ORIGINAL ARTICLE
Turk J Surg 2023; 39 (3): 237-248

The effect of surgery and hormone therapy on quality of life in breast cancer patients receiving radiotherapy

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ABSTRACT

Objective: The aim of this study was to examine the effect of surgery type and hormone therapy on the general quality of life in breast cancer patients receiving radiotherapy.

Material and Methods: A total of 109 patients were included in the study. As data collection tools in the research, a form stating the demographic and clinical features was used in the first part, and in the second part, "EORTC QLQ-C30" developed by the European Organization for Research and Treatment of Cancer and "EORTC QLQ-BR23" Turkish quality of life forms specific to breast cancer were used. The patients were asked to fill in the questionnaire forms on the first day, the last day of radiotherapy and three months after the end of the treatment.

Results: Mean age of this study was 54.8 ± 12.1 years. In the questionnaires made on the first day, last day and three months after radiotherapy, the highest score according to the EORTC QLQ-C30 scale was in social and cognitive function, and in sexual life on the EORTC QLQ-BR23 scale. According to multiple comparison test and comparing the first day of radiotherapy and three months after radiotherapy, there was a significant difference in patients' physical function average ($p= 0.049$), future expectation ($p= 0.033$), sexual life ($p= 0.029$), sexual satisfaction ($p< 0.001$), and hair loss ($p= 0.011$), and arm related problems ($p< 0.001$). According to the analysis of variance in repeated measurements, physical function, sexual life, side effects, hair loss, dyspnea, and future expectation were statistically significant according to the type of surgery, and for hormone therapy, sexual life, hair loss, constipation and financial difficulty were found statistically significant.

Conclusion: It was observed that other than radiotherapy, hormone therapy and surgical techniques were also effective on the quality of life in patients receiving radiotherapy for breast cancer.

Keywords: Breast cancer, radiotherapy, hormone therapy, surgery, quality of life, QLQ-C30, QLQ-BR23

INTRODUCTION

Breast cancer is the most common type of cancer diagnosed in women, apart from skin cancers. It affects approximately 2.1 million women each year (1). Although the incidence of breast cancer is higher in developed countries, the diagnosis of breast cancer is increasing in almost every country. In Türkiye, according to the 2016 data of the Ministry of Health, breast cancer ranks first among the top ten most common cancer types in women (2,3). Although breast cancer-related mortality is decreasing gradually in many countries, it is the most common cause of cancer-related deaths among women (1-3).

Due to the developments in the diagnosis and treatment of cancer in recent years, breast cancer is diagnosed at an early stage. Accordingly, the concept of quality of life in patients has begun to come to the fore as a result of prolongation of survival and therefore long-life expectancy. Breast cancer treatment includes surgery, radiotherapy, chemotherapy, hormone therapy and targeted therapies. Some side effects seen in these treatments negatively affect the general quality of life in women (4). Radiotherapy is usually started after the end of adjuvant chemotherapy or 3-8 weeks after surgery when wound healing is complete. The aim of radiotherapy is to provide the best local tumor control with low complication rates. As with all treatment types, some side effects are seen in radiotherapy. Radiotherapy can cause fatigue, nausea, vomiting, esophagitis, and therefore a decrease in work force can be observed. In addition, hair loss, drying and discoloration of the skin can be seen in some changes in the skin area within the radiotherapy area. Nerves entering the treatment area may also be adversely affected by radiation, loss of

Cite this article as: Benderli Cihan Y, Öztürk O. The effect of surgery and hormone therapy on quality of life in breast cancer patients receiving radiotherapy. Turk J Surg 2023; 39 (3): 237-248.

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Received: 04.05.2023
Accepted: 30.08.2023
Available Online Date: 27.09.2023

DOI: 10.47717/turkjsurg.2023.6087

sensation and weakness may occur in the area where the nerves are dispersed. The surgical technique applied or the combined hormone therapy/chemotherapy drugs may cause an increase in these side effects. It is important to determine and treat the factors affecting the quality of life in this group of patients (5).

Various quality of life evaluation modules have been developed in order to objectively evaluate the general quality of life of the patients. Headquartered in Brussels, Belgium, the European Organization for Research and Treatment of Cancer (EORTC) is one of the leading organizations in cancer treatment and research in Europe. It carries out studies on the treatment of cancer and attaches importance to the quality of life of patients receiving this treatment. With the questionnaires it has developed, it provides the opportunity to question the quality of life of the patients in an international common language. The most widely used module among the questionnaires developed by EORTC is the Quality of Life Questionnaire-Core30 (QLQ-C30) general quality of life questionnaire. In addition, EORTC has many other surveys on different body parts and organs. In patients with breast cancer, the EORTC QLQ-BR23 questionnaire is widely used (6-9).

Based on the knowledge that breast cancer is the most common cancer among women and that the treatments applied will affect the quality of life, this study was planned to determine the effect of the type of surgery and hormone therapy on the quality of life in patients with breast cancer who received radiotherapy.

MATERIAL and METHODS

Method of Study

This study was conducted as a descriptive, prospective, and analytical study to determine the effect of radiotherapy on general quality of life in patients with breast cancer.

Ethical Aspect of the Study

Permission was obtained from the ethics committee for this study.

Location of the Study and Sampling Group

It consisted of 109 patients who came to receive adjuvant radiotherapy for breast cancer. Radiotherapy was started 3-8 weeks after the operation in patients who had received neoadjuvant chemotherapy. In patients who received adjuvant chemotherapy, adjuvant radiotherapy was applied after chemotherapy had been finished.

Selection criteria of cancer patients included in the study were as follows:

a. 18 years of age and older,

b. Willing to participate,

c. Able to answer questions,

d. The patient or one of her relatives is literate,

e. Without patients receiving psychological support,

f. Without neurological or psychiatric disorders that prevent the completion of the questionnaire,

g. With a Karnofsky performance score of ≥50, 1-3. patients with a diagnosis of stage 1-3 breast cancer who voluntarily agreed to participate in the study were included in the study.

