https://menj.journals.ekb.eg
Print ISSN: 2735-3974
Online ISSN: 2735-3982
DOI: 10.21608/menj.2025.450999

MNJ
Menoufia Nursing Journal
Faculty of Nursing
Menoufia University

Effect of Nursing Intervention on Selected Clinical Outcomes among Patients with Breast Cancer undergoing Radiotherapy

Hanan Ragab Radwan[1], Wafaa H. Abdullah[2], Nasser Mohamed Abd EL-Bary[3], Samah E. Masry[4], Hanaa E. El-Sayad[5]

[1]Assist. Lecturer of Medical Surgical Nursing

[2,4]Prof. of Medical Surgical Nursing

[3]Prof. of Clinical Oncology and Nuclear Medicine, Faculty of Medicine, Menoufia University, Egypt,

[5]Assist.Prof. of Medical Surgical Nursing

[1,2, 4,5]Faculty of Nursing, Menoufia University, Egypt

Abstract: **Background**: breast cancer and its treatment modalities are associated with several complications the most common being pain and anxiety. Exercises, massage and health education are recommended as complementary therapy, along with clinical treatments to help alleviating these complications. **Purpose**: to examine the effect of nursing intervention on selected clinical outcomes among patients with breast cancer undergoing radiotherapy. **Design:** A quasi-experimental research design was utilized for this study. **Setting**: the study was conducted at the Oncology outpatient clinic of radiation therapy department at Menoufia University Hospital in Shibin El Koum, Egypt. **Sample**: A convenient sample of 100 patients who met the inclusion criteria was selected and divided into two equal groups (Study & Control). **Instruments**: three instruments were used for data collection: Structured interview questionnaire, Zung Self-Rating Anxiety Scale (SAS) and Visual Analogue Pain Scale (VAS). **Results**: the study results revealed a highly statistical significant decrease in the mean anxiety score was observed the study group at four weeks post intervention and follow up (47.54±9.67 and 29.44±5.51 respectively). Additionally, a highly statistical significant reduction in main pain scores among the study group at four weeks post intervention (6.1±1.3.Vs 9.1±1.08..) and follow up (2.44±0.73.Vs 8.5±1.49) as compared to control. **Conclusions**: nursing intervention had a significant effect on reducing anxiety and pain level among study group than control group. **Recommendations**: Encourage nursing staff at radiotherapy unit about the use of evidence based nursing intervention for breast cancer patients before starting their therapy and continue during and after completion of their therapy for reducing anxiety level.

Key words: *- Breast cancer, nursing intervention, radiotherapy, selected outcomes.*

Introduction

Breast Cancer (BC) is a worldwide vital issue, also the main cause of women's illnesses and deaths both in developed and developing nations. It ranks the highest 3rd leading cause of cancers and the highest 5th reason of mortality among females (American Cancer Society, 2023). The standard management therapy for BC includes surgery, chemotherapy; radiotherapy and immunotherapy are used alone or in combination to treat breast cancer, depending on the stage and type of tumor. These treatment modalities have resulted in significant improvements in overall survival and patient-reported outcomes (Mugundhan & Mohan, 2024). Radiation therapy has a significant role in local control of breast cancer, primarily in the adjuvant setting, but may also be used for palliative therapy (Ibraheim et al., 2024).

Radiotherapy in any of its modalities also has adverse effects. These effects appear on average in the third week of radiation treatment (Abreu et al., 2021). About 25% of patients suffered from persistent pain during breast cancer therapy. Persistent pain not only affects normal activities, but also aggravates the patient's psychological burden, reduces compliance for functional exercise, and prolongs recovery. Therefore, relieving pain is an important measure for early functional exercise and long-term adherence to treatment (Wang et al., 2020 & De Baets et al., 2024).

Throughout cancer treatment nearly half (48.9%) of the patients with BC experienced moderate-to- severe anxiety (Qiu et al., 2024). Therefore, management of breast cancer associated anxiety represents a great challenge for the nurse because psychological state has an impact on the patient's functional status and consequently the general activity level. So, these complications can be managed by using evidence based nursing intervention which is a new traditional nursing scheme for breast cancer patients (Linlin, 2021 & Zhai, 2020).

