RESEARCH ARTICLE

Effectiveness of Training the Couples on the Anxiety of Patients with Breast Cancer and Their Spouses: A Quasi-Experimental Study

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Abstract

Introduction: Breast cancer not only affect physical and mental status of the patient intensively but also her spouse. Anxiety is one of the most common mental disorders among patients and their spouses. This study aimed to determine the effectiveness of training couples on the anxiety of patients with breast cancer and their spouses. **Materials and methods:** This quasi-experimental study was carried out on eighty patients with breast cancer and their spouses who were referred to teaching hospitals of Zahedan University the Medical Sciences in 2022. Participants were divided into two groups intervention and control. The intervention group received three sessions of couples training. Three months after finishing the intervention, the data were gathered by Spielberger's state-trait anxiety. The data were analyzed using SPSS version 27. **Results:** Results of this study indicated that the mean and the standard deviation of the patient's anxiety score in the intervention and the control group have changed from $50.27\pm6,64$ and 49.97 ± 7.09 to 50.42 ± 6.18 and 38.70 ± 3.50 respectively. The mean and the standard deviation of the spouses scores ('patients' husbands) in the intervention group and the control group have changed from 50.70 ± 4.94 and 52.7 ± 6.67 to 51.35 ± 4.91 and 39.55 ± 2.89 respectively. Independent T-test showed that there was a significant difference regarding the mean and the standard deviation of the 'Spouse's anxiety score between the intervention group and the control group after carrying out the couples training intervention ($p<0.001$). **Conclusion:** ''This study' 's results showed that spouses' participation in training sessions can lower patient's anxiety. Making the spouses more active in patients' care process empowers them and increases their efficiency to tolerate crisis, which finally decreases their anxiety.

Keywords: Spouses- Breast Neoplasms- Anxiety- Mental Disorders

Introduction

Cancer is a complicated genetic disease, diagnosed by the excessive division of a normal cell and turning it into cancer cells capable of changing the related tissues and organs physiologically [1]. Breast cancer is the malignant division of the mammary cells that cover the lobules [2]. New estimations from the International Agency for Research on Cancer show that breast cancer, with two or three million new cases in 2020, has turned into the most common kind of cancer regarding cancer incidence universally [3]. In Iran, 12.9% of the diagnosed cancers in 2020 were patients with breast cancer. It has been the highest cancer incidence rate among all cancers in Iran [4].

Patients with breast cancer suffer from many mental disorders such as unmet physical needs, emotional stress, lifestyle changes, fear of death and loneliness, sexual intercourse anxiety, financial problems, long-term chemotherapy and mastectomy effects [5-9]. It is said that patients with breast cancer have more mental disorders than other cancer patients which makes them encounter other cancers [10].

Breast cancer problems not only affect the patients but also make their spouses worry about cancer return or treatment even more than the patients [11]. Diagnosing breast cancer in women can have adverse mental effects on their spouses. Results of the studies have shown that spouses of women with breast cancer have reported mental stress, a decline in sexual satisfaction and performance and lower quality of life [8, 9, 12-14]. Generally, sadness, depression and anxiety are some of the natural reactions and also mental stresses due to diagnosis and treatment [15]. Anxiety has been identified as the most important mental disorder of patients with breast cancer and

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their spouses [16]. Anxiety is a behavioural condition that shows itself without any external stimulus. This unpleasant and often vague condition includes automatic nervous system signs like dyspnea, heartbeat, sweating, headache, digestive disorders and restlessness [17]. The study of Nikbakhsh et al. [18] showed that there was a relationship between anxiety intensity and cancer type. it also indicated that patients with breast cancer and gastric cancer suffered from the highest anxiety respectively [18]. Patients with breast cancer have had the highest anxiety due to reasons like hair loss, weight gain and post-operative scars [19]. Spouses of patients with breast cancer also have high anxiety [20] and sometimes even higher levels of anxiety than the patients [12]. The most common reasons for a spouse's anxiety were due to medical visits, treatment and clinical procedures [19]. Spouse anxiety as an impeding factor causes the patients to be deprived of their spouse's support and caregiving when they need them more than ever. If spouses have a mentally acceptable level, they will have more successful caregiving leading to better adaptation to the disease [21]. Various studies have confirmed the abovementioned points and have indicated that social support for women during different treatment stages leads to better mentality and treatment consistency in which spouses have a critical role [22, 23]. The results of the study of Zare Abadi et al. [24] have shown that if their spouse and other caregivers support them more, they are more dedicated to cancer treatment [24].

