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Telephone Intervention and Quality of Life in Patients With Breast Cancer

KEY WORDS
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Quality of life
Telephone intervention

The aim of this quasi-experimental study was to examine the effectiveness of a telephone support intervention 1 week after surgery on the quality of life (QOL) of patients with breast cancer. The sample consisted of 228 patients with breast cancer allocated to an intervention group (n = 120) and control group (n = 108).

The data were collected using Ferrans and Powers Quality of Life Index-Cancer Version (QLI-CV) and European Organization for Research and Treatment of Cancer Quality of Life Questionnaire Breast Cancer Module (EORTC QLQ-BR23). The self-reported QOL of patients with breast cancer was considered moderately high. Statistically significant associations were found between QOL and the demographic characteristics of age, education, and employment status and of having underage children. Statistically significant associations were found between QOL and clinical characteristics such as type of surgery and axilla treatment.

The strongest predictors of poor QOL were age, control group, and type of surgery. Age was the strongest predictor of poor QOL in global QLI and in the health and functioning, socioeconomic, and family subscales. The patients' experiences show that the telephone intervention was helpful and the timing was appropriate.

The QOL in patients with breast cancer was better in subscales of body image, future perspective, and postoperative side effects. The intervention group showed significantly better body image; they worried less about the future and had less postoperative side effects than the control group did. These results may help in discussing QOL issues and should be considered when planning and implementing interventions for patients with breast cancer.

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Quality of Life in Patients With Breast Cancer

Breast cancer is the most common malignancy among women in the world.[1] In Finland, about 1 in 10 women will develop breast cancer during her lifetime.[2] Most new cases are found at those aged between 50 and 54 years.[3] A diagnosis of breast cancer and its treatment affect the physical and psychosocial well-being of women and their quality of life (QOL) in many different ways.[4–11] The present study is based on Ferrans'[12] definition of QOL, according to which QOL is a person's sense of well-being that stems from satisfaction or dissatisfaction with the areas of life that are important to him or her. Ferrans' conceptual model treats QOL as a multidimensional construct that is composed of the health and functioning domain, the socioeconomic domain, the psychological/spiritual domain, and the family domain.

Patients with breast cancer have reported the highest QOL in the family domain[6,13] and the lowest in the health and functioning domain[6] and psychological/spiritual domain.[13] Overall, the findings of earlier studies suggest that patients with breast cancer had a poorer QOL than patients with other cancer diagnoses,[6,9] especially in the psychological, sexual,[6] and emotional functioning domains.[9]

Previous studies have also reported associations between QOL and age[6–7,14]; educational level[7,14–15]; employment status[7]; problems in upper arm mobility and edema[7–8]; pain, changes in sexual functioning, fatigue, and menopausal symptoms[4]; and, furthermore, whether patients lived alone or together with another person.[6] Adequate and complete information,[16–17] communication with healthcare staff, the opportunity to express one's feelings, access to information about self-care,[16] and participation in professional-led supportive groups[17] also had a positive effect on the QOL of patients with breast cancer.

Several studies have shown that younger women with breast cancer experience significantly greater QOL disturbances than older women do.[10–11,13–14,18] In addition, the problems they face are often very different from those faced by older women: these include concerns about loss of fertility and having children and greater concerns about body image and sexuality, career, job, and financial security.[4,11,3] Women younger than 50 years are reported to be more likely to have emotional distress, breast-carcinoma–specific concerns, symptoms of depression, and disease-specific intrusive thoughts.[7,14,18] Furthermore, younger women seem to be psychologically more affected by their cancer experience,[9,18] with poorer social[7] and emotional functioning[10,18] and negative body image,[7,11,14] more pain, severe arm dysfunction,[14] more disrupted daily habits,[7] and more future health worries than older women.[10] In addition, QOL is affected by surgical treatment. Patients who had a mastectomy reported reduced sexual functioning and more difficulties in body image[10,14] than did patients who underwent breast-conserving surgery.[7] Furthermore, the extent of axilla surgery significantly contributes to arm problems: the more lymph nodes removed, the more arm side effects.[8] However, Wentzel et al[18] reported no significant age-related differences in sexual dysfunction or body image. In the studies of Engel et al,[8,10] patients without arm problems had better QOL over 5 years than those with arm problems. Women with high education and employment had better QOL compared with women who were unemployed or retired.[15]

Supportive Interventions

Patients with breast cancer and younger patients in particular have an enormous need for information and support.[9,16] Previous research has shown that there is an increased need for follow-up care after short hospitalization and has highlighted the importance of adequate communication and support to the healthcare of patients with breast cancer.[16–17] Kärki et al[19] have suggested that postoperative education in Finland is inconsistent and insufficient to provide knowledge for independent rehabilitation. Furthermore, patients described the information they received as incomprehensible and incomplete. In addition, Kerr et al[16] found that patients had significantly worse QOL when communication was unclear or unsatisfactory. Patients want to be heard, and they expect to receive more effective social support and help.[6,8,17–18] They want to express their feelings[4] and have opportunity to speak with medical staff.[16]

Support for patients with breast cancer is provided either by healthcare professionals or peers in the form of individual support and education or group support.[19–36] Most recently, patients with breast cancer have received help adapting to their disease through Web-based support groups and telephone social support and education interventions.[31] These interventions included providing support and education,[19–23,25–36] teaching coping skills, managing anxiety and stress, and discussing problems and topics that were meaningful to patients.[24] Numerous studies, reviews, and meta-analyses indicate that patients with breast cancer benefit from both group and individual therapeutic interventions,[19–36] and patients themselves have reported positive experiences of their participation in support groups.[28] The findings from the meta-analyses by Sheard and Maguire[23] support the conclusion that individual and group support are both effective in improving QOL in patients with cancer.

Several studies have shown that telephone support and education contribute to effective symptom management[29–30,33] and to improved QOL.[29] Telephone social support has been found to decrease depression,[19,30] emotional distress, tension, confusion,[30] fear, and fatigue.[29] It helps women to express their feelings, deepens their awareness of themselves, and improves women's attitudes toward their breast cancer.[28] Allard[30] found that telephone support has an effect on the home management dimension of functional status during the early postsurgical period. A conclusion of a literature review was that a telephone intervention is able to identify problems early before crises develop and can provide vital support to vulnerable patients.[31]

Helgeson et al[22] found that 8-week peer-discussion–based group intervention had no effect on psychological and physical functioning over a 3-year period, whereas 8-week educational interventions retained higher levels of vitality and physical functioning compared with the control group. One possible explanation suggested by the authors was that merely expressing feelings was not powerful enough to affect psychological or physical functioning.[23] Wilmoth et al[28] found that all the women in their experimental group who received 13 months of telephone social support and education did not benefit from the intervention because they were past the time point of needing telephone support. Sandgren and McCaul[34] reported no effect on mood disturbance or QOL for 222 women receiving structured telephone intervention after breast cancer diagnosis. On the other hand, women receiving telephone education reported greater perceived control than did those who received standard care.[34]

There remains a lack of research into telephone support for patients with breast cancer, although it is recognized that the telephone is an effective and economic method of providing support.[35] It can offer a feasible, convenient, and acceptable approach to providing more patient-centered support and information.[16,28,33] Patients themselves value the convenience and privacy of this method and the control that they retain over the length of the call.[36] The overall aim of this study was to explore the QOL of patients with breast cancer and the effect of telephone intervention on their QOL 1 week after the breast cancer surgery. Research questions in this study include the following:

1. What is the self-reported QOL in patients with breast cancer?
2. How is the self-reported QOL related to demographic and clinical variables?
3. How do patients with breast cancer perceive the telephone support they received from a physiotherapist 1 week after breast surgery?
4. What is the effect of a support and educational telephone intervention on QOL of patients with breast cancer?

