Research Paper

Effectiveness of Cognitive-behavioral Stress Management on the Quality of Life of Women With Breast Cancer in Sari

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ABSTRACT

Background and Objective: Breast cancer is one of the leading causes of death in women worldwide. Traditional treatment methods for breast cancer often disrupt the quality of life (QOL) of patients. Therefore, oncology care has shifted towards improving the QOL of cancer patients. This study aims to investigate the effectiveness of cognitive-behavioral stress management (CBSM) therapy on the QOL of women with breast cancer in Iran.

Materials & Methods: This is a quasi-experimental study with a pre-test, post-test, and follow-up design. Participants were 30 women aged 30-50 years with breast cancer (stage 1-2) referred to Imam Khomeini Hospital and Baghban Clinic in Sari, Iran. They were selected using a convenience sampling method and were randomly assigned to intervention and control group. Both groups completed the short form of the World Health Organization QOL scale (WHOQOL-BREF). The intervention group participated in ten 120-minute sessions of group CBSM. Immediately after and one month after the intervention, both groups were re-evaluated and the data were analyzed using the repeated measures ANOVA in SPSS software, version 22.

Results: The CBSM significantly improved the QOL of women ($P<0.05$). This effect maintained for one month.

Conclusion: The CBSM therapy can effectively improve the QOL of Iranian women with breast cancer, which can enable them to cope better with the treatment process.

Keywords: Cognitive behavioral therapy, Stress management, Breast cancer, Quality of life (QOL)

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Introduction

Breast cancer is a condition where cells in breast tissue grow abnormally [1]. It is currently the leading cause of death in women worldwide [2]. In Iran, breast cancer is also prevalent among women, especially in those aged 40-50. Thanks to advancements in diagnosis and treatment, the survival rate of patients with breast cancer has increased. Five-year and ten-year breast cancer survival rates are 90% and 80%, respectively. However, the survivors have to cope with the physical and psychological effects of their disease and treatment [3]. Patients with breast cancer have a poor quality of life (QOL). The QOL refers to the level of satisfaction with physical, emotional, and social abilities. It is crucial to identify the factors related to the QOL and better understand the health status of patients with chronic diseases. Patients with breast cancer have a poor QOL. In this regard, the QOL of cancer patients has become the primary focus of care in the field of oncology [4]. Among the common treatment methods for breast cancer, chemotherapy has a more negative effect on the QOL of patients. It disrupts physical, mental, social, and spiritual health, leading to reduced QOL [5].

Cancer evaluation and treatment can be very stressful, leading to the emergence of psychological symptoms that can exacerbate the disease, prolong the recovery process, and reduce the well-being of patients and their caregivers [6]. A variety of individual and environmental factors influences the perception of a stressful situation. These factors include the person's thoughts, attitudes, and past experiences, all contributing to their overall perception of the situation. This, in turn, can lead to a range of physical, cognitive, and behavioral symptoms [7]. Cognitive-behavioral stress management (CBSM) therapy is a type of stress management method that is based on cognitive-behavioral therapy (CBT) and was developed by Beck [8] and Ellis [9] and to help people develop skills to reduce stress and cope more effectively with stressful situations [10]. The CBSM involves a range of techniques, such as increasing awareness of stress, learning relaxation skills, identifying unhelpful thoughts, restructuring cognitive processes, problem-solving training, building effective coping mechanisms, anger management, and improving self-expression [11].

Several studies have focused on the QOL of women with breast cancer. These studies have evaluated the effectiveness of various psychosocial interventions aimed at improving their QOL. Some of these interventions include written exposure therapy, mindfulness-based stress reduction [12], acceptance and commitment therapy [13], 5A model-based self-management program [14], and emotion-focused therapy [15]. Two systematic reviews of randomized controlled trials on the effect of CBT on the QOL of patients with breast cancer [4] and non-metastatic breast cancer [15] showed that the impact of CBT on the QOL of patients with breast cancer was moderate. However, there are contradictory results about the effect of cognitive-behavioral interventions on the QOL of women with breast cancer.

While there are several national and international studies on the efficts of cognitive-behavioral interventions on the QOL, including CBSM, this is the first study that was conducted in Mazandaran Province of Iran. The cultural and social context can have a significant impact on the QOL. This study aims to assess the effectiveness of CBSM therapy in improving the QOL of women with breast cancer in Sari, Iran.