Having considered the spouse's caregiving role of the patients with breast cancer, carrying out a teaching intervention including active participation of patients and their spouses will decrease their anxiety. This teaching intervention involves teaching and counselling to increase 'couples' awareness level, control cancer complications, crisis, and create empathy for lowering their anxiety, so the current study aims to evaluate the effectiveness of teaching couples on the anxiety of patients with breast cancer and their spouses was carried out.

Materials and Methods

This quasi-experimental study was carried out on eighty breast cancer patients receiving chemotherapy and their spouses who were referred to Imam Ali and Khatam Al Aniba hospitals of the Zahedan University of medical Sciences in 2022. Patients and their spouses who had the inclusion criteria were identified and they were divided into the intervention group and control group by simple random sampling method.

The sample size was taken from the mean and the standard deviation of spouses' anxiety scores in the study of Rafiee et al [25]. The probability level was 95% with a statistical test power of 95% based on the upcoming formula. Forty patients were given to each group eight patients total. The participant's inclusion criteria included diagnosis of breast cancer in grade 2 or 3, being 25 to 65 years old, and having the ability to read and write.

Exclusion criteria included couples' lack of satisfaction to continue the study, absence in a teaching session and patients' metastasis during the study. The data-gathering tool of this study was a questionnaire comprised of two parts:

a. Patient and her spouse demographic data including age, education, job, children number

b. Spielberger State Anxiety Questionnaire..

State anxiety includes twenty sentences that evaluate individuals' feelings at the time of responding. Each phrase of this test is graded from 1 to 4 based on the given response and 10 phrases are scored in this way. A score of 4 indicates a high level of anxiety. To score the other remaining phrases, a higher score means a lack of anxiety, the scores of every respondent can range from 20 to 80. Interpretative criteria of the state anxiety based on state anxiety test normality research are the following:

Scores of 20-31 indicate mild anxiety, 32-42 moderate to mild anxiety, 43-53 moderate to severe, 54-64 relatively severe, 65-76 severe and a score of 76 and more is very severe. Khanipoor obtained a consistent coefficient of 0.66 for Spielberger state-trait anxiety using Cronbach Alpha. The internal consistency of the tool was valid from 0.86 to 0.95 in the research on adults, university students and army-called personnel. It has also been reported that 0.77 for students and 0.70 for university students using the test-retest method [26].

Having obtained letters of introduction from the research and technology committee of the Medical Sciences University of Zahedan, the researchers went to the related hospitals to get permission from each hospital administration to carry out the research in the related wards and gather the data. Participants were selected according to the inclusion criteria. Participants were selected according to the inclusion criteria. They were divided into two groups using simple random sampling method. The intervention group was given blue cards,, and the control group was given red cards. Later, the researcher introduced himself/ herself, stated the objectives and methods of the research, and obtained written consent from the patient and her spouse to be included in the research. First patients or their spouses in both the control group and the intervention group filled out the demographic form including (the patient's age, spouse's age, patient education, spouse's education, patient's job, spouse's job, marriage duration, place of living and children number, in addition, the anxiety of the patients and their spouses were evaluated in both groups in this stage.

The patients and their spouses (as couples) in the intervention group received three continuous teaching sessions lasting 40 to 60 minutes based on teaching content before chemotherapy. The researcher himself/ herself presented the first teaching session, but the second and third sessions were held with the assistance of a clinical psychologist due to the predicted contents of the teaching items. Teaching contents included reviewing cancer, getting familiar with its special treatments like chemotherapy or radiotherapy, the importance of the methods for increasing patients' treatment tendency, manipulating cancer complications, emphasizing the patients' compatibility to cancer and ways to relieve anxiety like mindfulness, progressive muscle relaxation technique, meditation, breathing techniques and positive self-talk. After teaching the manipulation of marital

conflicts in the third session, teaching contents (teaching booklets) were given to the patients and their spouses. Having considered the treatment plan and ' 'patient's availability, the treatment execution took three months, in which the researcher made sure to execute the teaching contents well, the researcher also responded to the 'patients' questions and finally ran the post-test in the intervention group. The control group received the ward routine teaching and had the post-test again according to the predicted timing. Teaching contents were given to the patients and their spouses in the control group regarding moral values.