■ Materials and Methods

Design and Sample

A 2-group, quasi-experimental design was chosen to test the effects of a telephone intervention on QOL of patients with breast cancer.[37] The women in intervention and control groups were quasi-randomized according to the preexisting admitting schedule, that is, the group assignment was based on the raffled order of the questionnaires. Women who got odd numbers were assigned to the intervention group, and women who got even numbers were assigned to the control group.

This study was conducted between 2004 and 2007 in the Department of Oncology at the Tampere University Hospital and in the Department of Surgery at Tampere Health Centre Hospital in Finland. The total sample consisted of all the women who were operated on for breast cancer and who completed the study's informed consent documents. The inclusion criteria for participation were the following: female, aged 18 to 75 years, newly diagnosed and having surgery for breast cancer, and had sufficient knowledge of Finnish to be able to complete the study questionnaires. Patients with a previous breast cancer surgery were excluded from our study.

Procedure

The study protocol was approved by the ethics committee of the Tampere University Hospital. Trained nurses recruited eligible women while they were in the hospital after their breast cancer surgery. After the nurses explained the study purpose and data collection methods, the women were given the informed consent documents to sign. Nurses then handed the study questionnaires to the women, with instructions to complete the questionnaires at home and then mail them to the first investigator (P.S.) within 2 weeks. A letter enclosed with the questionnaires contained study information and assurances of confidentiality and the voluntary nature of study participation. All data were anonymous. No blinding was used, but at the time of consent, neither the nurse nor the consenting women knew to which group each woman would be assigned.

Intervention

The intervention consisted of social support provided by a physiotherapist via a single telephone contact 1 week after surgery, before any adjuvant therapy. In Finland, physiotherapists are hired by the hospital and are involved in the direct care of patients in certain departments. In this study, 2 physiotherapists (one from each study setting) who were primarily responsible for providing the telephone intervention specialized in the physiotherapy of breast cancer surgery patients. When these 2 physiotherapists were absent, their substitute physiotherapists called the patients. All the physiotherapists were trained by the first investigator for this study to provide the telephone intervention and were urged to contact the researcher in case they have questions concerning the content of the intervention. The physiotherapist who counseled the patient during the hospitalization was the same person who called the patient (if assigned to the intervention group) 1 week after surgery. The physiotherapist attempted by telephone to reach the intervention patients at least 3 times. The length of time for each phone call intervention varied from 3 to 25 minutes according to the need of the individual patient. The content of the intervention was designed on the basis of Sluijs'[38] themes from patient education in physical therapy. Themes were (1) teaching and providing information about illness, (2) giving instructions for home exercises, (3) giving advice and information, (4) giving general health education, (5) counseling on stress-related problems, (6) concentrating on therapist-patient relationship, (7) focusing on planned and systematic approach (eg, explaining the aim of exercise), and (8) exploring patients demands and expectations. The objectives of the intervention were to (1) offer concrete support and counseling in physical functioning and to provide guidance about how to use the upper limb, (2) provide an opportunity for patients to talk about their feelings, (3) give patients a chance to ask questions about matters bothering them, and (4) provide information about rehabilitation and support groups in the area. However, the content of the intervention was individually tailored based on the concerns that the women wanted to discuss. The most frequent concerns were how to continue life after surgery, how to handle breast-surgery–induced problems such as pain, and how to use the upper arm after surgery. In addition, women told about positive events in their lives, that is, how the support and information provided by physiotherapist helped them to survive at home after surgery. No limit was set to the length of the telephone contact. Both the intervention and control groups received the standard verbal and written education in the hospital about how to increase shoulder function and upper arm mobility and how to avoid upper limb edema. However, the control group did not get any telephone support and education.

Measures

RESPONSE

Quality of life was measured using Ferrans and Powers Quality of Life Index-Cancer Version (QLI-CV) and the European Organisation for Research and Treatment of Cancer (EORTC) Quality of Life Questionnaire Breast Cancer Module (QLQ-BR23). Quality of Life Index-Cancer Version is a self-administered measure of QOL that consists of 2 parts. The first measures satisfaction with various domains of life, and the second measures the importance of those domains to the subject. Items are rated on a 6-point Likert scale, ranging from "very dissatisfied" to "very satisfied" for the satisfaction items and "very unimportant" to "very important" for the importance items. The QLI-CV contains 4 subscales: health and functioning, socioeconomic, psychological/spiritual, and family. The QLI-CV is scored by weighing each satisfaction response with its corresponding importance response. Scores can range from 0 to 30 for total scores and each subscale score. Higher scores denote greater perceived QOL.[12] The Ferrans and Powers English-language version was translated into Finnish by using back translation with the permission of C.E. Ferrans.

The QLQ-BR23 module consists of 23 items, which are rated on a 4-point rating scale ranging from "not at all" to "very much." Items assess therapy side effects, arm symptoms, breast symptoms, body image, and sexual functioning, and single items assess sexual enjoyment, upset about hair loss, and a future perspective. The timeframe for all scales of the questionnaire was the patient's past week except for items related to sexual activity wherein a 4-week timeframe was applied. Both of these measurement tools are internationally known, validated, and used with patients with breast cancer.[6,12,39–40] Permission to use the Finnish version of QLQ-BR23 was obtained from the EORTC Quality of Life Group.

PREDICTORS

Background variables. Demographic background characteristics included age, educational level, and employment status and having/not having underage children. Age was divided into 2 appropriate groups such as younger than 55 years and at least 55 years (older). The age group was based on the menopausal status where women younger than 55 years presumably were premenopausal and women 55 years and older were postmenopausal. Data on clinical characteristics such as menopausal status, tumor size and histology, stage of disease, and surgical procedure were collected from patient files by the first author and supervised by the third author.

Perception of the telephone intervention. The scale used here was originally developed by Kaunonen[41] in a study of grieving family members. It was revised and tested for this study by the first investigator and included both close- and open-ended questions. Patients were asked if the timing of the call was appropriate (yes or no) and whether they thought it was worthwhile continuing the intervention (yes or no). In addition, the scale included 1 item about the usefulness of the telephone call (1 = very useless to 5 = very useful) and 6 items of whether the support was beneficial. The responses to the 6 items that were used to measure how helpful was the telephone call ranged from 1 = did not help to 5 = helped very much. One open-ended question asked what would be the most appropriate timing for support given via telephone.

Statistical Analysis

Statistical analysis was carried out using the SPSS (SPSS Inc, Chicago, Illinois) for Windows 15.0.1. Statistical differences with a P value of less than .05 were considered significant. The QLQ-BR23 items were scored in accordance with the EORTC manual.[42] After scoring, all scale and single-item scores were linearly transformed to a 0- to 100-point scale. Group differences in scores for the QLQ-BR23 questionnaire were interpreted for clinical relevance according to Osoba et al[43] on a 100-point scale (small = 5–10 points, moderate = 11–19 points, and large ≥20 points).