Data Collection Tool

Patients were asked to fill out the questionnaires on the first and last day of radiotherapy and three months after radiotherapy. Written informed consent was obtained from the individuals participating in the study, explaining the purpose, plan, and benefits of the study. The questionnaire form was composed of two parts. In the first part, information about the patient's age, marital status, educational status, and family history of cancer was included. These questions were asked to the individuals by the researcher and recorded. In the second part, clinical information about the disease was recorded by learning from the patient's file, whether the patient received surgery, chemotherapy and hormone therapy, tumor location, pathological diagnosis, receptor status and stage. The Turkish versions of the EORTC QLQ-C30 and EORTC QLQ-BR23 scales were used.

EORTC QLQ-C30 scale

This scale is known as general quality of life and includes 30 questions. These consist of three sub-dimensions: functional functions (physical, role, cognitive, emotional, social), symptom scale (fatigue, pain, nausea/vomiting, dyspnea, insomnia, anorexia, constipation, diarrhea, financial difficulty) and general well-being. The first 28 of the scale questions are four-point Likert type. The answers given; not at all (1 point), a little (2 points), quite (3 points), a lot (4 points). High scores from the first 28 questions indicate low quality of life, and low scores indicate high quality of life. The 29th and 30th questions of the scale constitute the general quality of life area. In the 29th question of the scale, the patient is asked to evaluate her general health in the past week, and in the 30th question, the quality of life of the last week, with the scores given from one to seven as very bad (1 point), very good (7 points). Low scores in this section indicate low quality of life, and high scores indicate high quality of life.

The scale consists of three basic sub-dimensions. Although each basic sub-dimension also contains sub-dimensions, there are a total of 15 sub-dimensions in the whole scale (Table 1).

Table 1. EORTC QLQ-C30 cancer quality of life scale	
Scales	**Materials**
Functional status	
Physical function	1-5
Role function	6-7
Emotional function	21-24
Cognitive function	20, 25
Social function	26-27
Global health status (general well-being)	29-30
Symptom scale	
Weakness	10, 12, 18
Nausea-Vomiting	14-15
Ache	9, 19
Dyspnea	8
Insomnia	11
Loss of appetite	13
Constipation	16
Diarrhea	17
Financial difficulty	28

Scoring of the scale is made according to the hundredth system. Scores ranging from 0-100 are obtained from each sub-dimension. There are formulas applied to find the equivalent of the scores obtained from the scale in the hundredth system. Functional score, Symptom score, and General Health score are calculated with the following formulas:

Calculation of the functional score (FS): The patient's total score from 15 questions is divided by the total number of questions (15) and the Raw score (RS) was calculated. The range value, on the other hand, gave the value of three, which is the difference between the highest score (4) and the lowest score (1) given to the answers. With these values, FS is calculated with the formula FS= {1 - (RS - 1)/range} x 100.

Calculation of social function score (SFS): Raw score (RS) is calculated by dividing the total score of the patient from questions 26 and 27 by two, which is the total number of questions. Then the range value is found as in FS. With these values, SFS is calculated with the formula SFS= {1 - (RS - 1)/range} x 100.

Symptom score (SS): Raw score (RS) is calculated by dividing the total score from 13 questions by the total number of questions (13). Then the range value is found as in FS. With these values, SS is calculated with the formula SS= {(RS - 1)/range} x 100.

Calculation of the fatigue score (FAS) in the symptom scale: The raw score (RS) is calculated by dividing the total score of the patient from questions 10, 12 and 18 by the total number of questions. The difference (3) range value between the highest score (4) and the lowest score (1) given to the answers is found. With these values, FAS is calculated with the formula= {(RS - 1)/range} x 100.

Calculation of general health score (GSS): Raw score (RS) is calculated by dividing the total score from the last two questions by the total number of questions (2). The difference between the highest score (7) and the lowest score (1) in these two questions is calculated as the range value (6). These values are calculated with the formula GSS= {(RS - 1)/range} x 100.

The European Organization for Research and Treatment of Cancer periodically renews the EORTC QLQ-C30 with different versions. According to these, studies investigating the validity and reliability in Turkish have been carried out. In the study of Demirci et al., Cronbach's alpha value for body image and sexual function sub-dimensions was 0.88, Cronbach's alpha for treatment side effects sub-dimension was 0.73, and Cronbach's alpha for breast symptoms sub-dimension was 0.66 (9).

EORTC QLQ-BR23 scale

It is a quality-of-life questionnaire prepared specifically for breast cancer. This questionnaire is divided into two subgroups as functional and symptom scales and consists of 23 questions. On the functional scale, body image, sexual function, sexual satisfaction, and future expectation are measured, and on the symptom scale, systemic treatment side effects, breast-related problems, arm-related problems, and discomfort related to hair loss are measured. In the QLQ-BR23, each parameter has a score between 0 and 100. A high score on the functional scale indicates good health, and a high score on the symptom scale indicates an excess of symptoms (Table 2).

Table 2. EORTC QLQ-BR23 breast cancer specific scale	
Scales	**Materials**
Functional scale	
Body image	39-42
Future expectation	43
Sex life	44-45
Sexual satisfaction	46
Symptom scale	
Side effect	31-34, 36-38
Hair loss	35
Arm reletad problems	47-49
Breast reletad problems	50-53

Analysis of Data

While the findings obtained in the study were evaluated, statistical analyzes were carried out in computer environment using TURCOSA (Turcosa Analitik Çözümlemeler LTD. ŞTİ., www.turcosa.com.tr) statistical software. The results were sociodemographic and disease-related characteristics; given as numbers, percentages, and averages. Quality of life scale scores were calculated using the above-mentioned formulas: The conformity of the data to normal distribution was evaluated with the Shapiro-Wilk test. Homogeneity of variance was evaluated with Levene's test. Hormone therapy and surgical status of the patients on the EORTC QLQ-C30 and EORTC QLQ-BR23 scales were evaluated by one- way repeated measure ANOVA (post-hoc test: Bonferroni) and Student's t test analysis. The results were evaluated at the 95% confidence Interval, and the significance level was $p< 0.05$.

Limitation of the Study

The limitation of the study is that the study was conducted with a specific patient group in only one center.

Strengths of the Research

The strength of the study is that the sample group was carried out by a single physician and the results were monitored.