Having gathered and encoded the data, they were analyzed using SPSS version 27 software. At first, descriptive statistics determined the frequency, percent, and mean, SD, the minimum and the maximum. Then the paired T-test compared the pre-test and post-test means in both groups. The independent T-test compared the means of the intervention and the control groups. X^2 test compared the frequency of the qualitative variables in both groups. The significance level was set as p value as < 0.05.

Results

Demographic information

Demographic information of the patients and their spouses in the control and intervention groups is presented in Table 1. Indicates the demographic information of the patients and their spouses ($p>0.05$).

'Patients' state anxiety before and after the couple teaching

Results of this study have shown that the mean and SD of the patients' state anxiety score have decreased from 49.97+-7.09 to 38.72 +-3.50 in the intervention group and they increased from 50.27+-6.64 to 50.42+-6.18 in the control group. Independent T-test has shown that there is a significant difference between the two groups considering the mean and SD of the patients' state anxiety score after the couples teaching intervention ($p<0.001$). More information is explained in Table 2.

Anxiety score of the spouses of the patients with breast cancer before and after the couple teaching

Anxiety score of the spouses of the patients with breast

cancer before and after the couples teaching intervention in the intervention group and the control group. Results of this study have shown that the mean and the SD of the state anxiety score of the patients' spouses have decreased from 52.7+-6.67 to 39.55+-2.89 in the intervention group and they have increased from 50.70+-4.94 to 51.35 +- 4.91 in the control group. The independent T-test has shown that there is a significant difference between the two groups regarding the mean and the SD of the patients' spouses' state anxiety score after the teaching intervention ($p<0.001$). More information is provided in Table 3.

Table 1. Demographic Information of the Patients and Their Spouses in the Control Group and the Intervention Group

Variable	Intervention group	Control group	P Value
	N (%)	N (%)	0.43
Patients job			
Housewife	32 (80)	29 (72.5)	
Clerk	8 (20)	11 (27.5)	
Spouses job			0.32
Clerk	18 (45)	17 (42.5)	
Self-employed	22 (55)	23 (57.5)	
Patients' education			0.96
Primary school	13 (32.5)	12 (30)	
Highschool diploma	13 (32.5)	13 (32.5)	
University education	14 (35)	15 (37.5)	
Spouse education			0.2
Primary school	9 (22.5)	4 (10)	
Highschool diploma	12 (30)	18 (45)	
University education	19 (47.5)	18 (45)	
Living place			0.28
City	28 (82.5)	33 (72.5)	
Village	11 (17.5)	7 (27.5)	
	Mean±SD	Mean±SD	
Patients age	38.85±10.56	39.27 ±10.18	0.85
Spouse age	41.97±10.34	43.02±10.13	0.64
Marriage duration	18.85±11.17	19.65±10.92	0.74
Children numbers	3.12±1.89	3.63±1.87	0.59

a, numbers are stated as mean ±SD or percent; b, the x^2 test; c, independent T-test

Table 2. The Comparison of the Mean and SD of the Patients' State Anxiety before and after the Couples Teaching Intervention in the Control and the Intervention Group

Time/ Group	Before of intervention Mean±SD	After of intervention Mean±SD	Variations Mean±SD	T-paired
intervention	49.74 ±7.09	38.70± 3.50	-11.27± 6.54	t= 10.89 df=39 p<0.001
Control	50.27 ± 6.64	5.42 ± 6.18	0.15 ± 1.47	T=-0.64 df=39 P=0.52
t-independent	t= -0.19 df=7 8 P= 0.84	t= -10.43 df=78 p<0.001	T= -10.76 df=78 p<0.001	

Table 3. The Comparison of the Mean and SD of the State Anxiety Score of the Spouses of the Patients with Breast Cancer before and after the Couples Teaching Intervention in the Intervention Group and the Control Group.

