Since 2002

Effect of Relaxation Training Techniques on Anxiety and Depression among Breast Cancer Patients

Mosleh Kareem[1]*, Diyar Hussein Taher[2]

[1]Department of Psychiatry and Mental Health Nursing, College of Nursing, Hawler Medical University, Erbil, Iraq; [2]Department of Psychiatry, College of Medicine, Hawler Medical University, Erbil, Iraq

Abstract

BACKGROUND: Non-pharmacological treatment for depression and anxiety includes a variety of treatments, such as various types of psychotherapy, education, and supporting measures. Behavioral treatments such as progressive muscle relaxation (PMR) and abdominal breathing exercises have been shown to be effective in the treatment of anxiety and depression in cancer patients.

AIM: This study aimed to evaluate the effect of PMR and abdominal breathing exercise techniques on anxiety and depression among breast cancer (BC) patients in Erbil City- Iraq.

METHODS: A quasi-experimental study was conducted at Rizgary Teaching Hospital-department of oncology and Nanakali Oncology Hospital at Erbil city-Iraq. Patients from both hospitals were selected as the intervention and control group, respectively. Patients were assessed through; the demographic data questionnaire, hospital anxiety and depression scale.

RESULTS: A total of 88 patients 44 from the control group and 44 patients from the intervention group participated. At the end of the study, there were significant improvements in anxiety and depression symptoms (p = 0.001) result was observed in both post-tests at 4-week and at 8-week.

CONCLUSION: The women who practiced PMR and abdominal breathing exercise techniques had lower anxiety and depression levels than those who only received routine nursing care, according to the findings. Oncology nurses should instruct BC patients to practice PMR and abdominal breathing exercise techniques to reduce their anxiety and depression.

Introduction

Breast cancer (BC) is the most frequent cancer among women worldwide, affecting 2.1 million women annually and causing the highest number of cancer-related deaths among females. One in four of all newly diagnosed cases of cancer in women is BC (24.2% of all female cancers) [1]. BC is the most common cancer and the leading cause of cancer death for women which accounts for 23% of all female cancers globally. The global cancer burden is estimated to have risen to 18.1 million new cases and 9.6 million deaths in 2018 [2]. BC is the most commonly diagnosed cancer globally and continues to be second only to lung cancer as the cause of cancer death. The American Cancer Society estimates that 284,000 Americans will be diagnosed with BC and 44.130 will die of the disease in the United States in 2021 [3]. BC is one of the significant prevalent malignancies among Iraqi women, which ranked as the number one cancer documented in all provinces [4].

BC remains the furthermost diagnosed cancer among women worldwide. In the Arab world, BC represents 14–42% of all female cancers. BC and its subsequent treatment are a great source of anxiety and depression in patients [5]. Although high state anxiety and depressive symptoms are important problems in women during and after the diagnostic process for breast disease, in many women [6]. BC is one of the most feared diseases among women and it could induce the development of psychological disorders such as anxiety and depression. The prevalence of anxiety was 31.7% and depression was 22.0% among the BC patients [7]. Patients with BC are more likely to experience severe anxiety, depression, and other mood disorders, and psychological distress is common among them [8]. BC patients are high, and they are at higher risk of developing major psychiatric comorbidities. Depression and anxiety are the most common disorders that can be present in BC patients through their illness from diagnosis to the end of the disease [9]. According to Batrawi *et al*., (2017), the prevalence of anxiety was 70% and depression was 63.3% among Egyptian female BC survivors [10]. High levels of anxiety and depression are common in BC patients, hence lowering their quality of life [11].

Depression and anxiety not only affect the quality of life but also compromise compliance with anticancer treatment are associated with prolonged hospitalization, and may have negative effect on

prognosis and even survival [12]. BC is the most common malignancy in women worldwide. The diagnosis and treatment for BC in women were well known in leading to significant psychological distress. The prevalence of psychological distress in cancer patients is reported to be above 30%. Although, BC patients experienced a high level of distress which includes depression and anxiety after diagnosis [13]. A study done in Erbil city revealed that increased levels of anxiety and depression after a diagnosis of BC highlight the need for dedicated psychiatric service provision. Psychological interventions for women with BC should involve an account of the broader social context in which cancer occurs, with a focus on improving social support [14].