RESULTS

Sociodemographic and clinical characteristics of the patients are given in Table 3. Mean age was 54.8 ± 12.1 years. The most common surgery was breast conserving surgery, and the most common type of pathology was invasive ductal carcinoma. Of the patients, 62.4% were postmenopausal, and pT3 was 47.7%, pN3 was 45.9%, chemotherapy was 97.2%, and hormone therapy was 85.3%.

In the questionnaires made on the first day, the last day and three months after radiotherapy, the highest score according to the EORTC QLQ-C30 scale was in social and cognitive function, and in sexual life on the EORTC QLQ-BR23 scale. In our study, according to multiple comparison of the repeated measure ANOVA test results, the result was significant for the physical function ($p= 0.049$) variable between the time groups receiving radiotherapy (first day, last day, and three months later) (Table 4). These analyses for the EORTC QLQ-BR23 scales were investigated for future expectation ($p= 0.033$), sexual life ($p=0.029$), sexual satisfaction ($p< 0.001$), hair loss ($p= 0.011$) and arm related problems ($p< 0.001$) are found statistically significant (Table 5).

According to the repeated measure ANOVA of the EORTC QLQ-C30 scale, surgical status of the patients who underwent BCS was found to be significant for the variable of physical function ($p^*= 0.008$) at three different times (first, last day and three months after radiotherapy). There was a significant difference in the measurement of dyspnea ($p#= 0.047$) on the last day of

Table 3. Sociodemographic and clinical characteristics of the patients participating in the study

Quantitative variables	**$\bar{x}$ ± SD**
Age	54.86 ± 12.17
	Median (min-max)
	54.00 (24.00-84.00)
Qualitative variables	**n (%)**
Work at work	
No	99 (90.8)
Yes	10 (9.2)
Marital status	
Single	15 (14.3)
Married	90 (85.7)
Education status	
No	26 (23.9)
Yes	83 (76.1)
Cancer in the family	
No	83 (76.1)
Yes	26 (23.9)
Menopause	
Pre	41 (37.6)
Post	68 (62.4)
Additional disease	
No	72 (66.1)
Yes	37 (33.9)
Breast location	
Left	67 (61.5)
Right	42 (38.5)
Pathology type	
Invasive ductal carcinoma	95 (872.)
Others (mucinous, etc)	14 (12.8)
Tumor Stage (AJCC 2009 stage)	
1	11 (10.1)
2	38 (34.9)
3	52 (47.7)
4	8 (7.3)
Lymph node (AJCC 2009 stage)	
0	11 (10.1)
1	6 (5.5)
2	42 (38.5)
3	50 (45.9)
Stages	
1	1 (0.9)
2	13 (12.0)
3	94 (87.1)

Table 3. Sociodemographic and clinical characteristics of the patients participating in the study (continue)	
Quantitative variables	**x̄ ± SD**
Estrogen status	
Negative	16 (14.7)
Positive	93 (85.3)
Progesterone status	
Negative	27 (24.8)
Positive	82 (75.2)
HER status	
Negative	96 (88.1)
Positive	13 (11.9)
Surgical condition	
Modified radical mastectomy	37 (33.9)
Breast conserving surgery	72 (66.1)
Chemotherapy	
No	3 (2.8)
Yes	106 (97.2)
Hormone therapy	
No	16 (14.7)
Yes	93 (85.3)
x̄: Arithmetic mean, SD: Standard deviation.	

radiotherapy by Student's t test, compared to patients with BSC who had surgical intervention MRM. In addition, the measurements of constipation (p*= 0.032) of the patients who did not receive hormone therapy were significant in terms of the time they received radiotherapy. According to the multiple comparison test of the constipation and financial difficulty variable, the measurement of the patients who did not receive hormone therapy three months after radiotherapy was also significant compared to the measurement of radiotherapy on the first day (Tables 6-10).

In the analyses performed on the EORTC QLQ-BR23 scale, mean differences of body image, future expectation and sexual life scales were not found statistically significant in terms of the time (first day, last day, three months later) patients with MRM and BSC received radiotherapy. The variables of future expectation (p*= 0.021) of the patients with surgical intervention for BSC and sexual life (p*= 0.013) of the patients who received hormone therapy were found to be statistically significant in terms of the time they received radiotherapy (Table 11). The variable of sexual satisfaction (p*= 0.019) of the patients with MRM was statistically significant, meanwhile patients with surgical intervention BSC had sexual satisfaction (p*= 0.011), side effects (p*= 0.030), and hair loss (p*= 0.045). The hair loss (p*= 0.007) variable of the patients who did not receive hormone therapy was found to be statistically significant, and at the same time, the variable of sexual satisfaction (p*= 0.002)

Table 4. Comparison of the mean scores of the EORTC QLQ-C30 cancer quality of life scale of the patients participating in the study

Variables	**When receiving radiotherapy**			**p**
	First day (n= 109) x̄ ± SD	**Last day (n= 109) x̄ ± SD**	**Three months later (n= 109) x̄ ± SD**	
Physical function	61.47 ± 23.31[a]	60.86 ± 22.02[ab]	54.13 ± 25.90[b]	**0.049**
Role function	68.83 ± 23.14	64.35 ± 19.66	62.81 ± 19.68	0.114
Emotional function	72.48 ± 21.71	67.13 ± 19.99	72.09 ± 19.09	0.122
Cognitive function	78.86 ± 23.96	81.64 ± 18.22	76.70 ± 22.55	0.282
Social function	81.04 ± 21.81	75.99 ± 22.16	76.61 ± 19.66	0.177
General health perception	55.35 ± 20.05	56.57 ± 17.86	55.89 ± 20.30	0.883
Weakness	42.20 ± 28.28	43.12 ± 18.62	40.57 ± 18.48	0.709
Nausea	22.94 ± 25.13	22.02 ± 24.31	23.39 ± 27.04	0.927
Ache	20.64 ± 21.62	18.81 ± 21.17	20.64 ± 21.98	0.772
Dsypnea	24.46 ± 26.70	24.46 ± 26.70	29.05 ± 27.25	0.395
Insomnia	33.95 ± 29.39	26.29 ± 29.42	30.89 ± 29.64	0.193
Loss of appetite	30.58 ± 28.01	29.97 ± 26.43	29.66 ± 24.15	0.970
Constipation	20.18 ± 27.97	26.30 ± 27.99	27.52 ± 31.38	0.138
Diarrhea	24.46 ± 23.41	23.85 ± 18.20	20.49 ± 18.65	0.298
Financial difficulty	17.13 ± 25.51	14.98 ± 22.45	18.96 ± 21.45	0.326

According to the multiple comparison test result (Bonferroni), the difference in alphabetical exponents indicates statistically significant.
x̄: Arithmetic mean, SD: Standard deviation.