Time/ Group	Before of intervention Mean±SD	After of intervention Mean±SD	Variations Mean±SD	T-paired
Intervention	52.72 ± 6.67	39.55 ± 2.89	-13.17 ± 7.05	t=11.80 df=39 p<0.001
Control	50.70 ± 4.94	51.35 ± 4.91	0.65 ± 2.4	t=-1.71 df=39 P= 0.09
t-independent	t=1.54 df=7 8 P= 0.12	t= -13.07 df=78 p<0.001	t= -11.72 df=78 p<0.001	

Table 4. Results of the Covariance Analysis Related to State Anxiety Score of the Ppatients with the Bbreast Cancer Receiving Chemotherapy after the Couples Teaching Intervention with Controlling pre-test Effect.

Source of changes	Sum of squares	Degree of freedom	Mean of squares	F	Significance level	Effect size	Test power
Pre-test	937.17	1	937.17	75.69	<0.001	0.52	1
Group	2589.68	1	2589.68	209.15	<0.001	0.76	1
Error rate	891.46	72	12.38				
Total	163585	80					

Covariance analysis test of patients

There were the required conditions to apply the covariance analysis test according to the Lewene test results which included the hypothesis of approximate normality and homogeneity of variances and the hypothesis of regression homogeneity meaning the lack of significance between the interaction of the dependent and the concomitant variable (p=0.23). results of the covariance analysis test to moderate the significance of the pre-test scores showed that there is a significant difference between the mean of the patients' state anxiety score between the two groups after the couples teaching interventions (p<0.001) which means that executing couples teaching intervention in the intervention group can lower the mean of the patients' state anxiety score. More information is provided in the Table 4.

Covariance analysis test of Spouses

According to Levene's test results, there were the required conditions to apply the covariance analysis test, which included the hypothesis of approximate normality and homogeneity of variances and the hypothesis of regression.

Homogeneity meaning the lack of significance between the interaction of the independent and the concomitant variable (p=0.91).results of the covariance analysis test to moderate the significance of the pre-test scores showed that there is a significant statistical difference between the mean of the spouses state anxiety score of patients between the two groups after the couples teaching interventions (p<0.001) which means that executing couples teaching intervention in the intervention group can lower the mean of the patients' spouses state anxiety score. More information is provided in Table 5.

Discussion

Results of this study showed that this research hypothesis (the anxiety of the patients with breast cancer and their spouses is different between the intervention group and the control group) is confirmed. The obtained results of the anxiety of the patients and their spouses have indicated a significant difference in this variable score in the post-test between the intervention and the control group. In other words, anxiety level of those patients and their spouses who received the teaching intervention was decreased that indicates the efficacy of teaching the patients along with their 'spouses' participation.

Anxiety has been diagnosed as the most important disorder in patients with breast cancer and their spouses

Table 5. Results of the COA Related to the State Anxiety of the Spouses of Patients with Breasts Cancer Receiving Chemotherapy after the Couple's Teaching Intervention

Source of changes	Sum of the squares	Degree of freedom	Mean of squares	F	Significance level	Effect size	Test power
Pre-test	212.43	1	212.43	16.28	<0.001	0.23	1
group	2658.33	1	2685.33	205.9	<0.001	0.75	1
Error rate	939.01	72	13.04				
Total	169312	80					

among all the psychological disorders of patients with breast cancer [16, 26]. 'Patients' anxiety has a direct relationship with their spouse's anxiety [27] in addition in some cases, even their spouses have more anxiety than the patients [12]. This makes their spouses encounter many psychological, emotional and cognitive problems while caregiving if healthcare professionals do not help them thus having couples training intervention in the ward creates interaction and communication between the couples and the healthcare professionals, it also makes the couples be more determined to understand the cancer as a tolerable procedure. Finally, it improves the mechanisms to fight against anxiety and promotes couples' relationships.

More than half of caregivers of patients with cancer stated severe anxiety in the study by Cert et al. [28]. The study by Park et al. [29] showed that 38.1 % of the spouses of patients with cancer suffer from anxiety [29] Which is due to various reasons such as gloomy prognosis, more responsibilities or roles, unresponsiveness to treatment and dissatisfaction with caregiving [20,33]. The most common reason of anxiety for the spouses of the patients with breast cancer was related to the concern about the treatment procedures and its complications because if healthcare professionals do not intervene, this concern leads to physiologic and psychological symptoms among the patients' spouses. Holland et al [19] have investigated the anxiety of the patients and their spouses during various cancer stages. They stated that there was a difference of anxiety causes between patients with breast cancer and their spouses. This comparison showed that changing the mental image of women with breast cancer due to hair loss and surgery scar is one of the most stressful factors for them while the treatment procedure is stressful for their spouses. In fact losing attractiveness is the most stressful factor for women with breast cancer while their spouses cared more about their wives health condition [19].