Materials and Methods

This is an open-label randomized controlled clinical trial with a pre-test/post-test/follow-up design The study population consists of all women at early stages (stage 1-2) of breast cancer aged 30-50 years referring to Imam Khomeini Hospital and Baghban Clinic in Sari City. The sample size was determined 24 using G*Power software, version 301 at a 95% confidence interval (CI) and a test power of 80% according to a previous study [16]. Thirty samples were selected using non random available sampling and based on the entry and exit criteria and randomly divided into two groups of intervention and control. Seven women (out of 30), including three women from the intervention group (due to frequent absences) and two women from the control group (due to noncooperation), were excluded from the study. Therefore, the study was performed on 12 women in the intervention group and 13 in the control group.

The criteria for entering the study included age 30-50 years, non-metastatic breast cancer (stages 1-2), mastectomy surgery, 6-12 months have passed since the surgery, and consent to participate in the study. The exclusion criteria were unwillingness to continue participation in the sessions, having a mental disorder, absence from more than two intervention sessions, recurrence of the disease and suffering from a physical disease during the intervention.

The data collection tools were a demographic form and the short form of the World Health Organization QOL scale (WHOQOL-BREF), which is a 26-item tool

Table 1. Protocol of group CBSM therapy

Sessions	Topic	Homework
1	Introducing the goals and expectations, discussing the relationship of stress and anxiety with biological processes and the benefits of stress management, progressive relaxation training for 7 muscle groups	Daily activity record sheet, stress and sleep monitoring sheet
2	Introducing the concept of stress management, increasing awareness about physical responses to stressful events, progressive relaxation training for 4 muscle groups	Stress and sleep monitoring sheet
3	Introducing automatic thoughts and beginning to identify cognitive distortions	Stress and sleep monitoring sheet
4	Learning to replace rational thought using stress management skills (cognitive restructuring)	Stress and sleep monitoring sheet, cognitive restructuring
5	Introducing coping theory, increasing awareness of various coping styles	Stress and sleep monitoring sheet, coping style
6	Teaching and practicing effective coping, softening meditation, acceptance steps for overwhelming stressors	Stress and sleep monitoring sheet, coping style
7	Identifying beneficial and harmful social resources, learning new strategies to improve and expand support networks, Introducing mantra meditation	Stress and sleep monitoring sheet
8	Identifying anger patterns, learning new strategies to assess and manage anger	Stress and sleep monitoring sheet completion, Anger management sheet
9	Assertiveness training, increasing the number and variety of situations that cause expressive behaviors, reducing the situations and conditions in which passive or aggressive behaviors occur.	Stress and sleep monitoring sheet, communication skills monitoring sheet
10	Wrap-up, answering questions, and review	Summarizing

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and has four subscales (physical health, psychological health, social relationships, and environment) and one general scale (general health). The items are rated on a Likert scale from 1 to 5. The total score ranged 7-35 for physical health, 6-30 for psychological health, 3-15 for social relationships, 8-40 for environment and 2-10 for general health. Nejat et al. [17] translated this scale into Persian and reported its acceptable validity and reliability (Cronbach's α=0.84). Also, the factor analysis approved the four-factor structure of the scale. Also, a study was conducted on 1167 people with chronic and non-chronic patients in Tehran using this scale. Test-retest reliability for the subscales was reported as follows: 0.77 for physical health, 0.77 for psychological health, 0.75 for social relationships, and 0.84 for environment.

After obtaining ethical approval from the university and informed consent from the participants, both groups completed the WHOQOL-BREF. Then, group CBSM therapy was conducted in the intervention group at ten sessions of 120 minutes based on Antoni's protocol translated into Persian by Safarzadeh et al. [18], in the conference room of Imam Khomeini Hospital in Sari. The post-test assessments were conducted immediately and one month after the end of the intervention. In similar studies, follow-up were conducted after one month [19], two months [18] and six months [20]. In this study, one month was determined because some women would finish the challenging course of chemotherapy after one month, and the subsequent changes could affect the results. Table 1 presents the protocol of the CBSM therapy. In all sessions, there was both behavioral intervention (relaxation) and cognitive training, but in the first two sessions, progressive muscle relaxation was also taught, and the subsequent sessions, started with relaxation exercises.