Table 5. Comparison of the mean score of the EORTC QLQ-BR23 scale of the patients participating in the study

Variables	When receiving radiotherapy			p
	First day (n= 109) $\bar{x}$ ± SD	Last day (n= 109) $\bar{x}$ ± SD	Three months later (n= 109) $\bar{x}$ ± SD	
Body image	86.25 ± 21.54	83.82 ± 22.62	84.95 ± 24.14	0.748
Future expectation	68.81 ± 35.80[a]	67.28 ± 42.31[ab]	79.51 ± 34.22[b]	**0.033**
Sex life	83.18 ± 23.52[a]	88.69 ± 16.02[b]	89.91 ± 18.57[b]	**0.029**
Sexual satisfaction	76.76 ± 29.22[a]	89.91 ± 18.43[b]	86.85 ± 21.76[b]	**<0.001**
Side effects	35.74 ± 21.23	41.74 ± 24.39	34.98 ± 21.95	0.058
Hair los	33.95 ± 29.39[a]	43.12 ± 26.95[b]	33.95 ± 27.21[a]	**0.011**
Arm related problems	12.35 ± 17.34[a]	8.33 ± 10.20[b]	4.42 ± 8.17[c]	**<0.001**
Breast related problems	43.27 ± 14.72	41.67 ± 11.89	44.34 ± 13.51	0.339

According to the multiple comparison test result (Bonferroni), the difference in alphabetical exponents indicates statistically significant.
$\bar{x}$: Arithmetic mean, SD: Standard deviation.

of the patients who received hormone therapy was found to be statistically significant. According to Table 12, sexual satisfaction, side effects, and hair loss scales of the patients with surgical interventions for MRM and BSC, and those who received and did not receive hormone therapy, for each measurement at the time of radiotherapy (first day, last day, three months later) in the Student's t test was not statistically significant mean differences. Otherwise, the mean difference of hair loss measurement (p#= 0.036) three months after radiotherapy was found to be statistically significantly higher in those who received hormone therapy compared to those who did not. The results were significant in terms of arm-related problems (p*< 0.001) in patients with surgical intervention for BSC and arm-related problems (p*< 0.001) in patients receiving hormone therapy when they received radiotherapy (Tables 11-13).

DISCUSSION

While treatment and supportive treatment in breast cancer are the main goals, increasing the quality of life has been added to these goals in recent years. Since breast cancer is the most common cancer among women and the adverse effect of breast loss on patient identity, it is observed that quality of life is evaluated more frequently than in the past. However, it is not possible to talk about a scale that has yet been developed that can be considered as the gold standard today. Quality of life can vary from individual to individual, from society to society, and from culture to culture, and is affected by many factors. Therefore, it is very difficult to measure and evaluate quality of life. The reason is that the questions in the quality scales do not fully cover the concept of quality of life, and the answers given by the patients are subjective. In addition, the role of quality of life in determining the treatment method to be given to the patient is not clear (6-12).

Quality of life in breast cancer, as in other cancers, refers to general health status, physical functionality, severity of symptoms, psychosocial adjustment of the patient and satisfaction with life. Studies show that cancer disease and its treatment negatively affect the quality of life. While symptoms related to illness and treatment, anxiety, anxieties about the individual and her environment, changes in body image negatively affect the quality of life, factors such as adequate social support systems, comfort, belief in recovery, and economic adequacy can affect positively (5,7,8,10-12). In this study, it was observed that the change in body image, the surgical technique applied, and the use of radiotherapy combined hormone therapy affected the quality of life. In addition, it was observed that the quality of life was lower in the first month after the diagnosis compared to the following months, and the quality-of-life score started to follow a certain line from three months after the treatment. In a study, it has been shown that the quality of life of cancer patients is very low in the first six months after diagnosis (12). Lee et al. have reported that quality of life improve seven months after radiotherapy (13).

The most common problems experienced by breast cancer patients during treatment are symptoms such as pain, weakness, nausea, loss of appetite, alopecia, dyspnea, diarrhea, and insomnia. All these problems cause difficulties in the functional lives of individuals with cancer. In our study, in the questionnaires made on the first day, last day and three months after radiotherapy, physical function was affected according to the EORTC QLQ-C30 scale, and in the QLQ-BR23 scale, it was observed that future expectation, sexual life, sexual satisfaction, hair loss and arm-related problems were affected. These results were found to be affected by the timing of radiotherapy. According to the results of another study conducted in our country to determine the quality of life of patients who received radiotherapy for breast cancer, the most determining subscales on general health in the QLQ-C30 were emotional

Table 6. Comparison of surgical technique and hormone therapy status and the mean score of EORTC QLQ-C30 cancer quality of life scale in the study