Descriptive statistics were used to characterize the sample demographic profile (age, education, employment status, underage children, menopausal status) and clinical variables (diameter of tumor, multifocal tumor, histological type, grade, metastases, estrogen receptors, progesterone receptors, type of surgery, and axilla treatment). Differences between the characteristics of the intervention and control groups were determined with Pearson χ test and with Fisher exact test. In addition, the experiences on telephone support and QOL were illustrated by means of standard deviations and by medians with interquartile ranges. Group differences in QOL scores between the intervention and control groups were explored using the nonparametric Mann-Whitney *U* test. The association of the categorical background variables (ie, age, education, employment status, underage children, menopausal status, diameter of tumor, multifocal tumor, histological type, grade, metastases, estrogen receptors, progesterone receptors, type of surgery, and axilla treatment) with non-Gaussian continuous QOL scores was analyzed using the Mann-Whitney *U* test and Kruskall-Wallis test.

Logistic regression models were used to identify the lowest quartile of QOL scores.[44] Models were adjusted for intervention and control group, age (younger than 55 years vs at least 55 years), education (employed vs retired), underage children (no vs yes), menopausal status (premenopausal vs postmenopausal), diameter of tumor (T1, T2, or T3), multifocal tumor (no vs yes), histological type (ductal, lobular, or other carcinoma), grade (I, II, or III), metastases (none vs regional), estrogen receptors (positive vs negative), progesterone receptors (positive vs negative), type of surgery (breast conserving vs total mastectomy), and finally axilla treatment (axilla dissection vs sentinel node). Results were reported by odds ratios (OR) with 95% confidence intervals (95% CI).

Results

Characteristics of the Intervention and Control Groups

Of 359 women contacted, 250 (70%) agreed to participate and completed the informed consent process; 142 women were assigned to the intervention group. Physiotherapists were unable to reach 12 of the consenting women even after 3 telephone calls, and 10 additional women refused to participate. The final intervention group consisted of 120 women, and the control group consisted of 108 women. The women in the intervention group ranged in age from 31 to 75 years (mean, 57 years), and in the control group, from 24 to 75 years (mean, 56 years). Most women were older than 55 years, had a professional education, were employed, and had no underage children. There were no statistically significant differences between the intervention and control group in terms of their demographic and in clinical characteristics (Table 1).

QOL in the Intervention and Control Groups

The median global score for QLI-CV was very similar in both groups. In the intervention group, the median global QLI-CV score was 22.9 (mean [SD], 21.9 [4.0]) and in the control group, 21.7 (mean [SD], 21.6 [3.9]). The global QLI-CV mean scores ranged from 7.5 to 28.4 in the intervention group and 6.9 to 29.2 in the control group. Patients in both groups reported the highest QOL in the

Table 1 • Demographic and Clinical Characteristic of Participants

	Intervention Group (n = 120)		Control Group (n = 108)		
	n	%	n	%	*P*
Age, y					.799
<55	48	40.0	45	41.7	
≥55	72	60.0	63	58.3	
Education					.842
No professional education	38	31.7	34	31.5	
Professional education	61	50.8	58	53.7	
Academic education	21	17.5	16	14.8	
Employment status					.819
Employed	85	70.8	75	69.4	
Retired	35	29.2	33	30.6	
Underage children					.376
Yes	24	20.0	16	14.8	
No	93	77.5	91	84.3	
Unknown	3	2.5	1	0.9	
Menopausal status					.638
Premenopausal	31	25.8	25	23.1	
Postmenopausal	89	74.2	83	76.9	
The diameter of the tumor					
T1 (<2 cm)	75	62.5	79	74.5	.277
T2 (2-5 cm)	35	29.2	22	20.8	
T3 (>5 cm)	7	5.8	4	3.8	
T4	3	2.5	1	0.9	
Unknown	0	0.0	2	1.9	
Multifocal tumor					.586
Yes	20	16.7	21	19.4	
No	100	83.3	87	80.6	
Histological type					
Ductal carcinoma	100	83.3	84	77.8	.557
Lobular carcinoma	16	13.3	19	17.6	
Other	4	3.3	5	4.6	
Grade					
I	24	20.0	24	22.2	.447
II	52	43.3	52	48.1	
III	44	37.0	31	28.7	
Unknown	0	0.0	1	0.9	
Metastases					.403
None	75	62.5	74	68.5	
Regional	45	37.5	34	31.5	
Distant	1	0.8	2	1.9	
Estrogen receptors					.540
Positive	88	73.3	83	76.9	
Negative	32	26.7	25	23.1	
Progesterone receptors					0.977
Positive	78	65.0	70	64.8	
Negative	42	35.0	38	35.8	
Type of surgery					.418
Breast conserving	58	48.3	58	53.7	
Total mastectomy	62	51.7	50	46.3	
Axilla treatment					.465
Axilla dissection	65	54.6	53	49.1	
Sentinel node	54	45.4	55	50.9	
None	1	0.8	0	0.0	

Table 2 • The Median Scores (Md), the Mean Scores (M), SDs, and Ranges of QLI-CV Subscale Distributions

	Intervention Group (n = 120)				Control Group (n = 108)				
QLI subscales	M	SD	Md	Range	M	SD	Md	Range	*P*
QLI-CV									
Health/functioning	20.2	7.6	21.2	7.6–28.3	19.7	4.6	20.3	6.6–28.1	.319
Socioeconomic	23.5	4.2	24.0	7.2–30.0	23.1	3.9	23.5	12.0–30.0	.267
Psychological/spiritual	21.4	4.7	22.3	7.1–29.3	21.0	4.7	21.4	7.1–29.3	.892
Family	25.2	4.4	26.4	8.9–30.0	25.2	4.2	26.0	2.3–30.0	.331
QLI-CV global score	21.9	4.0	22.9	7.5–28.4	21.6	3.9	21.7	6.9–29.2	.426

Abbreviation: QLI-CV, Quality of Life Index-Cancer Version.
Differences between groups were tested by Mann-Whitney *U* test.

family domain and the lowest in the health and functioning domain (Table 2).

Factors Related to QOL

Tables 3 and 4 show the associations of individual variables with QOL. A positive statistical association between groups was found between age and QLI (*P* = .037) and between age and socioeconomic subscale of QLI (*P* = .009), indicating that patients aged 55 years or older reported a higher QOL than younger age group did. Measured by QLQ-BR23, women younger than 55 years had significantly poorer body image (*P* = .003), and they had significantly more breast symptoms (*P* < .001) and arm symptoms (*P* = .001) than women older than 55 years. Women with a professional education had poorer QLI in the family subscale (*P* = .015) and more breast (*P* = .027) and arm symptoms (*P* = .006) than women with no professional education or with an academic education. Employed women had better sexual functioning (*P* = .001) but poorer socioeconomic QLI (*P* = .026), more breast symptoms (*P* = .030), and more arm symptoms (*P* = .024) than retired women. Women who did not have underage children had significantly less arm symptoms (*P* = .037) than women who had underage children.