The progressive muscle relaxation (PMR) technique is an effective relaxation therapy to reduce anxiety and depression among hospitalized patients. This relaxation therapy is easy to learn and practice and does not require trained professional or any supplies to facilitate the training [15]. PMR was effective in alleviating anxiety and depression in cancer patients undergoing chemotherapy. Therefore, PMR can be usefully utilized as a nursing intervention that enhances the psychological function of cancer patients [16]. Patients with depression, anxiety, and stress levels decreased after participating in a relaxation training program and a psychoeducational program [17]. Post-operative BC patients might manage anxiety and other side effects using relaxation techniques during chemotherapy [18]. Patients with prostate and BC who are receiving chemotherapy can benefit from PMR and guided imagery sessions [19]. The study done by Kashani _et al_., in 2012, suggested that muscle relaxation technique was improve the psychological status of patients with BC. This technique can be used as a simple and applicable complementary method in all health centers and even at homes of patients who suffer from depression, anxiety, and stress [20]. Non-pharmacological treatment for depression or anxiety involves several approaches, one of them is PMR and deep breathing exercises, have been successfully practice in the treatment of depression and anxiety disorders among cancer patients [21].

Importance of the study

PMR is a nursing intervention from the nursing interventions classification defined as facilitating the tensing and releasing of successive muscle groups while attending to the resulting differences in sensation. Deep breathing exercises, and gradually relaxing the muscles from the head to the feet. Through this repetitive practice, the patient is able to quickly memorize how to recognize and distinguish the associated feelings of a tensed muscle and a completely relaxed muscle. The accomplishment of physical relaxation promotes mental calmness in a parallel manner. PMR has also been practiced in cancer care and has been established effective among others in pain, fatigue, nausea and vomiting, and anxiety [22].

In addition, up to the best of our knowledge, there were no studies done in the Kurdistan region-Iraq like this, on the other hand, we published an article entitled; Assessment of Depression Severity among Cancer Patients in Nanakali Hospital/Erbil City-Iraq, revealed that 79% of them had depressive symptoms [23]. These results let us think about techniques to reduce the psychological distress among BC patients such as PMR and abdominal breathing exercises, which indeed, revealed positive effects in reducing symptoms of depression and anxiety.

Actually, depression and anxiety are common psychological distress in BC patients, so through the practicing relaxation techniques as deep breathing exercises and PMR technique may help in reducing depression and anxiety symptoms. The role of nurses is to instruct the patients about relaxation techniques and meet the complex physical and psychosocial needs of patients with cancer and their families, using empathy, knowledge and experience to assess and alleviate the psychosocial suffering of BC patients. Hence, the present study tries to clarify the effect of relaxation techniques for BC patients proposed that, it might have positive effects in reducing symptoms of depression and anxiety.

Methods

Study design and setting

Ethical consideration was the main principle in data collection. A written consent was received from patients before starting interview by signing the informed consent prepared by researcher. Patients from both hospitals were selected as the intervention and control groups in a quantitative quasi-experimental study done at Rizgary Teaching Hospital- department of oncology and Nanakali Oncology Hospital in Erbil, Iraq.

Regarding inclusion criteria; who were 18–55 years old, female BC and exclusion criteria; male, patients with psychiatric diagnoses, other than BC or metastases, and patients without informed consent. After an initial interview with 110 patients, 70 Cases from Nanakali Oncology Hospital and 40 Cases from Rizgary Teaching Hospital- Department of Oncology. 22 women were found to be not eligible for the study, due to not applied the inclusion criteria such as elderly, metastasis, duration of BC more than 2 years, patients with psychiatry and mental illness and faced to COVID-19 pandemic, hence the exact remained cases were 88 cases to be successfully recruited. Eighty-eight patients from total of 110 cases were accepted to participated in the study. They were divided into

two groups, one group of (44) patients exposed to the relaxation technique sessions (intervention group) and another group of (44) participants were not exposed to the relaxation technique sessions and considered as (control group), as shown in Figure 1.