Variables	Physical function			p*	Role function			p*	Emotional function			p*
	First day $\bar{x} \pm SD$	Last day $\bar{x} \pm SD$	Three months later $\bar{x} \pm SD$		First day $\bar{x} \pm SD$	Last day $\bar{x} \pm SD$	Three months later $\bar{x} \pm SD$		First day $\bar{x} \pm SD$	Last day $\bar{x} \pm SD$	Three months later $\bar{x} \pm SD$	
Surgery												
MRM (n= 37)	63.60 ± 23.96	55.50 ± 23.89	59.82 ± 25.55	0.342	72.52 ± 22.64	61.26 ± 16.69	64.86 ± 20.33	0.080	72.97 ± 18.26	70.27 ± 19.69	69.14 ± 20.68	0.702
BCS (n= 72)	60.37 ± 23.06[a]	63.61 ± 20.63[a]	51.20 ± 25.76[b]	**0.008**	66.90 ± 23.32	65.69 ± 20.98	61.74 ± 19.39	0.333	72.22 ± 23.40	65.51 ± 20.09	73.61 ± 18.18	0.064
p#	0.495	0.068	0.100		0.233	0.291	0.381		0.865	0.241	0.249	
Hormone therapy												
No (n= 16)	61.67 ± 28.02	59.58 ± 21.97	43.75 ± 27.96	0.117	63.54 ± 22.13	62.50 ± 21.52	63.54 ± 21.27	0.988	69.27 ± 28.50	61.98 ± 24.15	75.00 ± 19.72	0.438
Yes (n= 93)	61.43 ± 22.58	61.08 ± 22.14	55.91 ± 25.25	0.220	69.75 ± 23.30	64.67 ± 19.43	62.68 ± 19.51	0.084	73.03 ± 20.46	69.01 ± 19.20	71.60 ± 19.04	0.216
p#	0.971	0.804	0.083		0.324	0.733	0.827		0.525	0.267	0.512	

According to the multiple comparison test result (Bonferroni), the difference in alphabetical exponents indicates statistically significant.
p*: Repeated measure analysis of variance, p#: Student's t test, $\bar{x}$: Arithmetic mean, SD: Standard deviation, BCS: Breast conserving surgery, MRM: Modified radical mastectomy.

Table 7. Comparison of surgical technique and hormone therapy status and the mean score of EORTC QLQ-C30 cancer quality of life scale in the study

Variables Surgery	Cognitive function			p*	Social function			p*	General health perception			p*
	First day $\bar{x} \pm SD$	Last day $\bar{x} \pm SD$	Three months later $\bar{x} \pm SD$		First day $\bar{x} \pm SD$	Last day $\bar{x} \pm SD$	Three months later $\bar{x} \pm SD$		First day $\bar{x} \pm SD$	Last day $\bar{x} \pm SD$	Three months later $\bar{x} \pm SD$	
Surgery												
MRM (n= 37)	77.78 ± 24.88	81.53 ± 17.91	78.83 ± 20.66	0.741	79.73 ± 20.46	78.38 ± 20.36	75.23 ± 20.27	0.629	58.33 ± 17.24	53.83 ± 19.50	58.78 ± 19.64	0.451
BCS (n= 72)	79.40 ± 23.65	81.48 ± 18.46	75.69 ± 23.39	0.293	81.71 ± 22.58	74.77 ± 23.07	77.31 ± 19.44	0.174	53.82 ± 21.30	57.99 ± 16.93	54.40 ± 20.60	0.320
p#	0.742	0.989	0.493		0.655	0.423	0.602		0.268	0.252	0.287	
Hormone therapy												
No (n= 16)	76.04 ± 27.20	79.17 ± 18.76	70.83 ± 23.96	0.633	79.17 ± 27.55	70.83 ± 27.55	82.29 ± 22.33	0.459	52.60 ± 25.59	53.65 ± 21.51	50.52 ± 18.63	0.913
Yes (n= 93)	79.34 ± 23.49	82.07 ± 18.20	77.72 ± 22.28	0.421	81.36 ± 20.83	76.88 ± 21.14	75.63 ± 19.12	0.147	55.82 ± 19.07	57.08 ± 17.24	56.81 ± 20.52	0.879
p#	0.613	0.581	0.255		0.712	0.315	0.212		0.555	0.480	0.254	

According to the multiple comparison test result (Bonferroni), the difference in alphabetical exponents indicates statistically significant.
p*: Repeated measure analysis of variance, p#: Student's t test, $\bar{x}$: Arithmetic mean, SD: Standard deviation, BCS: Breast conserving surgery, MRM: Modified radical mastectomy.

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Table 8. Comparison of surgical technique and hormone therapy status and the mean score of EORTC QLQ-C30 cancer quality of life scale in the study

Variables	Weakness			p*	Nausea			p*	Ache			p*
	First day $\bar{x} \pm SD$	Last day $\bar{x} \pm SD$	Three months later $\bar{x} \pm SD$		First day $\bar{x} \pm SD$	Last day $\bar{x} \pm SD$	Three months later $\bar{x} \pm SD$		First day $\bar{x} \pm SD$	Last day $\bar{x} \pm SD$	Three months later $\bar{x} \pm SD$	
Surgery												
MRM (n=37)	36.34 ± 19.54	42.64 ± 18.43	40.54 ± 19.28	0.351	22.97 ± 26.16	26.13 ± 26.51	21.62 ± 25.11	0.769	20.27 ± 20.84	19.37 ± 19.84	18.47 ± 18.75	0.935
BCS (n= 72)	45.22 ± 31.56	43.36 ± 18.85	40.59 ± 18.19	0.529	22.92 ± 24.77	19.91 ± 23.01	24.31 ± 28.10	0.592	20.83 ± 22.16	18.52 ± 21.95	21.76 ± 23.51	0.666
p#	0.121	0.849	0.990		0.991	0.207	0.626		0.898	0.844	0.462	
Hormone therapy												
No (n= 16)	50.69 ± 52.58	49.31 ± 20.27	40.97 ± 22.12	0.742	30.21 ± 28.03	18.75 ± 21.84	28.13 ± 32.04	0.431	23.96 ± 29.79	20.83 ± 30.12	30.21 ± 19.45	0.662
Yes (n= 93)	40.74 ± 21.75	42.06 ± 18.23	40.50 ± 17.92	0.841	21.68 ± 24.55	22.58 ± 24.78	22.58 ± 26.20	0.966	20.07 ± 20.05	18.46 ± 19.42	19.00 ± 22.06	0.858
p#	0.195	0.151	0.926		0.212	0.563	0.451		0.509	0.681	0.059	

According to the multiple comparison test result (Bonferroni), the difference in alphabetical exponents indicates statistically significant.
p*: Repeated measure analysis of variance, p#: Student's t test, $\bar{x}$: Arithmetic mean, SD: Standard deviation, BCS: Breast conserving surgery, MRM: Modified radical mastectomy.