Statistical analysis

Descriptive and inferential statistics methods were used for data analysis in SPSS software, version 26. The significant level was set at 0.05. Repeated measures analysis of variance (ANOVA) followed by Bonferroni post hoc test for pairwise comparison was used for data analysis. Before conducting the analysis, Mauchly's test of sphericity for assumption of sphericity, Kolmogorov-Smirnov and Shapiro-Wilk tests for the normality of the data, and Levene's for assumption of equality of variances were conductd. The Kolmogorov Smirnov and Shapiro-Wilk tests confirmed the normality of the data. Levene's test also confirmed the equality of variances in two groups (P>0.05). However, the assumption of sphericity was not confirmed by Mauchly's test for the QOL variable (P<0.001). Therefore, Greenhouse-Geisser correction was used to report the F ratio.

Table 2. Demographic characteristics of two study groups

Characteristics		No. (%)		P*
		Intervention	Control	
Educational level	Diploma	3(25)	3(23.1)	0.22
	Bachelor's degree	6(50)	7(53.8)	
	Master's degree	3(25)	3(23.1)	
Marital status	Married	10 (83.3)	11(84.6)	0.672
	Single or widowed	2(16.7)	2(15.4)	
Number of children	0	1(8.3)	2(15.4)	0.621
	1	4(33.3)	5(38.5)	
	2	7(58.3)	6(46.2)	
Occupation	Employed	3(25)	4(30.8)	0.55
	Retired or housekeeper	9(75)	9(69.2)	
History of chemo-therapy	Yes	6(50)	7(53.8)	0.582
	No	6(50)	6(46.2.2)	
History of radio-therapy	Yes	4(33.3)	4(30.8)	0.613
	No	8(66.7)	9(69.2)	

*Chi-square test

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Results

There was no significant difference between the two groups in demographic characteristics according to the results of chi-square test reported in Table 2 (P>0.05). In terms of age, no significant difference was reported between the two groups, either (P=0.971). The mean age in both groups was about 44 years, ranged 30 to 50 years. The age range in the intervention group was 32-50 years, while in the control group, it was 34-50 years. Most of the participants were housekeepers and had two children. In terms of the type of treatment received after surgery, 50% had chemotherapy and 33.3% had radiation therapy in the intervention group. These percentages in the control group were 53.8% and 30.8%, respectively (P>0.05). Figure 1 compares the two groups in terms of demographic characteristics.

As shown in Table 3, the mean score of the QOL in the pre-test phase in both control and experimental groups is very close to each other. In the post-test and follow-up phases, there were considerable differences between the two groups, which are illustrated in Figure 2. According to the results of repeated measures ANOVA shown in Table 4, the F value for the effect of time (pre-test, post-test and follow-up) was statistically significant (P≤0.01). The interaction effect of time and group was also significant. Therefore, there was a significant difference in the mean scores of QOL over time.

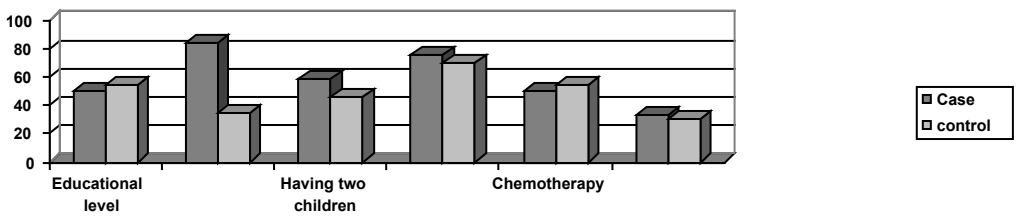

Figure 1. Comparison of demographic characteristics between the two groups

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Table 3. Mean scores of the QOL scale in the pre-test, post-test and follow-up phases