Study hypothesis

The severity of anxiety and depression symptoms among BC patients who participate in abdominal breathing exercise techniques and PMR intervention program will decrease after program. The levels of anxiety and depression symptoms among BC patients who participate in abdominal breathing exercise techniques and PMR intervention program will decrease when compared to those of the controls group.

Instruments

Through the review of related literatures, the investigator applied the standard questionnaire format, the questionnaire was used for data collection, it was forward and backward translated to the Kurdish language by linguistic specialists, it is required 25–30 min to answer all questions, and it was comprised three major parts.

Part I: Socio-demographic information patients

Such as: Age, level of education, marital status, occupation, economic status, and residential area.

Part II: Socioeconomic status data (SES)

It was depending on patient's age, level of education, patient's occupation, also Husband's occupation, Car, House.

The SES calculation was: SES = Education + Occupation + House ownership * 0.5 + Car ownership * 0.1 + (age-20)/100 – Retired/unemployed/Deceased. The minimum score would be 0 for an unemployed, illiterate,
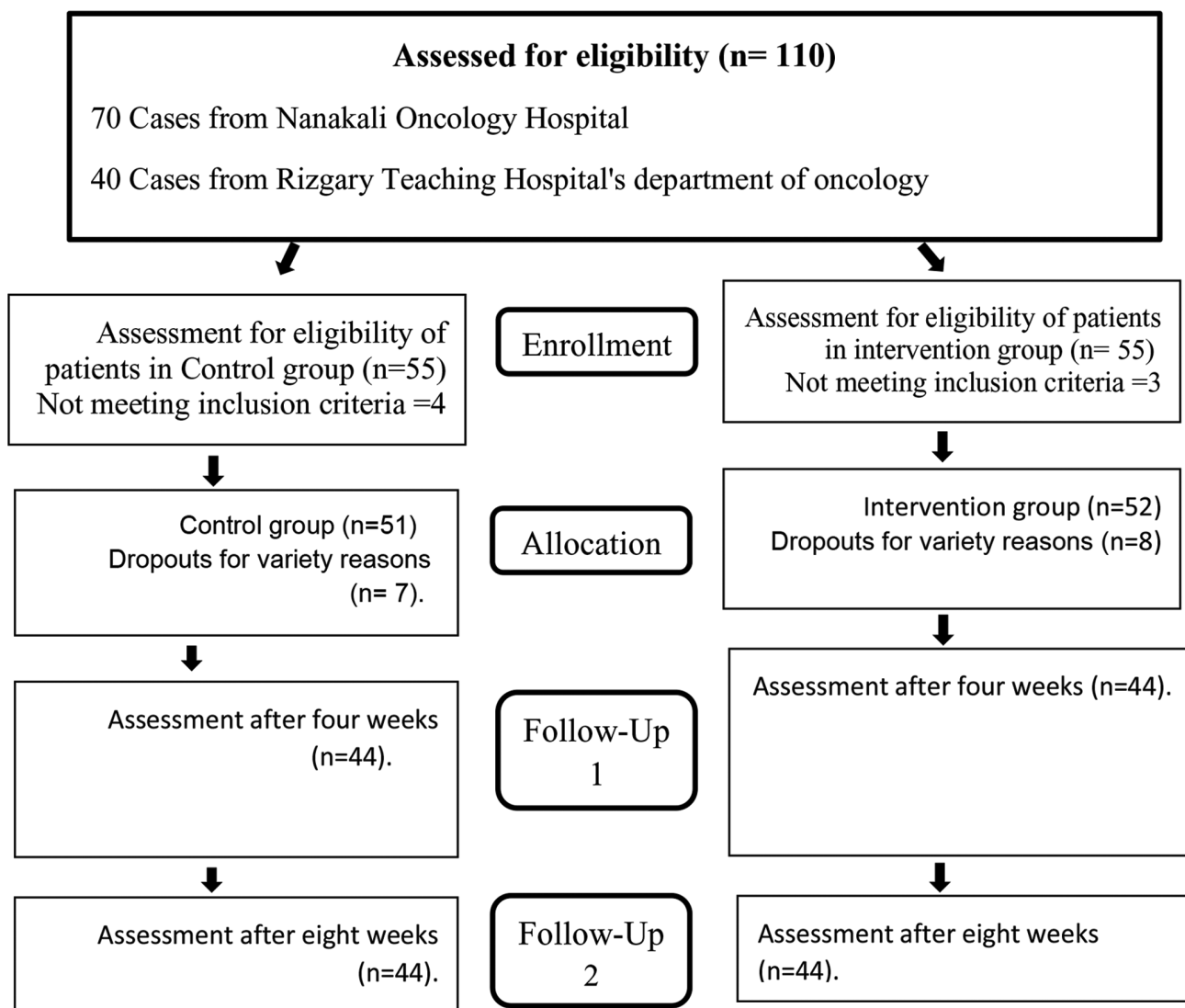