Table 9. Comparison of surgical technique and hormone therapy status and the mean score of EORTC QLQ-C30 cancer quality of life scale in the study

Variables	Dsypnea			p*	Insomnia			p*	Loss of appetite			p*
	First day $\bar{x} \pm SD$	Last day $\bar{x} \pm SD$	Three months later $\bar{x} \pm SD$		First day $\bar{x} \pm SD$	Last day $\bar{x} \pm SD$	Three months later $\bar{x} \pm SD$		First day $\bar{x} \pm SD$	Last day $\bar{x} \pm SD$	Three months later $\bar{x} \pm SD$	
Surgery												
MRM (n= 37)	23.42 ± 25.90	31.53 ± 29.34	25.23 ± 26.53	0.473	35.14 ± 27.16	31.53 ± 30.37	24.32 ± 27.94	0.319	32.43 ± 26.63	31.53 ± 27.16	26.13 ± 23.75	0.561
BCS (n= 72)	25.00 ± 27.26	20.83 ± 24.67	31.02 ± 27.59	0.090	33.33 ± 30.64	23.61 ± 28.77	34.26 ± 30.11	0.077	29.63 ± 28.83	29.17 ± 26.20	31.48 ± 24.31	0.874
p#	0.772	0.047	0.295		0.763	0.185	0.098		0.623	0.660	0.275	
Hormone therapy												
No (n= 16)	22.92 ± 23.47	25.00 ± 25.82	39.58 ± 25.00	0.170	33.33 ± 32.20	29.17 ± 34.16	35.42 ± 30.96	0.861	33.33 ± 34.43	37.50 ± 29.50	33.33 ± 27.22	0.925
Yes (n= 93)	24.73 ± 27.32	24.37 ± 26.98	27.24 ± 27.34	0.763	34.05 ± 29.07	25.81 ± 28.71	30.11 ± 29.51	0.197	30.11 ± 29.95	28.67 ± 25.82	29.03 ± 23.69	0.931
p#	0.803	0.931	0.094		0.929	0.675	0.511		0.672	0.219	0.513	

According to the multiple comparison test result (Bonferroni), the difference in alphabetical exponents indicates statistically significant.
p*: Repeated measure analysis of variance, p#: Student's t test, $\bar{x}$: Arithmetic mean, SD: Standard deviation, BCS: Breast conserving surgery, MRM: Modified radical mastectomy.

Table 10. Comparison of surgical technique and hormone therapy status and the mean score of EORTC QLQ-C30 cancer quality of life scale in the study

Variables	Constipation			p*	Diarrhea			p*	Financial difficulty			p*
	First day $\bar{x} \pm SD$	Last day $\bar{x} \pm SD$	Three months later $\bar{x} \pm SD$		First day $\bar{x} \pm SD$	Last day $\bar{x} \pm SD$	Three months later $\bar{x} \pm SD$		First day $\bar{x} \pm SD$	Last day $\bar{x} \pm SD$	Three months later $\bar{x} \pm SD$	
Surgery												
MRM (n= 37)	20.72 ± 28.71	30.63 ± 31.80	27.93 ± 28.88	0.345	25.23 ± 19.88	20.72 ± 21.30	20.72 ± 18.18	0.475	18.02 ± 25.57	17.12 ± 24.37	18.92 ± 21.57	0.918
BCS (n= 72)	19.91 ± 27.78	24.07 ± 25.77	27.31 ± 32.78	0.301	24.07 ± 25.16	25.46 ± 16.30	20.37 ± 19.02	0.334	16.67 ± 25.64	13.89 ± 21.49	18.98 ± 21.54	0.318
p#	0.886	0.249	0.924		0.809	0.199	0.927		0.795	0.480	0.989	
Hormone therapy												
No (n= 16)	12.50 ± 23.96[a]	25.00 ± 31.03[ab]	41.67 ± 41.28[b]	0.032	16.67 ± 17.21	27.08 ± 18.13	22.92 ± 20.07	0.290	18.75 ± 24.25	18.75 ± 27.13	8.33 ± 14.91	0.314
Yes (n= 93)	21.51 ± 28.51	26.52 ± 27.61	25.09 ± 28.93	0.759	25.81 ± 24.14	23.30 ± 18.25	20.07 ± 18.48	0.162	16.85 ± 25.83	14.34 ± 21.65	20.79 ± 21.93	0.068
p#	0.236	0.842	0.050		0.150	0.445	0.575		0.784	0.470	**0.008**	

According to the multiple comparison test result (Bonferroni), the difference in alphabetical exponents indicates statistically significant.
p*: Repeated measure analysis of variance, p#: Student's t test, $\bar{x}$: Arithmetic mean, SD: Standard deviation, BCS: Breast conserving surgery, MRM: Modified radical mastectomy.

Table 11. Comparison of the mean score of the EORTC QLQ-BR23 breast cancer-specific scale according to the surgical status and hormonal therapy in the study

Variables	Body image			p*	Future expectation			p*	Sex life			p*
	First day $\bar{x} \pm SD$	Last day $\bar{x} \pm SD$	Three months later $\bar{x} \pm SD$		First day $\bar{x} \pm SD$	Last day $\bar{x} \pm SD$	Three months later $\bar{x} \pm SD$		First day $\bar{x} \pm SD$	Last day $\bar{x} \pm SD$	Three months later $\bar{x} \pm SD$	
Surgery												
MRM (n= 37)	87.84 ± 18.38	86.71 ± 22.94	85.19 ± 18.59	0.875	67.57 ± 36.42	74.77 ± 38.81	77.48 ± 39.33	0.516	86.49 ± 17.50	91.89 ± 13.39	91.44 ± 16.49	0.249
BCS (n= 72)	86.34 ± 22.52	81.67 ± 22.32	84.90 ± 26.48	0.657	69.44 ± 35.71[ab]	63.43 ± 43.75[a]	80.56 ± 31.52[b]	0.021	81.48 ± 26.02	87.04 ± 17.07	89.12 ± 19.61	0.095
p#	0.728	0.273	0.955		0.797	0.186	0.659		0.295	0.135	0.539	
Hormone therapy												
No (n= 16)	83.85 ± 22.66	82.81 ± 20.74	89.29 ± 17.73	0.643	70.83 ± 38.25	60.42 ± 45.90	79.17 ± 34.16	0.472	80.21 ± 32.90	86.46 ± 22.13	81.25 ± 25.73	0.797
Yes (n= 93)	87.37 ± 20.95	83.52 ± 22.97	84.34 ± 24.81	0.575	68.46 ± 35.57	68.46 ± 41.81	79.57 ± 34.41	0.059	83.69 ± 21.70[a]	89.07 ± 14.85[b]	91.40 ± 16.78[b]	**0.013**
p#	0.542	0.909	0.475		0.808	0.485	0.966		0.587	0.550	**0.043**	