Group	Subscales	Mean±SD		
		Pre-test	Post-test	Follow-up
Control	Overall QOL	1 40.46±1.9	41±9.5	40.7±10.6
	Physical health	38.6±7.9	38.8±6.7	39±6.8
	Psychological health	40±10.4	40.69±9.1	40.46±9.6
	Social relationships	61.9±12	60.07±8.9	60±8.98
	Environment	56±18.2	51.4±12.9	56.5±12.8
Intervention	Overall QOL	37.1±10.9	66.4±12.3	66.4±12.3
	Physical health	37.08±7.6	61.9±9.8	61.9±9.8
	Psychological health	38.9±10.5	67.08±9.7	67.08±9.7
	Social relationships	60.08±10.7	72.3±12	72.4±12.5
	Environment	52.08±18	66.8±12.2	65.6±13.3

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Table 4. Results of repeated measures (mixed) ANOVA

Variables	Source of Changes	Sum of Squares	df	Mean Square	F	Sig.	Effect Size	Test Power
Overall QOL	Group	5083.329	1	5083.329	15.158	0.001	0.397	0.961
	Time	3882.7	1.327	2925.00	109.927	<0.001	0.827	1
	Group×time	3666.113	1.327	2761.836	103.837	<0.001	0.819	1
Physical health	Group	4250.488	1	4250.488	167.84	<0.001	0.513	0.997
	Time	2709.55	1.18	2284.489	159.935	<0.001	0.879	1
	Group×time	2581.923	1.18	2176.884	24.223	<0.001	0.874	1
Psychological health	Group	5699.449	1	5699.449	21.508	<0.001	0.483	0.993
	Time	3488.277	1.07	3254.017	168.574	<0.001	0.88	1
	Group×time	3214.677	1.07	2998.791	155.352	<0.001	0.871	1
Social relationships	Group	1077.137	1	1077.137	3.255	0.084	0.124	0.409
	Time	453.914	1.007	450.580	15.82	<0.001	0.408	0.968
	Group×time	831.514	1.007	825.406	28.98	<0.001	0.558	0.999
Environment	Group	1361.374	1	1361.374	2.265	0.146	0.09	0.303
	Time	383.751	1.019	376.661	6.416	0.018	0.218	0.685
	Group×time	1471.751	1.019	1444.559	24.607	<0.001	0.517	0.998

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Table 5. Pair wise comparison of the time points using the Bonferroni test for the QOL

Group	Variables	Time Points	Mean±SD Difference	Sig.	95% CI	
					Lower	Upper
Intervention	Overall QOL	Post-test and pre-test	30.9±2.8	0.000	23.01	38.8
		Post-test and follow-up	1.66±1.2	0.623	-1.84	5.17
	Physical health	Post-test and pre-test	25.5±1.9	0.000	21.39	29.7
		Post-test and follow-up	0.75±0.68	0.298	-0.76	2.26
	Psychological health	Post-test and pre-test	28.58±2.28	0.000	23.55	33.6
		Post-test and follow-up	0.41±0.43	0.358	-0.54	1.37
	Social relationships	Post-test and pre-test	12.25±2.45	0.000	6.85	17.64
		Post-test and follow-up	0.83±0.19	0.674	-0.5	0.341
	Environment	Post-test and pre-test	14.75±3.51	0.02	7.006	22.49
		Post-test and follow-up	1.16±0.44	0.003	0.19	2.13
Control	Overall QOL	Post-test and pre-test	0.538±0.852	1	-1.83	2.9
		Post-test and follow-up	0.231±0.455	1	-1.03	1.49
	Physical health	Post-test and pre-test	0.23±0.6	0.7	-1.07	1.54
		Post-test and follow-up	-0.154±0.1	0.16	-0.38	0.073
	Psychological health	Post-test and pre-test	0.69±0.536	0.22	-0.47	1.86
		Post-test and follow-up	0.23±0.257	0.38	-0.32	0.79
	Social relationships	Post-test and pre-test	-1.84±1.09	0.11	-4.23	0.54
		Post-test and follow-up	0.000	0.000	0.000	0.000
	Environment	Post-test and pre-test	-4.61±1.64	0.16	-8.19	-1.03
		Post-test and follow-up	0.000	0.000	0.000	0.000

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The Bonferroni post hoc test was used to investigate the difference in the means between three time points. As shown in Table 5, the differences between the post-test and pre-test scores in the intervention group were higher and significant (P≤0.05), which indicates the effectiveness of CBSM therapy. The differences between the post-test and follow-up scores in the intervention group were not significant (P>0.05), indicating that the effect was maintained for one month. There was no significant difference between any time points in the control group.