Figure 1: Flow diagram of study and control group of breast cancer

young manual laborer with no house and car, and the maximum 14.05 for a medical doctor of 65 years (which is the usual age of retirement in Iraq) who has a car and a house. The calculated SES score can either be divided into equal parts (9.38–4.05 = high, 4.69–9.37 = middle and 0–4.68 = low socioeconomic levels [24].

Part III: The hospital anxiety and depression scale (HADS)

Is a well-established screening instrument for depression and anxiety in patients with cancer. Because the HADS was developed for use in medically ill patients, it does not depend on somatic symptoms of depression and anxiety such as pain and weight loss; instead, it focuses on cognitive symptoms of anxiety and depression [20]. The HADS has been extensively used in study populations in oncology research, and it is a reliable screening measure in this sensitive patient population. It is a 14-item self-reporting instrument, two subscales of seven items each, namely, HADS-Depression and HADS anxiety, each of which uses a 4-point scale (0: no problems to 3: maximum distress). Thus, scores on each subscale range from 0 to 21. High scores indicate relatively severe symptoms; the severity of symptoms is interpreted as normal (0–7), borderline abnormal (borderline case) (8–10), abnormal anxiety (case) (11–14), and high [25].

Procedures

The questionnaire, the HADS were applied to the intervention and control groups at the initial interview; was applied again to the both groups 4 and 8 weeks after the intervention group completed the program, an abdominal breathing and PMR techniques was conducted on the intervention group, developed based on two sessions, each session run as an individually therapy and lasted for 1 h twice per week. Note the level of tension you are feeling, then place one hand on your abdomen right beneath your rib cage, Inhale slowly and deeply through your nose into the "bottom" of your lungs, when you have taken in a full breath, pause for a moment and then exhale slowly through your mouth, depending on your preference, do ten slow, full abdominal breaths, try to keep your breathing smooth and regular, without gulping in a big breath or letting your breath out all at once. It will help to slow down you are breathing if you slowly count to four on the inhale (1-2-3-4) and then slowly count to four on the exhale. Remember to pause briefly at the end of each inhalation. Count from ten down to one counting backward one number with each exhalation. The process should go like this: Slow inhale … Pause … Slow exhale ("Ten.") Slow inhale … Pause … Slow exhale ("Nine.") Slow inhale…

Pause … Slow exhale ("Eight.") and so on down to one, keep up the exercise for at least three to 5 min, practice the Abdominal Breathing Exercise for 5 min every day for at least 8 weeks [26]. Learnt patients about definition, benefits and uses of abdominal breath exercise and PMR technique, identification of the target muscles and muscle groups; In Jacobson technique, the body muscles were divided into sixteen different muscle groups of the body during performing the technique, an active muscle contraction for 5 s and then release of the same muscles for 10 s. The order of muscle contraction and release is as following: right and left hands, arms, facial muscles, neck and shoulders, right hand, left hand, stomach and back, chest and the shoulders, chest, stomach, back, thighs and buttocks, and lower legs [27].