According to the multiple comparison test result (Bonferroni), the difference in alphabetical exponents indicates statistically significant.
p*: Repeated measure analysis of variance, p#: Student's t test, $\bar{x}$: Arithmetic mean, SD: Standard deviation, BCS: Breast conserving surgery, MRM: Modified radical mastectomy.

Table 12. Comparison of the mean score of the EORTC QLQ-BR23 breast cancer-specific scale according to the surgical status and hormonal therapy in the study

Variables	Sexuel satisfaction			p*	Side effect			p*	Hair loss			p*
	First day x̄ ± SD	Last day x̄ ± SD	Three months later x̄ ± SD		First day x̄ ± SD	Last day x̄ ± SD	Three months later x̄ ± SD		First day x̄ ± SD	Last day x̄ ± SD	Three months later x̄ ± SD	
Surgery												
MRM (n= 37)	75.68 ± 27.94[a]	90.09 ± 19.03[b]	88.29 ± 19.59[b]	**0.019**	35.60 ± 19.42	37.14 ± 23.29	35.65 ± 23.02	0.956	36.63 ± 26.50	40.54 ± 26.22	34.23 ± 28.85	0.174
BCS (n= 72)	77.31 ± 30.04[a]	89.81 ± 18.25[b]	86.11 ± 22.90[ab]	**0.011**	35.32 ± 22.17[a]	43.98 ± 24.76[b]	34.66 ± 21.57[a]	**0.030**	35.65 ± 30.81[ab]	44.44 ± 27.41[a]	33.80 ± 26.53[b]	**0.045**
p#	0.783	0.942	0.623		0.751	0.155	0.930		0.401	0.476	0.937	
Hormone therapy												
No (n= 16)	68.75 ± 33.26	89.58 ± 20.07	81.25 ± 27.13	0.143	36.90 ± 24.62	44.94 ± 25.43	36.01 ± 18.48	0.492	31.25 ± 30.96[ab]	52.08 ± 27.13[a]	20.83 ± 23.96[b]	**0.007**
Yes (n= 93)	78.14 ± 28.44[a]	89.96 ± 18.25[b]	87.81 ± 20.73[b]	**0.002**	35.53	± 20.72	41.18 ± 24.31	34.80 ± 22.59	0.117	34.41 ± 29.26	41.58 ± 26.76	36.20 ± 27.21
p#	0.237	0.940	0.267		0.818	0.557	0.810		0.693	0.151	**0.036**	

According to the multiple comparison test result (Bonferroni), the difference in alphabetical exponents indicates statistically significant.
p*: Repeated measure analysis of variance, p#: Student's t test, x̄: Arithmetic mean, SD: Standard deviation, BCS: Breast conserving surgery, MRM: Modified radical mastectomy.

functionality, and the authors have stated that, among the QLQ-BR23 scales, there were systemic treatment side effects, perspective on the future, and discomfort with hair loss (9). In other studies, it has been reported that adjuvant radiotherapy did not affect the quality of life in patients with breast cancer (11,14).

It has been reported that removal of all or part of the breast often causes women to experience distress and difficulties such as depression and affective disorders, loss of sexual desire, deterioration in body image, loss of femininity, and difficulty in finding suitable clothes (15,16). In our study, the results of the quality-of-life questionnaire were found to be better in the BCS group. These values were found to be significant for physical function, future expectation, and dyspnea variables. The reason for the higher incidence of dyspnea in patients who underwent MRM was attributed to the entry of the lung into the treatment area. In our study, it was thought that the statistical significance in other parameters, that is, the fact that most of them were not significant, was because the operation types were not equal in number.

Radiation damages both the lymph nodes and indirectly the lymphatic vessels, reducing the carrying capacity of the lymphatic system and causing the development of lymphedema. Especially, patients who receive radiotherapy after radical mastectomy are stated to be at the highest risk in terms of lymphedema (9,12). In our study, it was seen that the problems related to the arm were higher in patients with MRM than in the BSC group. In addition, it was observed that future expectations were lower. The results of the study of Montazeri et al. are similar to the results of our study (17). In a study conducted by Pyzel et al. with the EORTC QLQ-C30 quality of life scale, they have reported that patients with arm edema have more physical, mental and social status disorders, and that pain and fatigue are felt more (18).

In our study, in the findings related to the QLQ-BR23 quality of life scale, it was determined that the scores of the subjects in the subgroups of future expectation, sexual satisfaction, hair loss, and arm-related problems increased significantly. Body image and high future expectations suggest that the individual wishes to meet his/her social needs throughout his/her life. In a study, it was reported that 55% of existing psychosexual disorders occur after surgery, 24% after chemotherapy and 1% after radiotherapy. These results show that invasive surgical treatment methods deeply affect the psychosexual lives of Turkish women. Possible reasons for the low rate of psychosexual disorders in Turkish women may be low sexual expectation and shyness in answering the questionnaire due to cultural and social characteristics (19).