Furthermore, statistical differences were found between menopausal status and body image (*P* = .006), sexual functioning (*P* = .001), breast symptoms (*P* = .048), and arm symptoms (*P* = .012). Premenopausal women had lower body image and sexual functioning scores, and they suffered more from breast and arm symptoms than did postmenopausal women. Women who had a multifocal tumor had significantly worse global QLI (*P* = .020), health and functioning (*P* = .018), socioeconomic status (*P* = .046), and body image (*P* = .002) compared with women who did not have multifocal tumor. Women with lobular carcinoma had more breast symptoms (*P* = .016) than women with ductal carcinoma or other. Furthermore, women with metastatic breast cancer had significantly worse health and functioning (*P* = .018) and body image (*P* = .005), and they had more arm symptoms (*P* < .001) than women with nonmetastatic breast cancer. Women with positive estrogen receptor status had more arm symptoms than women with negative estrogen receptor status (*P* = .024).

Type of surgery was significantly associated with global QLI (*P* = .018) and family subscale (*P* = .017). Women who underwent mastectomy had worse global QLI and poorer QOL in the family domain compared with women with breast-conserving therapy. Women who underwent axilla dissection had poorer global QLI (*P* = .018) and QOL in the health and functioning subscale (*P* = .005). Patients who had underwent mastectomy had a significantly (*P* < .001) poorer body image, and they had significantly (*P* = .033) more arm symptoms than patients with breast-conserving therapy. Similarly, women with axilla dissection had a poorer body image (*P* < .001) and more arm symptoms (*P* < .000) than women without axilla dissection. Grade and positive or negative progesterone receptors showed no association with QOL.

Factors Related to Poor QOL

Tables 5 and 6 show the associations of individual variables with poor QOL according to the logistic regression model. The lowest quartile of the QLI-CV global scores was influenced by being younger than 55 years (OR, 2.92; 95% CI = 1.06–8.05; Wald statistic, 4.27; *P* = .039) and by histological type with lobular carcinoma having lower odds (OR, 0.22; 95% CI, 0.06–0.83; Wald statistic, 4.99; *P* = .025). In addition, demographic and clinical characteristics explained 13.8% of the total variance of the lowest quartile of the QLI-CV global score by Nagelkerke *R*. Women younger than 55 years had poorer health and functioning compared with women who were at least 55 years old (OR, 3.08; 95% CI, 1.14–6.34; Wald statistic, 4.91; *P* = .027; Nagelkerke *R*, 0.175). Poor socioeconomic domain scores were influenced by being younger than 55 years (OR, 3.04; 95% CI, 1.12–8.25; Wald statistic, 4.74; *P* = .029; R^2, 0.172). The lowest quartile of psychological and spiritual domain scores (R^2, 0.171) was associated with women who had less professional education than those who had academic education (OR, 2.66; 95% CI, 0.84–8.55; Wald statistic, 2.792; *P* = .095). Being younger than 55 years also helped to explain low family domain scores (OR, 2.81; 95% CI, 1.03–7.66; Wald statistic, 4.06; *P* = .044; R^2, 0.151).

Table 3 • Factors Associated With Sum Variables for Quality of Life Index-Cancer Version

	Global QLI			Health/ Functioning			Socioeconomic			Psychological/ Spiritual			Family		
Factor	Md	IQ	*P*	Md	IQ	*P*	Md	IQ	*P*	Md	IQ	*P*	Md	IQ	*P*
Age, y			.037			.065			.009			.062			.373
<55	21.2	18–25		19.5	15–23		22.8	20–26		21.3	17–24		26.1	23–29	
≥55	22.9	20–25		20.8	18–24		24.3	22–26		22.1	20–25		26.4	24–29	
Education			.083			.214			.108			.152			.015
No professional education	23.0	20–25		21.7	17–24		23.9	21–26		21.9	20–25		27.6	24–29	
Professional education	21.4	19–24		20.3	16–23		23.2	20–26		21.3	17–24		25.3	23–28	
Academic education	23.1	20–26		20.4	17–24		24.7	23–28		22.3	20–25		25.8	23–28	
Employment status			.291			.411			.026			.286			.635
Employed	22.1	19–25		20.5	16–24		23.5	20–26		21.7	18–24		26.4	23–29	
Retired	23.0	20–25		20.7	17–24		24.4	23–26		22.3	20–25		26.1	24–29	
Underage children		0.498			0.411			0.641			0.378			0.683	
Yes	21.2	18–25		20.0	15–23		23.9	20–27		21.7	16–24		26.4	24–29	
No	22.3	20–25		20.5	17–24		23.9	21–26		21.7	19–24		26.1	23–29	
Unknown	25.3	23–26		24.3	21–25		27.0	23–28		24.5	24–25		27.3	24–29	
Menopausal status			.466			.464			.126			.342			.410
Premenopausal	21.8	18–25		20.4	16–24		22.8	20–26		21.3	17–24		26.4	24–29	
Postmenopausal	22.4	20–25		20.5	17–24		24.1	22–26		21.9	19–25		26.0	23–29	
The diameter of the tumor			.119			.081			.334			.203			.520
T1 (<2 cm)	22.4	20–25		20.6	17–24		23.9	21–26		22.1	19–24		26.4	24–29	
T2 (2–5 cm)	21.2	18–24		19.4	16–23		23.6	20–26		21.2	18-24		26.4	23–28	
T3 (>5 cm)	22.9	21–25		24.7	18–26		24.5	23–27		23.4	20–25		25.2	24–29	
T4	26.6	22–28		24.9	20–27		28.5	23–29		25.4	22–28		28.8	25–29	
Multifocal tumor			.020			.018			.046			.136			.133
Yes	21.0	18–24		20.0	15–22		22.5	20–25		21.4	17–23		24.9	23–27	
No	22.8	20–25		21.0	17–24		24.1	21–26		22.3	19–25		26.4	24–29	
Histological type			.669			.798			.800			.616			.637
Ductal carcinoma	22.3	19–25		20.5	16–24		24.0	21–26		21.7	18–25		26.4	23–29	
Lobular carcinoma	21.9	21–24		20.6	17–23		23.2	22–25		21.9	20–23		26.0	24–28	
Other	24.8	21–25		22.2	18–25		23.6	23–25		24.6	20–27		26.4	26–28	
Grade			.588			.420			.933			.502			.279
I	21.6	20–25		20.5	18–25		23.8	21–26		22.2	20–25		26.4	24–29	
II	22.7	20–24		20.7	17–24		23.6	21–26		21.8	18–24		26.3	24–29	
III	22.1	18–25		20.4	15–24		24.2	21–27		21.6	18–25		25.5	22–29	
Metastases			.075			.018			.942			.338			.391
None	22.8	20–25		21.3	18-24		23.9	21–26		22.0	20–24		26.4	24–29	
Regional	21.4	18–24		18.8	15–23		24.0	21–26		21.4	16–25		25.9	23–29	
Estrogen receptors			.768			.568			.648			.883			.890
Positive	22.1	19–25		20.6	17–24		23.7	21–26		21.9	19–24		26.2	24–29	
Negative	22.2	19–25		20.3	17–24		24.0	21–25		21.5	18–25		26.4	23–29	
Progesterone receptors			.465			.283			.555			.387			.843
Positive	21.9	19–25		20.5	16–24		23.5	21–26		21.8	18–24		26.1	24–29	
Negative	22.4	20–25		20.6	17–24		24.2	22–26		22.1	19–25		26.4	22–29	
Type of surgery			.018			.054			.079			.085			.017
Breast conserving	23.1	20–25		20.8	18–24		24.3	22–26		22.5	19–25		26.4	24–29	
Total mastectomy	21.6	19–24		20.3	16–23		23.4	21–25		21.4	19–24		25.2	23–28	
Axilla treatment			.018			.005			.283			.161			.686
Axilla dissection	21.4	18–24		19.3	15—23		23.6	20–26		21.4	18–24		26.2	23–29	
Sentinel node biopsy	23.0	20–25		21.6	18–24		24.1	22–26		22.3	20–25		26.4	24–29	

Abbreviations: IQ, interquartile range; Md, median; QLI, quality of life index.
P values were derived from Mann-Whitney *U* test and Kruskall-Wallis test.