However, patients were encouraged, monitor, and assisted to practice the relaxation therapy on their own daily life over the 2-month period on abdominal breathing exercise and PMR techniques as scripts and videos which were handed through pamphlets and CD, or sent through a group chat of Viber that had already been created by the researcher, they all downloaded on their cell phones. The control group was not given any intervention. Finally, the depression and anxiety levels were assessed through HADS questionnaire, both intervention and control groups were required to complete the HADS questionnaire at 4 weeks (post-test 1) and 8 weeks (post-test 2).

Data analysis

To analysis the results of the study data were entered in to SPSS (version 23) analyzed based on the objectives of the study such as frequency, paired t test sample, and independent t-test sample.

Results

Reveal that 44 of the female BC s were in control group and other 44 of the patients were in intervention group. Concerning participants age about 47.7% of the women were in control group; however, 63.3% of patients in intervention group belonged the age group, 36–45 years old. Furthermore, it shows 27.3% were graduated from Primary school from both groups (intervention and control group) in, respectively, regarding the jobs of participants majority 77.3% of them was Unskilled manual occupations (Housewives) in control group meanwhile, 75% of them also was (Housewives) among intervention group. About 79.5% were married in control group whereas 88.6% of intervention group were married. Most (63.6%) of the studied sample were in low socioeconomically class in control group however 54.5% in intervention group were in low socioeconomic class. The more than half of participants 61.4% in control group and 59.1% lived in

urban areas, respectively. There was no any significant difference between sociodemographic characteristics of study sample in intervention and control group (p ≥ 0.05) (Table 1).

Table 1: Socio-demographic characteristics of patients

Items	Control group (n = 44)		Intervention group (n = 44)		p-value
	No.	%	No	%	
Age group/Years					
26–35	15	34.1	6	13.3	
36–45	21	47.7	28	63.3	
46–55	8	18.2	10	22.4	
Mean and Standard deviation	39.59 ± 7.15		42.81 ± 6.38		
Educational levels					
Primary school	12	27.3	12	27.3	0.857
Intermediate school	11	25	11	25	
High school	10	22.7	7	16	
Diploma	1	2.3	2	4.5	
Bachelor degree	3	6.8	6	13.6	
Master degree	7	15.9	6	13.6	
Occupational categories					
Unskilled manual occupations	34	77.3	33	75	0.891
Skilled manual and non-manual occupations	3	6.8	2	4.5	
Associate professional occupations	6	13.6	7	16	
Skilled professional or senior managerial occupations	1	2.3	2	4.5	
Marital Status					
Married	35	79.5	39	88.6	0.891
Single	2	4.5	4	9.1	
Divorced	7	16	1	2.3	
Socioeconomic status					
Low	28	63.6	24	54.5	0.63
Middle	11	25	15	34.1	
High	5	11.4	5	11.4	
Residency					
Urban	27	61.4	26	59.1	0.947
Suburban	12	27.3	12	27.3	
Rural	5	11.3	6	13.6	

There is no statistically significant difference between the intervention and control group regarding anxiety symptoms in pre-test while opposite (very high significant difference) result was observed in both post-tests at 4-week and at 8-week (Table 2).

Table 2: Comparative difference between the intervention and control groups with anxiety mean scores of the pre and post-tests

Anxiety	Control group	Intervention group	Independent samples test	95%Confidence interval of the difference	
	Mean ± SD	Mean ± SD	p-value	Lower	Upper
Pre-tests	9.79 ± 4.44	10.25 ± 4.28	0.627	−2.30	1.39
Posttest 1 (after 4 weeks)	9.63 ± 5.73	4.9 ± 3.45	0.001	2.71	6.73
Posttest 2 (after 8 weeks)	8.43 ± 6.64	2.65 ± 2.42	0.001	3.68	7.86

It indicates that there is no significant difference between the intervention and control group regarding depression symptoms in pre-test, while statistically high significant difference results between baseline and post-test one (after 4 weeks) and post-tests two (after 8 weeks) (Table 3).