Table 13. Comparison of the mean score of the EORTC QLQ-BR23 breast cancer-specific scale according to the surgical status and hormonal therapy in the study

Variables	Arm related problems			p*	Breast related problems			p*
	First day $\bar{x} \pm SD$	Last day $\bar{x} \pm SD$	Three months later $\bar{x} \pm SD$		First day $\bar{x} \pm SD$	Last day $\bar{x} \pm SD$	Three months later $\bar{x} \pm SD$	
Surgery								
MRM (n= 37)	8.95 ± 11.52	6.17 ± 8.99	5.25 ± 9.00	0.230	43.69 ± 12.17	42.79 ± 13.35	45.05 ± 14.36	0.787
BCS (n= 72)	14.04 ± 19.47[a]	9.41 ± 10.66[a]	4.01 ± 7.76[b]	**<0.001**	43.06 ± 15.95	41.09 ± 11.13	43.98 ± 13.14	0.413
p#	0.151	0.098	0.510		0.831	0.481	0.699	
Hormone therapy								
No (n= 16)	17.36 ± 23.30	11.11 ± 12.83	4.86 ± 9.04	0.148	44.27 ± 14.50	41.67 ± 13.61	43.75 ± 12.36	0.842
Yes (n= 93)	11.47 ± 16.09[a]	7.85 ± 9.68[a]	4.35 ± 8.06[b]	**<0.001**	43.10 ± 14.83	41.67 ± 11.66	44.44 ± 13.76	0.380
p#	0.212	0.227	0.801		0.770	1.000	0.850	

According to the multiple comparison test result (Bonferroni), the difference in alphabetical exponents indicates statistically significant.
p*: Repeated measure analysis of variance, p#: Student's t test, $\bar{x}$: Arithmetic mean, SD: Standard deviation, BCS: Breast conserving surgery, MRM: Modified radical mastectomy.

When the literature was examined, no study was found examining the quality of life of hormone therapy. In our study, it was seen that hormone therapy had an effect only on constipation according to the EORTC QLQ-C30 questionnaire. Other parameters were found to be affected. On the other hand, in QLQ-BR23 breast scale, positive results were obtained in sexual satisfaction and arm related problems. It was thought that hormone therapy could increase the problems related to the arm due to radiotherapy.

CONCLUSION

As a result, radiotherapy has an important place in the treatment of breast cancer. As with all treatment methods, radiotherapy also has side effects. Radiotherapy can cause fatigue, nausea, and vomiting, and therefore, a decrease in work force and a decrease in quality of life can be observed. As seen in this study, other than radiotherapy, hormone therapy and surgical techniques were found to be effective on quality of life. Thanks to this information obtained, it will be easier to make the necessary medical and social interventions to achieve a better quality of life.

Ethics Committee Approval: This study was approved by Erciyes University Clinical Research Ethics Committee (Decision no: 2016/177, Date: 04.03.2016).

Peer-review: Externally peer-reviewed.

Author Contributions: Concept - YBC, OÖ; Design - YBC, OÖ; Supervision - YBC, OÖ; Fundings - YBC, OÖ; Materials - YBC, OÖ; Data Collection and/or Processing - YBC, OÖ; Analysis and/or Interpretation - YBC, OÖ; Literature Search - YBC, OÖ; Writing Manuscript - YBC, OÖ; Critical Reviews - YBC, OÖ.

Conflict of Interest: The authors have no conflicts of interest to declare.

Financial Disclosure: The authors declared that this study has received no financial support.

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ORİJİNAL ÇALIŞMA-ÖZET
Turk J Surg 2023; 39 (3): 237-248

Radyoterapi alan meme kanseri hastalarında cerrahi ve hormon tedavisinin yaşam kalitesine etkisi

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ÖZET

Giriş ve Amaç: Bu çalışmanın amacı radyoterapi alan meme kanserli hastalarda cerrahi tipi ve hormon tedavisinin genel yaşam kalitesi üzerine etkisini incelemektir.

Gereç ve Yöntem: Meme kanseri nedeniyle adjuvan radyoterapi uygulanılan toplam 109 hasta çalışmaya alındı. Prospektif gözlemsel bir çalışma olarak planlandı. Araştırma için etik kurul onayı alındı. Araştırmada veri toplama aracı olarak birinci bölümde demografik ve klinik özellikleri belirten form, ikinci bölümde ise Avrupa Kanser Araştırma ve Tedavi Teşkilatı tarafından geliştirilmiş "EORTC QLQ-C30" ve meme kanserine özgü "EORTC QLQ-BR23" Türkçe yaşam kalitesi formları kullanıldı. Bu veriler hastalarla yüz yüze görüşülerek toplandı. Hastalardan radyoterapinin birinci günü, son günü ve tedavi bitiminden üç ay sonra anket formlarını doldurmaları istendi.

Bulgular: Bu çalışmanın yaş ortalaması 54,8 ± 12,1 yıldı. En sık yapılan ameliyat meme koruyucu cerrahi idi. Hastaların %85,3'ü hormon tedavisi alıyordu. Radyoterapi birinci günü, son günü ve üç ay sonra yapılan anketlerde EORTC QLQ-C30 ölçeğine göre en yüksek puan sosyal ve kognitif fonksiyonda, EORTC QLQ-BR23 ölçeğinde ise cinsel yaşamda görüldü. Çoklu karşılaştırma testine göre ilk gün radyoterapi alan hastaların radyoterapiden üç ay sonraki ölçümlerine göre fiziksel fonksiyon ortalaması (p= 0,049), gelecek beklentisi (p= 0,033), cinsel yaşam (p= 0,029), cinsel tatmin (p< 0,001), saç dökülmesi (p= 0,011) ve kola bağlı sorunlar (p< 0,001) değişkenlerinin ortalama farkları anlamlı bulundu. Tekrarlı ölçümlerde varyans analizine göre cerrahi tipine göre fiziksel fonksiyon, cinsel yaşam, yan etkiler, saç dökülmesi, dispne ve gelecek beklentisi; hormon tedavisinde ise cinsel yaşam, saç dökülmesi, kabızlık ve ekonomik zorluk istatistiksel olarak anlamlı idi.

Sonuç: Meme kanseri nedeniyle radyoterapi alan hastalarda yaşam kalitesi üzerinde radyoterapiden başka hormon tedavisi ve yapılan cerrahi tekniklerin de etkili olduğu görüldü.

Anahtar Kelimeler: Meme kanseri, radyoterapi, hormon tedavisi, cerrahi, yaşam kalitesi, QLQ-C30, QLQ-BR23

DOİ: 10.47717/turkjsurg.2023.6087