Poorer body image scores were reported by women in the control group (OR, 2.28; 95% CI, 1.01–5.14; Wald statistic, 3.95; *P* = .047) and those with a professional status (OR, 4.31; 95% CI, 1.04–18.0; Wald statistic, 4.00; *P* = .046) or no profession (OR, 3.72; 95% CI, 0.80–17.3; Wald statistic, 2.81; *P* = .094) compared with persons with academic

Table 4 • Factors Associated With Sum Variables for 23-Item Quality of Life Questionnaire Breast Cancer Module

	Body Image			Sexual Functioning			Future Perspective			Side Effects			Breast Symptoms			Arm Symptoms		
Factor	Md	IQ	*P*	Md	IQ	*P*	Md	IQ	*P*	Md	IQ	*P*	Md	IQ	*P*	Md	IQ	*P*
Age, y			.003			.095			.366			.197			<.001			.001
<55	66.7	42–92		33.3	0–33		33.3	0–67		19.1	10–33		33.3	25–42		33.3	22–56	
≥55	83.3	67–100		16.7	0–33		33.3	0–67		19.1	14–33		25.0	17–33		22.2	11–44	
Education			.070			.845			.795			.937			.027			.006
No professional education	83.3	58–100		33.3	0–33		33.3	0–67		19.1	10–33		25.0	17–33		27.8	11–44	
Professional education	66.7	50–92		33.3	0–33		33.3	0–67		19.1	14–33		33.3	19–42		33.3	22–56	
Academic education	79.2	67–100		33.3	8–33		33.3	0–67		19.1	14–29		25.0	8–33		22.2	11–33	
Employment status			.057			.001			.110			.266			.030			.024
Employed	66.7	50–92		33.3	8–33		33.3	0–67		19.1	10–33		33.3	17–42		33.3	22–44	
Retired	83.3	67–100		8.33	0–33		33.3	0–67		19.1	14–36		25.0	17–33		22.2	11–44	
Underage children			.298			.054			.725			.250			.293			.037
Yes	66.7	33–100		33.3	8–50		33.3	0–67		19.1	10–28		33.3	25–42		33.3	11–44	
No	76.4	50–100		33.3	0–33		33.3	0–67		19.1	14–33		25.0	17–42		22.2	17–44	
Unknown	66.7	63–92		16.7	8–25		50.0	33–83		23.8	12–38		16.7	13–21		22.2	11–33	
Menopausal status			.006			.001			.371			.094			.048			.012
Premenopausal	66.7	33–83		33.3	17–58		33.3	0–50		19.1	10–33		33.3	25–43		33.3	22–56	
Postmenopausal	83.3	58–100		16.7	0–33		33.3	0–67		19.1	14–33		25.0	17–42		22.2	11–44	
The diameter of the tumor			.873			.190			.440			.146			.011			.068
T1 (<2 cm)	75.0	58–100		33.3	0–33		33.3	0–67		19.1	10–33		25.0	17–42		22.2	11–44	
T2 (2–5 cm)	75.0	33–96		16.7	0–33		33.3	0–67		23.8	14–38		33.3	24–50		33.3	22–56	
T3 (>5 cm)	75.0	46–96		16.7	0–33		33.3	0–67		14.3	12–19		25.0	17–42		44.4	17–61	
T4	79.2	63–92		50.0	42–58		66.7	50–67		31.0	12–60		23.6	20–33		27.8	22–33	
Multifocal tumor			.002			.253			.972			.944			.944			.383
Yes	58.3	33–83		33.3	0–33		33.3	0–67		19.1	14–33		25.0	17–42		33.3	22–50	
No	83.3	58–100		16.7	0–33		33.3	0–67		19.1	14–33		25.0	17–42		22.2	11–44	
Histological type			.727			.119			.233			.175			.016			.668
Ductal carcinoma	75.0	53–96		33.3	0–33		33.3	0–67		19.1	14–33		25.0	17–42		22.2	11–44	
Lobular carcinoma	75.0	37–100		33.3	17–33		33.3	0–33		19.1	10–33		33.3	17–50		33.3	11–44	
Other	75.0	67–100		33.3	17–67		33.3	0–33		14.3	10–19		12.5	4–25		27.8	22–33	
Grade			.178			.369			.654			.493			.587			.208
I	75.0	54–92		16.7	0–33		33.3	0–67		21.4	10–36		25.0	17–42		22.2	11–44	
II	83.3	53–100		33.3	0–33		33.3	0–67		19.1	12–25		25.0	17–42		27.8	22–44	
III	66.7	50–92		33.3	0–33		33.3	0–67		21.9	14–33		33.3	22–42		33.3	22–56	
Metastases			.005			.652			.358			.765			.325			<.001
None	83.3	67–100		33.3	0–33		33.3	0–33		19.1	10–33		25.0	17–42		22.2	11–33	
Regional	66.7	33–92		33.3	0–33		33.3	0–67		19.1	14–33		33.3	17–42		44.4	22–56	

Estrogen receptors			.845			.956			.508			.350			.177			.024
Positive	75.0	50–92		33.3	0–33		33.3	0–67		19.1	14–33		33.3	17–42		33.3	22–56	
Negative	83.3	33–100		33.3	0–33		33.3	0–67		17.9	10–33		25.0	17–33		22.2	11–39	
Progesterone receptors			.245			.682			.162			.503			.553			.131
Positive	75.0	50–92		33.3	0–33		33.3	0–67		19.1	14–33		25.0	17–42		33.3	22–44	
Negative	83.3	58–100		33.3	0–33		33.3	0–67		19.1	10–33		25.0	17–33		22.2	11–44	
Type of surgery			<.001			.180			.959			.613			.380			.033
Breast conserving	83.3	67–100		33.3	0–33		33.3	0–67		19.1	14–33		25.0	17–42		22.2	11–44	
Total mastectomy	62.5	33–83		16.7	0–33		33.3	0–67		19.1	14–33		25.0	22–42		33.3	22–44	
Axilla treatment			<.001			.603			.190			.314			.810			<.001
Axilla dissection	66.7	33–92		33.3	0–33		33.3	0–67		19.1	14–33		25.0	17–42		33.3	22–56	
Sentinel node biopsy	83.3	68–100		33.3	0–33		33.3	0–67		19.1	10–33		33.3	17–42		22.2	11–33	

Abbreviations: IQ, interquartile range; Md, median; QLI, quality of life index.
P values were derived from Mann-Whitney *U* test and Kruskall-Wallis test.

education. Also, negative estrogen (OR, 4.94; 95% CI, 1.33–18.3; Wald statistic, 5.70; $P = .017$) and total mastectomy (OR, 6.29; 95% CI, 2.37–16.6; Wald statistic, 13.71; $P < .001$) contributed to poorer body image. Demographic and clinical characteristic of patients explained 36.3% of total variance of the lowest quartile of body image scores.

