Anxiety and Quality of Life of Women Who Receive Radiation or Chemotherapy for Breast Cancer

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Purpose/Objectives: To examine quality of life (QOL) and anxiety in a sample of women receiving radiation or chemotherapy for breast cancer.

Design: Longitudinal, descriptive.

Setting: A cancer center in the southeastern United States.

Sample: 48 women participated; 17 received radiation and 31 received chemotherapy.

Methods: The Ferrans and Powers Quality of Life Index (QLI) and Speilberger's State-Trait Anxiety Inventory (STAI) were administered. The QLI was administered at the start of treatment and one year later. The STAI was administered at the start of treatment. The state portion of the STAI also was administered 4 weeks and 12 weeks after the start of treatment.

Main Research Variables: QOL and anxiety.

Findings: Total QOL improved significantly over time for the entire sample, as did scores on the health/functioning, psychological/spiritual, and family subscales of the QLI. No significant differences existed for total QOL or any subscales by treatment. Trait anxiety was significantly higher for women receiving chemotherapy, and state anxiety was significantly higher at all three measurement times for the women. State anxiety did not decrease significantly over the course of the treatment for either group. Trait anxiety and state anxiety at the start of treatment were significantly negatively correlated with total QLI score and the psychological/spiritual subscale. State anxiety at the start of treatment also was significantly negatively correlated with total QOL and the health/functioning and psychological/spiritual QLI subscales both at the start of treatment and one year later.

Conclusions: QOL improves over time for women who have received radiation or chemotherapy. Women receiving chemotherapy have higher anxiety scores, and higher anxiety at the start of treatment is associated with decreased QOL at the start of treatment and post-diagnosis.

Implications for Nursing: Nursing interventions to reduce anxiety at the start of treatment, especially for chemotherapy recipients, are indicated. Research also should target methods to reduce anxiety at the start of treatment.

Key Points . . .

- ➤ Quality of life (QOL) for women undergoing breast cancer treatment improves from the start of treatment to one year later.
- ➤ Women receiving chemotherapy may experience more anxiety than women receiving radiation therapy for breast cancer.
- ➤ Anxiety has a negative effect on QOL that persists over time.

Survival time for patients with breast cancer has been lengthened by new and more aggressive treatments. However, although aggressive therapy may result in a longer life, patients may experience more serious side effects than from traditional therapy and suffer from sequelae that last beyond the treatment period. A growing consensus, therefore, exists among clinicians and researchers that attention must be directed toward understanding the impact of aggressive therapy on quality of life (QOL) during the survival period (King & Hinds, 1998).

QOL is a complex, multidimensional concept that is both unique and personal. In regard to illness, QOL is affected by an individual's perceptions and responses to diagnosis. This study used Ferrans' (1990) conceptualization of QOL that states that "a person's sense of well-being stems from satisfaction or dissatisfaction with the areas of life that are most important to him/her" (p. 15). Ferrans described QOL as consisting of four domains: health/functioning, socioeconomic, psychological/spiritual, and family. Variables associated with QOL include physical symptoms and type of treatment. Physical symptoms during breast cancer treatment clearly influence QOL (Ferrell, Grant, Funk, Otis-Green, & Garcia, 1997, 1998), and the number and the severity of side effects reported have been correlated negatively with appraisal of QOL (Longman, Braden, & Mishel, 1999). In a longitudinal study of 53 women who were receiving adjuvant breast cancer

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therapy, Longman et al. found that anxiety and depression were associated negatively with QOL at the start of treatment, six to eight weeks post-treatment, and three months post-treatment. In a study of women 2–10 years post-therapy, Berglund, Bolund, Fornander, Rutqvist, and Sjoden (1991) found that women who had received chemotherapy rated their QOL as superior to those who received radiation therapy. However, Wyatt and Friedman (1998), in a study of women over 55 years of age, found no differences in QOL or demands of illness regardless of the type of therapy received (radiation, chemotherapy, or surgery alone). Thus, the effect of treatment type on QOL for breast cancer remains unclear. Predisposing factors such as socioeconomic status, personality factors such as trait anxiety, and social resources also affect the way an individual patient defines QOL during and after cancer treatment (Ferrell et al., 1997, 1998; Wyatt & Friedman).

Patients undergoing treatment for breast cancer logically can be expected to experience a decline in their perceived QOL during treatment, but whether this decrease is transitory or if long-term effects exist is not clear. Some symptoms, such as pain, may continue to negatively affect QOL (Ferrell et al., 1997). In addition, Ganz et al. (1996) found that women survivors two to three years postdiagnosis reported persistent negative effects of altered body image on QOL. Studies have shown that hormonal changes (e.g., menstrual changes), issues of fertility, decline in sexual interest, and sexual dysfunction contribute to a poor assessment of QOL by women who have undergone breast cancer therapy (Rustoen, Moum, Wiklund, & Hanestad, 1999; Wyatt & Friedman, 1998).