Breast cancer radiotherapy related psychological distress can be managed through a number of pharmacological and non-pharmacological nursing interventions. Massage therapy is one of non-pharmacological approaches featuring a safe, inexpensive and easy to use method that can be utilized by breast cancer patients without measurable side effects (Bahceli et al., 2022). Swedish massage technique is used to improve limb blood circulation and motor function and as a result of its relaxing nature which can be especially helpful in improving pain sensation and relieving anxiety (Goll and Aghamohamadi, 2020).

In addition functional exercise is a convenient, effective and economical evidence based nursing intervention for patients with breast cancer, as early progressive functional exercise is necessary to improve circulation in the affected limb and preventing complications (Qiu et al., 2024). So this study was carried out to examine the effect of nursing intervention on selected outcome (pain and anxiety)

among breast cancer patients undergoing radiotherapy.

Significance of study

Breast cancer patients suffer from anxiety and other psychological symptoms which are treated in only 40% of patients with breast cancer also pain is reported by 20-68 % of them (Lin et al, 2020). The existing routine nursing care is mostly disease-centered and ignores the actual needs of patients (Liu, 2020). Nursing staff play a vital role in giving guidance to patients upon their admission, and perform targeted nursing measures such as upper limb exercises, massage and psychological counseling, so as to improve the patient psychological condition (Li et al., 2021).

Purpose of the study

The purpose of the current study was to examine the effect of nursing intervention on selected outcomes among breast cancer patients undergoing radiotherapy.

Research Hypotheses

- Patients who receive the nursing intervention (study group) are expected to have fewer pain scores than patients who do not (control group).
- Patients who receive the nursing intervention (study group) are expected to have lower anxiety level than patients who do not (control group).

Operational definitions:

- **Nursing intervention** is operationally defined as a nursing intervention including the provision of health education about the disease process, treatment modalities, radio therapy and lts complications, swedish massage and rehabilitation exercises (e.g Isometric handgrip exercise, etc…..).
- **Selected Outcomes** are operationally defined as breast cancer patient complains associated with radiotherapy, which include pain and anxiety. It will be assessed using Zung Self-rating Anxiety Scale and Visual Analogue Pain Scale (instruments two and three).

Methods:

Research Design

A quasi-experimental research design (study and control) was utilized to achieve the purpose of the current study.

Setting

The current study was conducted at outpatient clinics of radiation therapy of Oncology department, Menoufia University Hospital, at Shebin El-Kom, Menoufia Governorate, Egypt.

Sampling

A convenient sample of 100 adult patients with breast cancer from the previously mentioned setting was selected. A simple random sampling technique was used to assign them into two equal groups (study and control). 50 patients for each group. They were selected according to the following criteria

Inclusion criteria:

Adult female patients diagnosed with breast cancer, after mastectomy (radical, modified radical, lumpectomy

and conservative), undergoing postoperative radiotherapy for the first time, may have chronic disease (hypertension, diabetes …) and able to communicate.

Exclusion criteria

- Patients having Lymphedema due to cancer recurrence because the results from this condition may interfere with complications of metastasis.
- Patients who are unable to cooperate due to mental illness, because they will not be able to understand the nature of intervention.
- Complicated cases with organ dysfunction because of patients' need for supportive and special health care.

Sample size was determined based on the following equation:

$n0 = Z^2 p q / e^2$

Z^2 = was the desired confidence level which is 95% (1.96) (The value for Z is found in statistical tables which contain the area under the normal curve)

e = was the desired level of precision 0.05 (±5%),

p = was the estimated proportion of an attribute that is present in the population, and q is 1-p.

As the sample included breast cancer patients with certain inclusion criteria, the sample size (n0) could be adjusted as:

$n = n0 / [1 + \{(n0 – 1) / N\}]$

Where (n) was the sample size and N was the population size. A simple random sampling technique was used to assign them into two equal groups (study and control). 50 patients for each group

Instruments of the study:

Three instruments were used for collecting the data in this study. These instruments were:

Instrument one: Structured interview questionnaire.