The study of Lewis et al was similar to the current study which showed that teaching the spouses of women with breast cancer can moderates psychological indices especially decreasing the anxiety [30] they emphasized mostly on teaching (informational support) while the current study according to the intervention content during the sessions used anxiety management methods such as muscle relaxation, creative mental imaging, mindfulness practice and breathing techniques to considerably reduce spouses anxiety by the patients following the treatment. Having gathered these interventions in the current study made it more effective on patients' spouses' anxiety. Using this method is an effective way to reduce the anxiety of the spouses of the patients with the breast cancer.

Most of the previous studies have been family-centered, despite the great importance of the 'patient's spouse's participation in treatment procedures or they have only focused on the main caregivers while experiencing breast cancer has a complicated nature and patients' spouses are expected to be affected by this condition more than the others. In other words, the anxiety emanating from the diagnosis of breast cancer, the cancer burden and the long-term treatment make the patients' spouses nervous. Since cancer patients' caregivers are called the "hidden

patients" so others should pay more attention to them. During the teaching sessions, the researcher of the current study provided an opportunity for the patients to state the effect of the cancer-imposed conditions on their lives. Interventional training in the current study reduced the anxiety of the patients and their spouses. These interventions eased this stage of life for the couples. The study of Beirami et al (2013) results showed that couples training course is effective in reducing psychological disorders, especially anxiety [31]. In the study of Beirami et al (2013), only those couples that had higher education received the training and the training in the groups was limited to the information exchange which is different from the current study. Both of the studies emphasized training requiring the presence of spouses of patients with breast cancer. Rafiee et al. [25] along with the current study showed that couples training significantly reduced the anxiety of the spouses of the patients with acute coronary syndrome in the intervention group compared to the control group.

The result of study of Wong et al (2016) was different from the current study. They analyzed twelve articles related to couple-centred interventions in patients with cancer [32]. Generally, they concluded that couple-centered interventions lower couples' psychological reactions but the results of some of the other studies were not effective on the couple's anxiety. This meta-analysis study showed that those studies that just promoted a couple's skills using skills training intervention did not significantly reduce the anxiety of the spouses of patients with cancer. The researcher stated that training methods or type are the reasons for the ineffectiveness of some of the other studies so psycho-educational interventions were more effective in reducing the couples' psychological disorders than the skills training interventions. If many methods are combined for couples training, the intervention effectiveness will improve and it can be one of the reasons for the intervention effectiveness in the current study.

It is expected that in the control group (not receiving any intervention) the anxiety of the spouses reduces to some extent because it is said that in most cases psychological reactions of the patients and their caregivers are relieved after the cancer diagnosis and the treatment begins [33, 34]. The current study showed unexpectedly that there was no anxiety change for patients' spouses while anxiety reduction was observed in the intervention group due to the intervention effect therefore patients' spouses need special attention due to this finding.

In conclusion, results of the current study showed that both patients with breast cancer and their spouses suffer from considerable anxiety so providing a multidimensional supportive care intervention is effective in anxiety reduction. The total results of this study showed that couples training intervention for patients with breast cancer decreases their anxiety and promotes their mental health. It also makes the patient's spouses support patients with breast cancer more actively. Therefore in order to reach the desired treatment results it is recommended to consider these interventions for patients and their families (their spouses), especially during chemotherapy and

radiotherapy sessions. Patient's spouses participated in this study. The upcoming studies must investigate those spouses who avoided supporting the patients in order to make them participate in the next researches.

Limitations

The lack of a special accurate scale to evaluate the anxiety of patients with breast cancer and their spouses is one of the shortcomings of this current study and its similar ones.

The current study is of great importance because it has investigated the physical and psychological aspects of patients with breast cancer and their spouses by using an interventional strategy but the study limitation to chemotherapy sessions, radiotherapy sessions and lack of long-term evaluation (sic months or annual) are the limitations of the current study that the next studies should pay attention to them.

Author Contribution Statement

All authors contributed equally in this study.

Acknowledgements

Availability of data

The data will be available from the corrospinding author based on the request.

Conflict of interest

The authors declare that there is no conflict of interest regarding the publication of this paper.

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