Discussion

The study found that the mean and standard deviation age for control group was 39.59 ± 7.15 while in study group was 42.81 ± 6.38. This result was supported with the study results done by Yilmaz and Arslan (2015) [28]. Majority of the study sample was married,

Table 3: Comparative difference between the intervention and control groups with depression mean scores of the pre and post-tests

Depression	Control group	Intervention group	Independent samples test	95% confidence interval of the difference	
	Mean ± SD	Mean ± SD	p-value	Lower	Upper
Pre-tests	13.45 ± 3.92	12.36 ± 5.43	0.283	−917	3.09
Post-test 1 (after 4 weeks)	13.22 ± 3.88	7.2 ± 4.44	0.001	4.25	7.79
Post-test 2 (after 8 weeks)	12.52 ± 4.62	4.72 ± 3.79	0.001	6.0	9.58

the present result study was supported by the study done by Huang *et al*. (2019) and others [29], [30], [31], [32]. The findings of present study indicate that majority of the studied sample graduated for primary school, and from urban area, this result was agreed with the study results that conducted by Tsaras *et al*. [30]. The present study showed that majority of the studied sample was low SES, Housewives, this result was compatible with the results of a study conducted in Egypt, done by Alagizy *et al*. [31]. In this study, SES data were taken from BC patients to study the relation of economic status to anxiety and depression. The lower economic status and higher treatment expenses were directly associated with anxiety and depression percentage. In addition, extra expenses are required to purchase medications, because some time may not available in hospitals. At that time, Iraq faced many problems such as; the economic crisis, war, and COVID-19 pandemic.

In the present study shows that statistically significant effect of PMR and abdominal breath exercise techniques on reducing anxiety symptoms (p = 0.001) between intervention group when compared with control group (results between baseline and post-test one after 4 weeks and post-tests two after 8 weeks) among female BC patients. Similar results were found by Song *et al*. Relaxation training during chemotherapy can reduce anxiety and other adverse events in post-operative BC patients [18], [19]. However, relaxation therapy's success in reducing anxiety levels may be related to the activation of parasympathetic activity, which results in the lower blood pressure, heart rate, muscle tension, and breathing rate, as well as sensations of calm and control [33]. Therefore, the present study results revealed that anxiety and depression were statistically significantly decreased among the study group after the intervention program (p = 0.001). This result was concordance with the study done by Charalambous *et al.* in 2015, the findings showed that patients with prostate and BC undergoing chemotherapy treatment can benefit from PMR and guide imaginary sessions to reduce their anxiety and depression [18]. Based on the present study results indicates that there is no significant difference between the study and control group regarding anxiety and depression symptoms in pre-test study, while statistically high significant difference in corresponding mean scores between pretest and posttest after 4 weeks for both groups, meanwhile, the present study strongly agree with the study done by Kashani *et al*., reported that anxiety

and depression among breast cancer patients in both group (control and intervention), there were no significant differences between the two groups before interventions. However, after 4 weeks of relaxation techniques, significant differences were observed in corresponding mean scores between the control and intervention groups. Thus, relaxation technique can be thought to be effective in reducing depression, anxiety, and stress [20].