Women who reported higher sexual functioning scores were employed (OR, 0.28; 95% CI, 0.12–0.63; Wald statistic, 9.44; $P = .002$), and their histological type was ductal carcinoma (OR, 0.15; 95% CI, 0.05–0.50; Wald statistic, 9.62; $P = .002$). Grade and type of surgery approached statistical significance in the OR model, which explained 23.7% of total variance of sexual functioning.

Women in the intervention group had higher future perspective scores compared with women in the control group (OR, 0.35; 95% CI, 0.19–0.68; Wald statistic, 9.93; $P = .002$). Women with lobular carcinoma histological type had future perspective scores that forecasted better futures than did women with ductal carcinoma (OR, 0.35; 95% CI, 0.13–0.95; Wald statistic, 4.24; $P = .039$). Demographic and clinical characteristics of patients explained 18.6% of the total variance of the lowest quartile of the future perspective scores. Poor side effects were explained only by the control group (OR, 2.20; 95% CI, 1.18–4.10; Wald statistic, 6.21; $P = .013$; R^2, 0.110).

Breast-conserving type of surgery (OR, 0.40; 95% CI, 0.18–0.89; Wald statistic, 5.07; $P = .024$) and other histological type of carcinoma (OR, 9.36; 95% CI, 1.19–73.4; Wald statistic, 4.53; $P = .033$) with nearly statistically significant negative estrogen receptors and at least 55 years of age were the strongest factors helping to explain the lowest quartile of breast symptom scores. These explained, with other demographic and clinical characteristics of patients, 19.2% of total variance of the lowest quartile of breast symptoms scores. Negative estrogen receptors (OR, 3.52; 95% CI, 1.20–10.4; Wald statistic, 5.22; $P = .022$) and sentinel node biopsy (OR, 4.00; 95% CI, 1.56–10.3; Wald statistic, 8.28; $P = .004$) explained poor arm symptoms scores (R^2, 0.285) with nearly statistical significant employment status.

Perception of the Support Given via Telephone

Almost all women (98%) reported that it would be worthwhile to continue the telephone intervention. Most (90%) of the women also thought that the timing of the support was appropriate; only 10% would have changed the timing. Most women (77%) agreed that the opportunity to talk had helped them. Overall, 74% thought that the support given via telephone had helped them quite much or very much; 23% thought that it had been of little help.

The Effect of the Intervention

Although the scores on the QLI-CV were somewhat higher in the intervention group, there were no statistically significant

Table 5 • Associations of Demographic and Clinical Characteristics of Participants to Poor Quality of Life by QLI-CV

	QLI-CV Global Score		Health/ Functioning		Socioeconomic		Psychological/ Spiritual		Family	
	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI
Group										
Intervention	1.00		1.00		1.00		1.00		1.00	
Control	0.94	0.48–1.84	1.22	0.63–2.33	1.47	0.75–2.88	1.50	0.76–2.97	0.82	0.41–1.66
Age, y										
<55	2.92	1.06–8.05	3.08	1.14–6.34	3.04	1.12–8.25	1.26	0.44–3.60	2.81	1.03–7.66
≥55	1.00		1.00		1.00		1.00		1.00	
Education										
No professional	1.24	0.42–3.72	0.99	0.34–2.88	1.93	0.59–6.30	1.41	0.40–4.91	0.80	0.26–2.51
Professional	1.29	0.46–3.60	1.13	0.42–3.04	1.57	0.51–4.80	2.66	0.84–8.55	1.40	0.49–3.95
Academic	1.00		1.00		1.00		1.00		1.00	
Employment status										
Employed	0.99	0.41–2.39	0.99	0.42–2.31	1.54	0.62–3.86	1.18	0.48–2.89	0.95	0.39–2.29
Retired	1.00		1.00		1.00		1.00		1.00	
Underage children										
No	0.95	0.34–2.69	1.31	0.48–3.58	1.30	0.46–3.68	0.37	0.13–1.07	2.54	0.80–8.08
Yes	1.00		1.00		1.00		1.00		1.00	
Menopausal status										
Premenopausal	1.00		1.00		1.00		1.00		1.00	
Postmenopausal	2.06	0.70–6.03	1.47	0.53–4.09	1.69	0.59–4.84	1.73	0.57–5.23	2.52	0.82–7.75
Diameter of tumor										
T1 (<2 cm)	1.00		1.00		1.00		1.00		1.00	
T2 (2–5 cm)	1.16	0.51–2.68	1.34	0.60–2.97	1.64	0.69–3.86	1.30	0.56–3.02	1.17	0.49–2.76
T3 (>5 cm)	0.24	0.03–2.20	0.73	0.15–3.45	0.33	0.04–2.94	0.52	0.08–3.21	0.61	0.11–3.42
Multifocal tumor										
No	1.61	0.65–3.96	1.30	0.56–3.04	2.01	0.82–4.90	1.47	0.58–3.02	1.41	0.56–3.54
Yes	1.00		1.00		1.00		1.00		1.00	
Histological type										
Ductal carcinoma	1.00		1.00		1.00		1.00		1.00	
Lobular carcinoma	0.22	0.06–0.83	0.47	0.17–1.33	0.45	0.15–1.34	0.45	0.15–1.36	0.46	0.15–1.43
Other	0.43	0.04–4.20	0.40	0.04–4.06	–		0.61	0.06–6.25	–	
Grade										
I	1.00		1.00		1.00		1.00		1.00	
II	1.37	0.52–3.60	1.68	0.65–4.37	1.09	0.44–2.68	1.94	0.73–5.16	0.83	0.32–2.13
II	1.65	0.59–4.62	1.67	0.61–4.55	0.94	0.34–2.58	1.75	0.61–5.02	0.79	0.29–2.20
Metastases										
None	1.56	0.66–3.67	1.79	0.79–4.08	0.94	0.39–2.25	1.57	0.65–3.80	1.85	0.75–4.56
Regional	1.00		1.00		1.00		1.00		1.00	
Estrogen receptors										
Positive	1.00		1.00		1.00		1.00		1.00	
Negative	0.64	0.22–1.82	0.87	0.32–2.36	1.07	0.36–3.20	2.40	0.83–6.96	0.71	0.25–2.01
Progesterone receptors										
Positive	1.00		1.00		1.00		1.00		1.00	
Negative	0.89	0.35–2.26	0.68	0.27–1.67	0.44	0.16–1.19	0.49	0.18–1.33	1.96	0.78–4.91
Type of surgery										
Breast conserving	1.00		1.00		1.00		1.00		1.00	
Total mastectomy	0.93	0.42–2.04	1.49	0.69–3.20	0.87	0.39–1.93	0.55	0.24–1.25	1.59	0.71–3.54
Axilla treatment										
Axilla dissection	1.00		1.00		1.00		1.00		1.00	
Sentinel node	0.79	0.33–1.89	0.66	0.29–1.54	0.75	0.31–1.83	0.68	0.28-1.64	1.22	0.50-3.01

Abbreviations: CI, confidence interval; OR, odds ratio; QLI-CV, Quality of Life Index-Cancer Version.
Logistic regression models were used, with results given as OR and 95% CI. Poor quality of life is measured to be the "poorest" quartile of distribution.

differences between the scores reported by the women in the intervention and control groups (Table 2). However, statistically and clinically significant differences were noted between the 2 groups of women on the QLQ-BR23 (Table 6).