It was developed by the researchers to assess baseline personal and medical data. After reviewing the relevant literature (Douglass et al., 2016 and Dong-suk et al., 2021). It comprised of two parts as the following:

- **Part 1: Sociodemographic data**: It was comprised of seven questions about patient's age, gender, marital status, level of education, occupation, residence.
- **Part 2 : Medical data** : It was comprised of nine questions related to past and present medical history such as number of hospitalization after diagnosis, presence of chronic diseases, duration of suffering from the tumor, tumor location; tumor stage; type of surgery; additional treatment, radiotherapy device, number of radiotherapy sessions, weight, height and body mass index (BMI).

Instrument two: - Zung Self-rating Anxiety Scale (SAS):

The SAS was adopted from Ramirez and Lukenbill, (2008). It was used to assess anxiety level. A 20-item self-report assessment device covers four main categories: cognitive, autonomic, motor, and central nervous system symptoms. Each question is scored on

a Likert-type scale of 1-4 (a little of the time, some of the time, good part of the time and most of the time). Some questions were negatively worded to avoid the problem of set response.

Scoring system:

The total raw scores range from 20-80. Interpretation of the level of anxiety is as follows:

Interpretation of total scoring system:

Interpretation	Score
•No anxiety	20-44
•Mild to moderate anxiety	45-59
•Severe anxiety	60-74
•Extreme anxiety	75 and above

Instrument three: - Visual Analogue Pain Scale (VAS)

It was adopted from Bain et al., (2005), it was used to rate the level of pain intensity Pain measurement ranged from zero (no pain) to ten (extreme pain).

Interpretation of total scoring system:

Interpretation	Score
•No pain	0
•Mild pain	1-3
•Moderate pain	4-6
•Severe pain	7-9
•Extreme pain	10

Validity of the instruments: -

All instruments were tested for its validity by a jury of seven experts in the field of Medical Surgical Nursing specialties, faculty of nursing, Menoufia University to ascertain relevance, completeness, and clarity comprehensiveness, understanding, clarity and applicability. Modifications were done accordingly to ascertain relevance and completeness.

Reliability of the instruments: -

The first instrument was tested using a test- retest method to ascertain consistency. The period between both tests was two weeks. The results were 0.97 for the first instrument, and 0.80 for the second instrument (according to Ramirez and Lukenbill (2008). Cronbach's alpha was 0.78 and a split-half reliability was 0.75 . Boonstra et al., (2008) tested the reliability of the pain scale and found that the test-retest reliability was r= 0.84.

Pilot study:

A pilot study was conducted prior to data collection on 10% of the study sample (ten patients) to test the feasibility; clarity and applicability of the instruments and to identify the difficulties that would be faced by the researchers during the application. Necessary modifications were made. These patients were excluded from the study sample to avoid bias.

Ethical Considerations:

The researchers obtained approval to conduct the study from the Research Ethics Committee of the Faculty of Nursing, Menoufia University (approval number 856, date????). The participants in the study were provided with a verbal and written explanation of the study's purpose and asked to provide their consent to participate. Each participant was assured that their information would be kept confidential and used only for scientific research. The researchers made it clear that participation in the study was

voluntary, and patient's anonymity was guaranteed through data coding. Participants were informed that they could withdraw from the study at any time and their decision not to participate would not affect their care. They were also assured that the study would not cause any physical or emotional harm.

Procedure:

A written official letter was submitted from the Dean of the Faculty of Nursing, Menoufia University to the director of Oncology department hospital including the purpose of the study and methods of data collection

- The researchers collected the data from outpatient radiation clinics (unit). The researchers attended two days/ week (Sunday and Thursday) for the control and study groups until data was completed throughout a period extended over nine months from the beginning of December 2023 to the end of August 2024.
- The period of data collection started from the beginning of radiotherapy which lasted four weeks and continued to 12 weeks after finishing radiotherapy Total period of data collection was 16 weeks.
- Each patient who met the eligibility criteria and agreed to participate in the study was interviewed individually at the radiotherapy waiting area for about 30 to 40 minutes for each patient. In the first meeting with subjects lasted from 9 am to 4 pm in which subjects attended according to their scheduled time according to their residence.
- The researchers dealt with the control group firstly then the study group to avoid the contamination of results.
- The study was conducted throughout four phases: Assessment, planning, implementation, and evaluation phase as following:
  - ❖ Each patient of both groups was interviewed individually in the radiotherapy waiting area and assessed for patient's personal and medical data at the first day of radiotherapy using instrument I (Structured interview questionnaire). Each patient of both groups was assessed for their anxiety level using instrument two (Zung Self-rating Anxiety Scale and pain level using instrument three (VAS).
- A colored instructional booklet was prepared containing all information about (breast cancer, treatment modalities, side effect from radiotherapy and how to overcome rehabilitation exercises and swedish massage) to meet patients' needs in order to improve the level of pain and anxiety. For study group a special rehabilitation exercises and massage was used to deal with patients' psychological problems based on the guidance of the previously listed literatures.
- The intervention was performed for patients by the researchers throughout three sessions extended for (30-40) minutes for each during the patients' visit to the oncology unit for the purpose of treatment and follow-up at the waiting area of radiotherapy for the study group. Small group discussions (2-4