Hoskins (1997) found that fatigue and emotional distress were the most persistent symptoms from the start of therapy to one year later, and Graydon (1994) found that, among women who were seven weeks postradiation, greater numbers of physical symptoms were associated with decreased functioning and greater emotional distress. In a longitudinal study of 210 patients with newly diagnosed breast cancer, Ritz et al. (2000) reported that QOL improved over time, with measurements taken at 1, 3, 6, 12, and 24 months postdiagnosis, but no significant increases occurred in QOL scores between 12 and 24 months.

Thus, although previous studies indicate that QOL improves over the course of treatment, more longitudinal studies are needed for nurses to fully understand the experience and needs of women with breast cancer. This study, therefore, examines anxiety and QOL at the start of treatment and one year later in patients with breast cancer receiving radiation or chemotherapy. The study was part of a larger study of the effects of education on self-care behaviors of women with breast cancer. In the larger study, women receiving outpatient chemotherapy for newly diagnosed breast cancer were assigned randomly to receive either an audiotaped self-care education intervention or routine care. Anxiety, symptom distress, and self-care behaviors were the dependent measures. For the study reported here, none of the women received the self-care education intervention.

Methods

Sample

A convenience sample of 48 women who were receiving either chemotherapy or radiation therapy for early-stage breast cancer was recruited from a cancer center in the southeastern United States. Criteria included patients who were aged 18 or older; English speaking; capable of hearing normal conversation; oriented to time, place, and person; newly diagnosed with breast cancer; and living in a community setting. In addition, all subjects had a Karnofsky rating greater than 70%.

Consent for the study was obtained from the university's institutional review board. Names of women who were newly diagnosed with breast cancer and scheduled for either chemotherapy or radiation therapy were obtained through tumor board rounds and clinical nursing staff. Investigators contacted potential subjects by telephone prior to their first treatment. The study was explained to each woman, and if a woman agreed to participate, an appointment time for a phone interview was scheduled. Trained undergraduate and graduate nursing students conducted all telephone interviews.

Procedures

Subjects were asked to participate in the study prior to their first therapy visit. After agreeing to participate in the study, subjects completed the study instruments and provided demographic information by telephone. Patients were tested again 4 weeks, 12 weeks, and one year later by telephone.

Instruments: The Ferrans and Powers (1985) **Quality of Life Index (QLI)** was used to measure QOL. The QLI is a two-part questionnaire that encompasses the four domains of QOL: health/functioning, socioeconomic, psychological/spiritual, and family. The QLI includes 34 questions divided in two sections. The first section measures satisfaction with each identified domain; the second section measures the perceived importance of each element of QOL. The first section responses range from "very dissatisfied" to "very satisfied" on a 6-point Likert scale. Responses in the second section range from "very important" to "very unimportant" on a 6-point Likert scale. QLI scores are calculated using a weighted scale by pairing the satisfaction response with the importance response, thus providing an individualized portrayal of QOL. Scores can range from 0–30, with higher scores indicating better QOL (Ferrans, 1990).

Criterion-related validity was determined by correlating overall scores on the QLI with those from assessment of life satisfaction. Criterion-related validity was 0.80 (Ferrans, 1990). Internal consistency, determined using Cronbach's alpha, was 0.95 for the entire instrument, 0.90 for health/functioning, 0.84 for socioeconomic, 0.93 for psychological/spiritual, and 0.66 for family (Ferrans). Test-retest reliability was demonstrated in a study comparing graduate students (n = 69) and dialysis patients (n = 20). Reliability was 0.87 over a two-week interval and 0.81 over a one-month interval (Ferrans & Powers, 1985).

Anxiety was measured using the **State-Trait Anxiety Inventory (STAI),** which consists of 40 items with 20 items each in the trait anxiety and state anxiety scales. The STAI has been used extensively to examine the role of anxiety in patients with both acute and chronic illness. Cronbach's alpha coefficients have ranged from 0.86–0.95 for the state anxiety scale and 0.89–0.90 for the trait anxiety scale (Speilberger, 1983). In this study, alpha coefficients for state anxiety prior to treatment (state 1), 4 weeks (state 2), and 12 weeks (state 3) were 0.94, 0.92, and 0.93, respectively. The alpha coefficient for trait was 0.90.

Results

Among the sample of 48 women, 31 received chemotherapy and 17 received radiation therapy, and the age range was 30–76 years with a mean of 53.65. Patients undergoing radiation therapy were significantly older ($\bar{X} = 61.47$) than patients receiving chemotherapy ($\bar{X} = 49.39$) ($t = 4.2$, $p < 0.001$), but other demographic characteristics of the treatment groups were similar. The racial distribution reflected the demographics of the region, with 24 Caucasian, 20 African American, and 2 Hispanic women. The majority of the sample reported an income of less than $30,000 per year, and the majority of the women were married. Their average educational level was one year post-high school.

Subjects' QOL scores improved over time with significant increases in total score, the health/functioning subscale, and the psychological/spiritual subscale. The family subscale scores, however, decreased significantly from the start of treatment to one year later. The socioeconomic subscale did not change significantly over time (see Table 1).

Patients receiving radiation rated their total QOL somewhat higher than patients receiving chemotherapy both at the start of treatment and at one year. However, these differences were not significant.