Table 6 • Associations of Demographic and Clinical Characteristics of Participants to Poor Quality of Life by 23-Item Quality of Life Questionnaire Breast Cancer Module

	Body Image		Sexual Functioning		Future Perspective		Side Effects		Breast Symptoms		Arm Symptoms	
	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI
Group												
Intervention	1.00		1.00		1.00		1.00		1.00		1.00	
Control	2.28	1.01–5.14	1.11	0.58–2.13	0.35	0.19–0.68	2.20	1.18–4.10	1.03	0.53–1.99	0.60	0.29–1.27
Age, y												
<55	1.62	0.43–6.06	1.74	0.63–4.75	1.07	0.60–4.16	0.47	0.17–1.30	0.32	0.10–1.00	0.36	0.10–1.27
≥55	1.00		1.00		1.00		1.00		1.00		1.00	
Education												
No professional	3.72	0.80–17.3	2.42	0.81–7.26	1.58	0.60–4.16	1.85	0.67–5.14	0.54	0.20–1.47	0.70	0.24–2.01
Professional	4.31	1.03–18.0	2.39	0.84–6.83	1.56	0.62–3.93	1.75	0.67–4.57	0.50	0.20–1.29	0.51	0.19–1.40
Academic	1.00		1.00		1.00		1.00		1.00		1.00	
Employment status												
Employed	1.04	0.36–3.00	0.28	0.12–0.63	0.68	0.32–1.43	1.27	0.60–2.69	0.89	0.41–1.91	0.47	0.20–1.08
Retired	1.00		1.00		1.00		1.00		1.00		1.00	
Underage children												
No	1.57	0.42–5.79	1.09	0.37–3.19	1.11	0.39–3.18	1.68	0.56–5.07	0.97	0.29–3.24	0.96	0.26–3.48
Yes	1.00		1.00		1.00		1.00		1.00		1.00	
Menopausal status												
Premenopausal	1.00		1.00		1.00		1.00		1.00		1.00	
Postmenopausal	0.63	0.17–2.39	2.45	0.81–7.44	1.62	0.55–4.81	0.63	0.20–1.90	0.76	0.21–2.78	0.44	0.11–1.79
Diameter of tumor												
T1 (<2 cm)	1.00		1.00		1.00		1.00		1.00		1.00	
T2 (2–5 cm)	1.01	0.37–2.75	1.08	0.48–2.45	0.92	0.41–2.08	1.19	0.54–2.62	0.81	0.34–1.95	0.56	0.20–1.56
T3 (>5 cm)	0.50	0.08–2.90	1.28	0.26–6.35	1.27	0.28–5.68	0.60	0.11–3.30	2.27	0.52–9.83	1.18	0.23–6.01
Multifocal tumor												
No	1.48	0.58–3.78	1.54	0.65–3.67	1.78	0.75–4.24	0.66	0.27–1.63	1.35	0.52–3.47	1.34	0.46–3.88
Yes	1.00		1.00		1.00		1.00		1.00		1.00	
Histological type												
Ductal carcinoma	1.00		1.00		1.00		1.00		1.00		1.00	
Lobular carcinoma	2.21	0.71–6.90	0.15	0.05–0.50	0.35	0.13–0.95	0.83	0.33–2.06	0.99	0.40–2.47	1.19	0.43–3.26
Other	1.37	0.09–19.9	0.60	0.08–4.26	1.30	0.20–8.38	0.41	0.04–3.87	9.36	1.19–73.4	–	
Grade												
I	1.00		1.00		1.00		1.00		1.00		1.00	
II	1.64	0.50–5.40	0.57	0.24–1.34	2.16	0.90–5.18	0.81	0.35–1.87	1.35	0.57–3.19	0.60	0.24–1.51
II	1.26	0.38–4.22	0.37	0.14–1.00	1.39	0.52–3.70	1.40	0.56–3.48	0.60	0.21–1.69	0.54	0.18–1.62
Metastases												
None	1.18	0.43–3.22	1.32	0.56–3.11	0.72	0.31–1.68	1.14	0.50–2.57	0.67	0.28–1.60	0.83	0.29–2.32
Regional	1.00		1.00		1.00		1.00		1.00		1.00	
Estrogen receptors												
Positive	1.00		1.00		1.00		1.00		1.00		1.00	
Negative	4.94	1.33–18.3	1.09	0.40–2.97	0.83	0.33–2.12	0.78	0.30–1.99	2.63	0.97–7.16	3.52	1.20–10.4
Progesterone receptors												
Positive	1.00		1.00		1.00		1.00		1.00		1.00	
Negative	0.40	0.12–1.41	0.58	0.23–1.46	1.31	0.57–3.02	1.28	0.57–2.89	0.81	0.33–1.96	0.52	0.19–1.42
Type of surgery												
Breast conserving	1.00		1.00		1.00		1.00		1.00		1.00	
Total mastectomy	6.29	2.37–16.6	2.18	1.00–4.78	1.02	0.50–2.09	1.06	0.52–2.15	0.40	0.18–0.89	1.15	0.49–2.68
Axilla treatment												
Axilla dissection	1.00		1.00		1.00		1.00		1.00		1.00	
Sentinel node	0.36	0.12–1.07	0.81	0.35–1.86	1.88	0.83–4.26	1.09	0.49–2.42	0.49	0.21–1.16	4.00	1.56–10.3

Abbreviations: CI, confidence interval; OR, odds ratio.

Logistic regression models were used, with results given as OR and 95% CI. Poor quality of life is measured to be the poorest quartile of distribution.

Women in the intervention group had a better body image (*P* = .036), worried less about the future (*P* = .010), and had fewer postoperative side effects (*P* = .004) compared with patients in the control group. There was a small clinical but

Table 7 • Distributions of the Sum Variables for European Organization for Research and Treatment of Cancer Quality of Life Study Group Core's 23-Item Quality of Life Questionnaire Breast Cancer Module Expressed by means (M) and Medians (Md) with SD and interquartile ranges (IQ) According to Intervention in the Study Population (N = 228)

	Intervention Group (n = 120)				Control Group (n = 108)				Difference	
Subscales	M	SD	Md	IQ	M	SD	Md	IQ	Statistical	Clinical[a]
Body image[b]	73	29	83	58–100	67	28	75	42–92	.036	Small
Sexual functioning[b]	29	26	33	0–33	24	22	17	0–33	.203	Small
Future perspective[b]	40	33	33	0–67	29	30	33	0–50	.010	Moderate
Postoperative side effects[c]	21	15	19	10–32	27	16	24	14–38	.004	Small
Breast symptoms[c]	29	16	25	17–42	31	19	33	17–44	.645	
Arm symptoms[c]	30	22	22	11–44	33	21	33	22–44	.305	

Differences between groups were tested by Mann-Whitney *U* test.