patients) were used to provide educational information and training practices about rehabilitation exercises by using (demonstration and return-demonstration Immediate practice was done immediately on the same day by asking the patient to repeat each movement after the researchers. Then, it was repeated five days/ week for four weeks Telephone was used for encouraging the practice while during the period of radiation and continue for 12 weeks at home after completion of radiation sessions.

A structured colored booklet was used in providing

- Massage therapy was explained to the patient and family member in the study group. The proposed massage therapy was adapted from (Hegazy et al., 2022). The patient was instructed to receive a 10-minute Swedish massage of shoulder muscles of the affected upper limbs; kneading of the trapezius muscle, the muscles around the rotator cuff, the supraspinatus muscle, and the infraspinatus muscle
- At the same time, of massage assist the patient to perform back extension exercise of the shoulder joint. The strength of the traction was based on the degree of the patient's pain sensitivity, with an average of three times a day for 10 minutes each time for the study period (16 week).
- The researchers asked the family member to prepare the environment; the room should be quiet and dim lighting, maintain the patient's privacy then the patient takes off her clothes and assume a prone position, pillows and towels were put beneath the patient's head and legs to ensure her comfort. The researchers asked the family member to use baby oil and rubbing hands together to warm it and started to distribute the oil on the selected parts for massage to prevent the friction and promote comfort Family members were instructed about how to apply swedish massage to the patients in the intervention group using long strokes and gliding motion massage technique with mild pressure using palm of the hand, for greater pressure on the muscle use the edges the hand and kneading of the muscle using the palm of both hands for five min.
- Thumb and fingertips were used to apply penetrating pressure over the muscle to demonstrate friction technique for five min and ending mild pressure using the palm of both hands. After the massage session was completely performed, the family member assisted the patient in wearing her clothes and assuming setting position.

Rehabilitation exercises

were divided into four phases; each patient performed the following exercises for study period from the beginning of radiotherapy to 16 weeks (the period of data collection).

- **Phase 1** consisted of the following movements: The isometric handgrip exercise: This exercise is performed by using stress ball which was performed for two min of five

contractions and five rest-pause intermittently per set, three to five sets per day. The isotonic muscle contraction exercises of the wrist and elbow: Full range of motion for the elbow and rest joint (not loaded). The patient was asked to bend the arm toward the chest until the fingers touch the shoulder then extend the arm beside the body, repeat for 10–15 times per set in each direction, three sets per day. Isometric muscle contraction of the shoulder joint: Range of motion (ROM) for the shoulder joint was performed slowly in both the flexion and abduction directions. Muscles will be allowed to contract using weight (0.5Kg) for 10 s and rest for five s, 10–15 times per set in each direction, three sets per day.

