. Retrieved February 16, 2007, from <http://dceps.nct.nih.gov/ocs/definitions.html>
- Northouse, L., Kershaw, T., Mood, D., & Schafenacker, A. (2005). Effects of a family intervention on the quality of life of women with recurrent breast cancer and their family caregivers. *Psycho-Oncology*, 14, 478–491.
- Northouse, L.L., Mood, D., Kershaw, T., Schafenacker, A., Mellon, S., Walker, J., et al. (2002). Quality of life of women with recurrent breast cancer and their family members. *Journal of Clinical Oncology*, 20, 4050–4064.
- Payne, J., Piper, B., Rabinowitz, I., & Zimmerman, B. (2006). Biomarkers, fatigue, sleep, and depressive symptoms in women with breast cancer: A pilot study. *Oncology Nursing Forum*, 33, 775–783.
- Rawl, S.M., Given, B.A., Given, C.W., Champion, V.L., Kozachik, S.L., Kozachik, S.L., et al. (2002). Intervention to improve psychological functioning for newly diagnosed patients with cancer. *Oncology Nursing Forum*, 29, 967–975.
- R Development Core Team. (2006). A language and environment for statistical computing: Reference index (version 2.3.1). Retrieved July 25, 2007, from <http://cran.r-project.org/doc/manuals/fullrefman.pdf>
- Resnick, B., Bell, A.J., Borrelli, B., Defrancesco, C., Breger, R., Hecht, J., et al. (2005). Examples of implementation and evaluation of treatment fidelity in the BCC studies: Where we are and where we need to go. *Annals of Behavioral Medicine*, 29(Suppl.), 46–54.
- Resnick, B., Inguito, P., Orwig, D., Yahiro, J.Y., Hawkes, W., Werner, M., et al. (2005). Treatment fidelity in behavior change research: A case example. *Nursing Research*, 54, 139–143.
- Sandgren, A.K., & McCaul, K.D. (2006). Long-term telephone therapy outcomes for breast cancer patients. *Psycho-Oncology*, 16, 38–47.
- Santacroce, S.J., Maccarelli, L.M., & Grey, M. (2004). Intervention fidelity. *Nursing Research*, 53, 63–66.
- Scheier, M.F., Helgeson, V.S., Schulz, R., Colvin, S., Berga, S., Bridges, M.W., et al. (2005). Interventions to enhance physical and psychological functioning among younger women who are ending nonhormonal adjuvant

- treatment for early-stage breast cancer. *Journal of Clinical Oncology*, 23, 4298–4311.
- Stanton, A.L., Ganz, P.A., Kwan, L., Meyerowitz, B.E., Bower, J.E., Krupnick, J.L., et al. (2005). Outcomes from the Moving Beyond Cancer psychoeducational, randomized, controlled trial with breast cancer patients. *Journal of Clinical Oncology*, 23, 6009–6018.
- Stewart, D.E., Cheung, A.M., Duff, S., Wong, F., McQuestion, M., Cheng, T., et al. (2001). Long-term breast cancer survivors: Confidentiality, disclosure, effects on work and insurance. *Psycho-Oncology*, 10, 259–263.
- Vacek, P.M., Winstead-Fry, P., Secker-Walker, R.H., Hooper, G.J., & Plante, D.A. (2003). Factors influencing quality of life in breast cancer survivors. *Quality of Life Research*, 12, 527–537.
- Waltman, N.L., Twiss, J.J., Ott, C.D., Gross, G.J., Lindsey, A.M., Moore, T.E., et al. (2003). Testing an intervention for preventing osteoporosis in postmenopausal breast cancer survivors. *Journal of Nursing Scholarship*, 35, 333–338.
- Wonghongkul, T., Dechaprom, N., Phumivichuvate, L., & Losawatkul, S. (2006). Uncertainty appraisal coping and quality of life in breast cancer survivors. *Cancer Nursing*, 29, 250–257.
- Wyatt, G., Kurtz, M.E., & Liken, M. (1993). Breast cancer survivors: An exploration of quality of life issues. *Cancer Nursing*, 16, 440–448.
- Yates, P., Aranda, S., Hargraves, M., Mirolo, B., Clavarino, A., McLachlan, S., et al. (2005). Randomized controlled trial of an educational intervention for managing fatigue in women receiving adjuvant chemotherapy for early-stage breast cancer. *Journal of Clinical Oncology*, 23, 6027–6036.

SINGAPORE

Call For Abstracts

15th International Conference on Cancer Nursing August 17 to 21, 2008

The International Society of Nurses in Cancer Care (ISNCC) and SingHealth invite you to participate in the 15th International Conference on Cancer Nursing (ICCN) by submitting an abstract for an oral or poster presentation. The ICCN scientific program committee particularly invites abstracts related to identified conference themes and will consider all abstracts of high significance to nurses in cancer care worldwide.

**Online abstract submission is available through the
ICCN website at www.isncc.org.**

**For further information regarding the meeting,
please visit www.isncc.org.**