T tests for independent samples indicated that trait anxiety was significantly higher among women receiving chemotherapy than among women receiving radiation therapy. Also, state anxiety scores were significantly higher for women receiving chemotherapy than for women receiving radiation therapy at the start of treatment, four weeks, and eight weeks later (see Table 2). Normative state anxiety levels are 37.17 for women aged 19–39, 36.03 for women aged 40–49, and 32.2 for women aged 50–69. Normative trait anxiety levels are 36.15 for women aged 19–39, 35.03 for women aged 40–49, and 31.79 for women aged 50–69 (Speilberger, 1983). In this study, mean anxiety scores remained consistently above the norms, but this was not surprising because it is consistent with serious illness.

An analysis of covariance was run to control for the effect of age on anxiety because a significant difference existed in regard to age between the radiation and chemotherapy groups and previous literature suggests that younger women have higher levels of anxiety. When controlling for age differences, significant differences existed between the radiation and chemotherapy groups in regard to state anxiety at the start of treatment ($F = 4.22$, $p < 0.05$), at four weeks ($F = 4.96$, $p < 0.05$), and at eight weeks ($F = 4.7$, $p < 0.05$) and for trait anxiety ($F = 13.4$, $p < 0.001$).

Table 1. Paired Samples T Test: Quality of Life at Start of Treatment and One Year Later

Measurement	$\bar{X}$	t	df	p
Total quality of life 1	23.1	2.08	47	< 0.050
Total quality of life 2	23.4			
Health functioning 1	21.5	4.54	47	< 0.001
Health functioning 2	24.0			
Socioeconomic 1	22.9	1.43	47	NS
Socioeconomic 2	23.7			
Psychological/spiritual 1	24.3	2.12	46	< 0.050
Psychological/spiritual 2	25.6			
Family 1	25.8	–2.03	47	< 0.050
Family 2	24.3			

Table 2. Differences in State-Trait Anxiety for Radiation and Chemotherapy Groups

Measurement	Group	$\bar{X}$	t	df	p
Trait	Chemotherapy	46.1	4.10	47	0.001
	Radiation	35.1			
State: treatment start	Chemotherapy	46.7	2.22	47	0.040
	Radiation	37.9			
State: 4 weeks	Chemotherapy	44.9	2.33	47	0.030
	Radiation	37.5			
State: 12 weeks	Chemotherapy	46.6	2.50	47	0.023
	Radiation	38.9			

At the start of treatment, trait anxiety was correlated negatively with total QOL ($r = -0.32$, $p < 0.05$), and psychological/spiritual ($r = -0.33$, $p < 0.05$) and state anxiety were correlated negatively with total QOL ($r = -0.33$, $p < 0.05$), health/functioning ($r = -0.38$, $p < 0.001$), and psychological/spiritual ($r = -0.37$, $p < 0.001$). State anxiety at the start of treatment was correlated negatively with QOL at 12 months ($r = -0.29$, $p < 0.05$) and the subscales of health/functioning ($r= -0.38$, $p < 0.05$) and psychological/spiritual ($r = -0.39$, $p < 0.001$). Those women who scored higher on the state anxiety scale reported poorer QOL at both the start of treatment and one year postinitial treatment.

Discussion

The results of this study indicate that QOL improved from the start of treatment to one year postinitial treatment, which is consistent with other studies in which QOL improved over time for patients with breast cancer (Longman et al., 1999). This study revealed a high level of anxiety, particularly in the chemotherapy group. Because the levels of trait anxiety in this sample were high, particularly in the case of the chemotherapy recipients, it is unclear whether this particular sample is unusual. Therefore, conclusions must be made cautiously. Furthermore, the women in the study did not exhibit significant decreases in state anxiety over the course of treatment. Other studies have shown that psychological distress does not decrease over the course of treatment (Hoskins, 1997). In addition, Fallowfield, Hall, Maguire, Baum, and A'Hern (1994) reported that, at three years post-treatment, an appreciable minority of women, irrespective of treatment type, demonstrated clinically significant anxiety and depression. An important question for healthcare providers is whether this level of anxiety is clinically significant. Anxiety is known to intensify physical symptoms and, thus, influence overall QOL. Therefore, it is not surprising that, in this study, higher levels of state anxiety at the start of treatment were correlated negatively with total QLI scores and scores on the health functioning and psychological/spiritual subscales. However, because of the small sample size and the high levels of trait anxiety, more studies examining the relationship between QOL and anxiety during and following cancer therapy are needed.

Because a high level of anxiety at the start of treatment may negatively affect overall QOL, nursing measures to reduce anxiety should be implemented at the start of treatment. Research examining the effect of self-care education on anxiety, as well as other alternative coping strategies, is needed. For example, studies examining the effects of interventions such as music, massage, reflexology, and relaxation on anxiety during cancer treatment are needed. It is important that nurses conduct these studies and examine the long-term outcomes of such interventions on the QOL of cancer survivors.

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➤ Y-ME National Breast Cancer Organization
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