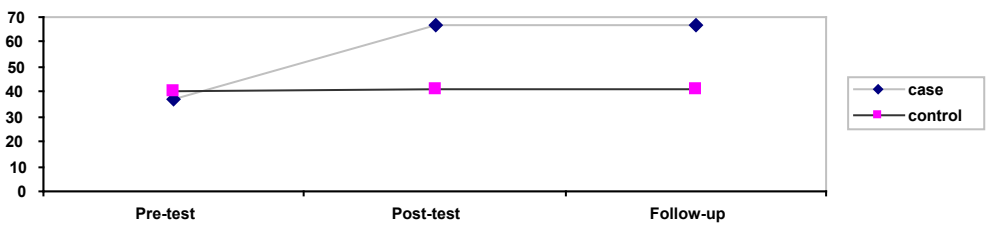

Figure 2. Comparison of the QOL scores at three time points between the two groups

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Discussion

In this study, we found that the group CBSM therapy significantly increased the QOL scores of the intervention group. Therefore, it can be said that CBSM therapy is effective in improving the QOL of women with breast cancer. This is consistent with the results of Safarzadeh et al. [18], Getu et al. [4], Mohammadizadeh et al. [13], Habibi et al. [21], Shayan et al. [22], Rezaei Ardani et al. [23], Mohammadi Arya et al. [24] and Antoni et al. [25].

The intervention protocol was adapted from Antoni et al.'s study [20] and the QOL was measured by the WHOQOL-BREF. In other studies on the effect of CBSM on the QOL of breast cancer patients, different tools were used including the 12-item short form survey [21]; EORTC core QOL questionnaire (QLQ-C30) [18] and 36-item short form survey [24-26]. In one study [11], although the same tool was used for measuring QOL, the protocol was different from that of the present study. Also, in most of the related studies, the age range of participants was 20-60 years, while the age range was 30-50 years in our research.

In two systematic review studies on patients with breast cancer [4] and non-metastatic breast cancer [15], the effect of CBT on the QOL was reported to be moderate. However, this study showed that the CBSM therapy had a significant effect on the QOL of women with breast cancer. To explain the findings, it can be said that in the CBSM therapy, patients are taught to identify their sources of stress, evaluate and distinguish between positive and negative thoughts, identify the cause of these thoughts, and replace negative thoughts with rational thoughts. Also, emotional symptoms are managed by relaxation techniques. Therefore, by increasing the patients' awareness of their thoughts and their connection with stress, it leads to reduced stress and thus improved QOL in various dimensions, especially physical and mental health.

Following the diagnosis of breast cancer, women suffer from various concerns, such as fear of death, worry about the treatment process and negative effect on appearance, the ability to perform daily tasks, and marital relations, and worry about its recurrence. Most of these women are in the age range of 40-50 years. In this age range, women are engaged in many family and social roles; therefore, breast cancer and its common treatments affect different aspects of the QOL [26]. By the CBSM, the stress can be managed step by step with relaxation training, and the underlying thoughts that cause stress are controlled by cognitive-behavioral methods, including paying attention to automatic thoughts, cognitive restructuring, assertiveness training, and learning effective ways to receive social support.

Conclusion

The CBSM can improve the QOL of women with breast cancer, and this effect can be maintained for one month. It can play an essential role in the treatment of breast cancer patients. It is recommended to conduct long-term studies using longer follow-up periods in the future. Also, it is recommended that future studies use a single-subject or qualitative design (based on the grounded theory using semi-structured interviews) to investigate the effectiveness of CBSM. The CBSM workshops for obstetrics and gynecology specialists and oncologists can be beneficial for providing quality care to women.

Ethical Considerations

Compliance with ethical guidelines

This study was approved by the Ethics Committee of Islamic Azad University, Sari Branch (Code: IR.IAU.SARI.REC.1402.047).

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Authors' contributions

Investigation and writing the initial draft: Fatemeh Toghani; Supervision, project administration, review and editing: Bahram Mirzaian and Ehsan Zaboli;Statistical analysis: Farzaneh Amin; Final approval: All authors.

Conflict of interest

The authors declared no conflict of interest.

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