Furthermore, when the mean scores of anxiety symptoms in the control group were observed without any allocation concealment or intervention, they self-decreased after 8 weeks from 9.795 to 6.75. Our explanation for these results was related to time period, religion. The participants were deeply observed by the researcher regarding religion principles, such as majority of them did prey, reading, and listening Holy Quran, sermon. These Behaviors increased after mastectomy and especially during chemotherapy. Moreover, the study which was done by Ng *et al*., (2017) supported the present study. conducted a study with patients who were diagnosed with BC, revealed that After being diagnosed with BC, individuals often experience a high level of discomfort, including depression and anxiety. The level of distress decreased over time [13]. In addition, the study done by Stewart *et al*., 2019 showed that there is strongly supported the present study results, which is entitled review of the effect of religion on anxiety showed that there were 32 studies included, this review showed, in almost every study, that religion in general, religious training, spirituality, faith, prayer, religious community and worship were associated with reduced anxiety. These effects were observed in both healthy individuals and various patient populations. In addition, many studies demonstrated that religious-based treatment intervention was helpful in the treatment of anxiety [34].

Strengths points of the study

1. On our knowledge this is the first study done in Kurdistan region of Iraq
2. As a general, the patients got benefit from relaxation techniques and felt psychological well-being.

Research limitations

In this study, some caregivers did not allow me to talk to their patients, because the oncologist and family did not inform the patients about their diagnosis of BC, so the researcher excluded them from the sample study. Applying individual therapy had to replace group therapy, which needed more time than usual, due to the spread of the COVID-19 pandemic at that time. However, an initial number of interviewed participants were excluded due to limitations imposed to combat the COVID-19 pandemic. Quality of life was not assessed in our survey, which is a major issue in a reported psychological disorder. Few numbers of the women were uneducated and did not believe the in psychology as a science, so refused at the beginning of the interview.

Implication

The results of this study can be used as a reference for evaluating and knowing the incidence of anxiety and depression in BC patients, it can be used as a consideration for hospitals to make anxiety and depression screening programs in BC patients, so as to detect the incidence of anxiety and depression in BC patients. More attention should be paid to BC patients who are experiencing psychological distress. Given the high prevalence of psychosocial stress and its side effects on cancer recurrence and death, it is recommended to carry out routine screening and early detection. Because depression and anxiety can change across the cancer treatment trajectory, regular screening can help effectively monitor psychological changes in the early period and allow for timely psychological interventions such as abdominal breathing exercise and PMR techniques is it very useful to reducing anxiety and depression symptoms among patients with BC and to prevent them from getting worse.

Conclusion

The women who received PMR and abdominal breath exercise techniques had lower anxiety and depression levels than those who only received normal nursing care, according to the findings. Oncology nurses should educate patients with BC to use the PMR technique to reduce their anxiety and depression. Psycho-education programs need to be directed among patients that will reduce anxiety and depression in considerably, but the best solution, is present the psychiatric nurse or clinical psychologist much necessary in oncology hospitals.

Declarations

Ethics approval and informed consent to participate

The research reported in the manuscript complies with APA ethical standards in the treatment of human participants. The Medical Ethics Committee of the college of Nursing at Hawler Medical University, where this study was conducted, approved the study and

informed consent procedures. (Approval number: 89). All procedures followed were in accordance with the ethical standards of the responsible committee on human experimentation (institutional and national) and with the Helsinki Declaration of 1975 (in its most recently amended version). The research participants were provided written and verbal explanations of the study's purpose and were asked to submit a written informed consent form that guaranteed to them that their cooperation in the study would be voluntary, and that they could refuse to participate at any time during or after the study. Finally, to confirm that all methods were carried out in accordance with relevant guidelines and regulations.

Availability of data and materials

The datasets and interview transcripts used and/or analyzed during this study are available from the corresponding author on reasonable request.

Authors' contributions

MSK: Conception of the research, study design, literature review, data analysis, interpretation, and drafting of the manuscript; DHT: Quality assessment and reviewed the manuscript. All authors have read and approved the manuscript.

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Authors' information

Mosleh Saber Kareem; MSc. in Psychiatric-Mental Health Nursing, University Lecturer at Hawler Medical University, Psychotherapist in Jiyan Foundation for Human Rights, also Lecturer in International Tishk University, Researcher, and Ph.D. student. Diyar Hussein Taher; Assist. Professor in psychiatry, MBCHB-FICMS (Psych).

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