[a] Clinical difference according to mean scores: small (5–10 points), moderate (11–19 points), and large (≥20 points).

[b] Scores ranging from 0 to 100, with a higher score representing a higher level of functioning.

[c] Scores ranging from 0 to 100, with higher score representing a greater degree of symptoms.

not statistically significant difference between the groups in sexual functioning (Table 7).

Discussion

This study was designed to evaluate the QOL and the effect of telephone support on QOL of women with breast cancer during their early phase of treatment. The telephone-based support was provided by a physiotherapist 1 week after surgery, before any adjuvant treatment. In our sample, QLI-CV scores indicated a relatively high level of QOL, which is consistent with the findings of both Rustoen et al[6] and Sammarco[13] in their studies involving women with breast cancer.

Our results revealed statistically significant associations between age and the global QLI-CV and age and the socioeconomic subscale, in which women younger than 55 years experienced a poorer QOL than did women aged 55 years or older. These results are consistent with the findings of Rustoen and colleagues.[6] Previous research similarly indicates that younger women report a poorer body image compared with older women.[11,13,17] In addition, younger women in our study had more arm and breast symptoms than older women. It is possible that older women have less difficulty adjusting to their breast cancer and are not as vulnerable as younger women. Younger women may be more concerned about the future and experience uncertainty about possible spreading of the cancer. They may be worried about their family especially if they have young children. To younger women, lost of breast results more to the body image and may affect women's femininity and consequently their sexual functioning and partnership. Older women have more experiences with hardships and could have other serious diseases in addition to breast cancer, which could diminish the full impact of breast cancer and its treatments on the QOL for these women. In addition, older women may be financially more secure than younger women. A previous report indicated that employed women have a better QOL compared with unemployed or retired women,[15] and this was partly the case in our study, too, wherein employed women had better sexual functioning. However, employed women had poorer socioeconomic QLI-CV and had more breast and arm symptoms than retired women. For older, retired women, the financial situation may be more stable than younger, employed women who needed to take a prolonged sick leave for breast cancer treatments.

Our finding on the type of surgery and axillary treatment predicting QOL is similar to previous reports of patients undergoing mastectomy who have a lower QOL compared with those undergoing breast-conserving surgery.[6,8] These findings suggest the more extensive surgery produces more negative effects on QOL. Engels et al[10] also reported that patients who underwent mastectomy had lower body image scores, felt less attractive, were not happy with their appearance, were sexually less active, and felt insecure. In our study, age emerged as the strongest predictor of poor QOL in global QLI-CV and in the health and functioning, socioeconomic, and family subscales. Our age findings underscore the importance of clinicians giving particular support to younger patients with breast cancer who underwent mastectomy and axilla dissection. Clinicians need to give special attention to the physical functioning such as postoperative movement of the upper limb and arm of the younger women.

Almost all of the women in the intervention group reported that the single telephone intervention had a positive impact on their QOL. These reports are clinically important and may in part be explained by a perception that they are still being taken care of after hospital discharge and that they have not been forgotten.[28] Of all the components in our intervention, having the opportunity to ask questions about bothersome issues was reported as most helpful to the women in our study. Today, patients with breast cancer in Finland stay in the hospital for about 24 hours after surgery. The immediate postoperative period can be a stressful time for women as they recover from surgery and wait for the start of adjuvant treatments. The intensity of this recovery period may be such that the women are not ready to pose questions to clinicians until they return home and begin to adapt to their new clinical situation. Previous findings indicate that clinicians have not adequately addressed support and education needs of women with breast cancer.[5,7,16–17,23–24] Perhaps the timing of the delivery of support and education interventions is one factor that may help to explain the perception of inadequate provision of support.

We found no statistically significant differences between the 2 groups in global QLI-CV or in the 4 QLI-CV domains but did document statistical and clinically significant differences on the QLQ-BR23 between the 2 groups of women in body image, future perspective, and postoperative side effects. These results indicate that the telephone intervention helped to reduce the women's future health concerns and helped them adapt to their altered body image and illness. These findings are consistent with earlier studies of QOL and telephone support in patients with breast cancer. Wilmoth and colleagues[28] found that women who received a telephone support intervention, in addition to educational materials for 1 year, had a better attitude toward living with their breast cancer. Allard[30] reported reduced emotional stress after 2 telephone sessions as a result of women's improved ability to cope with their symptoms.

No statistically or clinically significant differences emerged between the 2 groups in breast and arm symptoms. One possible explanation of the limited intervention effects on these variables is the early assessment point in the immediate postoperative period. According to several studies, the breast cancer diagnosis and surgery affect the physical and psychosocial well-being of women.[4–11] Emotional distress may influence perceptions of symptoms. Over time, more significant improvements in this set of variables may be found. For example, in one prospective, randomized study in which the intervention group received psychosocial support from an oncology nurse, women reported the largest improvements from baseline to 6 months.[20]

This study has several limitations. First, we were not able to control other co-occurring diagnoses although they have might have had an effect on QOL results. Second, we were unable to control the motivation of patients to take part in the intervention or the motivation of nurses to contribute to the recruitment process, which may have contributed to a sampling bias. In Finland, the treatment of patients with breast cancer is centralized, and the Pirkanmaa hospital district is the second largest in the country. Consequently, the sample represents patients with breast cancer in Finland, and these findings can be reliably generalized to all Finnish-speaking patients with breast cancer aged 18 to 75 years in the Pirkanmaa hospital district in the south of Finland. Furthermore, the results can be generalized with caution to the whole of Finland. The results reported here may have been influenced by the amount of support received from other sources, such as other healthcare staff, family, and significant others. Finally, women's coping strategies may have had an effect on their QOL, but these were not taken into consideration in this study.

Conclusions and Implications for Nursing Practice

Our telephone intervention 1 week after surgery to address subjective concerns of patients with breast cancer proved to have a beneficial impact on QOL. Women with breast cancer were relatively satisfied with their lives, and their QOL was quite high despite the diagnosis they had received, the surgical procedure, and the consequent physical and psychological symptoms. However, it is important to be aware of the importance of QOL in patients with breast cancer and especially to consider the difficulties that younger women experienced immediately after the operation. Problems with body image require special attention to prevent difficulties in family functioning and in partner relationships. Based on these results, there is certainly good reason to recommend telephone support as an alternative method of postoperative intervention, although they did not show improvement in all QOL domains. Telephone intervention is a feasible way to contact a large amount of patients, and it is easy to implement in practice because it does not presume a lot of resources.

Telephone support given by a physiotherapist 1 week after short hospitalization may prove to be an effective way of increasing QOL of patients with breast cancer after breast cancer surgery. Women should be offered systematic support and information about different follow-up options including rehabilitation and support groups, so that they do not feel left alone. It is important to be aware of patients' individual needs for support and to target support accordingly. Clinician support and education are an essential part of the care of patients with breast cancer. In clinical practice, the cooperation between oncology nurses and physiotherapists is essential when recognizing and meeting the support and education requirements of patients with breast cancer and planning the follow-up protocol to help patients to cope better. Physiotherapists play an important role in this process, provided that their expertise can be put to effective and appropriate use. Further research is needed to examine the cost-effectiveness of telephone intervention compared with other supportive methods to meet the needs of patients with breast cancer.

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