- **Phase 2** used isotonic muscle contraction of the shoulder joint in both flexion and abduction. The appropriate ROM for patients was performed with (gravity as the load). All was performed for 10–15 times per set in each direction, 3 sets per day.
- **Phase 3** involved active muscle stretching of the shoulder flexion and abduction. The patient was asked to face or side face the wall, place the hand on the wall, and slowly crawl fingers upward. When the patient felt that the armpit had a slight pulling or pain he asked to stop moving the fingers, 20–30 s, and then slowly moved the arm away from the wall. The same movement will be repeated 10–15 times per set, three sets per day.
- **Phase 4** involved shoulder flexion and abduction. The appropriate ROM shoulder flexion and abduction for patients was performed with using resistance as the load (hold a small bottle of water). The patients allowed lifting the weight repetitively for eight to 15 times per set in each direction, three sets per day. At the end of the session there was 15-20 minutes, the researchers made conclusion and obtain feedback and the educational booklet was given to the study group. At the second session of intervention (after four weeks) data was collected from patients using the instruments listed before and patients was informed about how to use measuring tape at home for measuring arm circumference during follow up period after (12 weeks).
- During follow up period, the researchers reinfor the participants of the study group by phone to reinstruct them about the importance of adherence to exercises and written instructions in the booklet.
- Each patient was assessed three times throughout the study period: the first time at the beginning of radiotherapy (pre intervention) then four weeks post radiotherapy (post intervention) and finally after 12 weeks post radiotherapy (follow up) at the oncology outpatient clinic and by telephone for patient who didn't attend the outpatient using study instruments II (Zung Self-Rating Anxiety Scale (SAS)) and instrument III (VAS).

Results

Table 1 displays distribution of socio-demographic and personal data for both study and control group of breast cancer patients undergoing radiotherapy shows that the mean age for the study and control group were 47.74 ± 8.98 and 49.5 ± 8.3 respectively. Additionally a higher percentage of individuals in both groups were married (74% of the study group and 62% of the control group). In terms of education, approximately one-third of the participants had a secondary education (36% of the study group and 30% of the control group). There was no statistical significant difference between both groups regarding socio-demographic data

Table 2 displays the past medical history of the studied sample and shows that all of sample (100% of both groups) had previously hospitalized. 20% of the study group compared to 34% of the control group suffered from chronic disease. There were no statistically significant differences between the study and control groups regarding all medical and past history, where the P value was > 0.05. The mean BMI for the study and control groups were 31.2±4.85and 31.5±4.2, respectively. Additionally the higher percentage of the study group (40%) had cancer for more than a year, while 36% of the control group had cancer one year ago. More than half of studied subjects (54% of the study group and 60% of the control group) had cancer in stage two. conservative and radical mastectomy were the most common surgeries among the study group (36.0% and 36.0% respectively) while half of (50%) control group had radical mastectomy. Majority of studied patients received linear radiation (86% for the study group and 96% for the control group). The radiation sessions schedule was 15 sessions every 3 weeks for about half of the sample (48% of the study group and 50% of the control group).

There were no statistically significant differences between the study and control group regarding medical data, with a P-value > 0.05.

Table (3): shows that there were highly statistical significant differences in mean anxiety score were existed between the study and control groups post-intervention at four and 12 weeks of intervention, with p-values 0.000. These differences favor the study group, with mean scores of 47.54±9.67 at four weeks post intervention, and 29.44±5.51 at follow up (after12 weeks) of intervention.

Table5: shows that the study group had a remarkable decrease in the total mean pain score at post intervention and follow up (6.1±1.3, 2.44±0.73 respectively) as compared to pre intervention (7.5±1.63). While for the control group the total mean pain score at post intervention and follow up (9.1±1.08, 8.5±1.49 respectively) as compared to pre intervention (7.3±1.38).

Figure (1) shows that at pre intervention; 52% of the study group as compared to 48% of the control group had marked to severe anxiety. While at four weeks after radiotherapy; 20% of the study group as compared to 56% of the control group had marked to severe anxiety. By the 12-weeks after

radiation, 100% of the study group experienced no anxiety as compared to 72% of the control group experienced extreme anxiety

Figure (2) illustrates that prior to the intervention, the majority of participants in both group experienced severe pain (50% in the study group and 44% in the control group). After four weeks of radiation treatment, 34% of the study group reported severe pain compared to 52% in the control group. However, no patient of the study group (0%) and near two third of control group (64%) reported severe pain after 12 weeks after radiation therapy.

Table (1): Distribution of Patients in the study and control groups according to Their Socio-demographic (n=100)

Personal data	Study (n=50)		Control (n=50)		Test of significance	p-value
	N	%	N	%		
Age						
Mean ± SD	47.7±8.98		49.5±8.3		t= 1.005	0.317
Marital status						
Single	2	4.0	7	14.0	X^2= 4.59	0.204
Married	37	74.0	31	62.0		
Divorced	3	6.0	6	12.0		
Widow	8	16.0	6	12.0		
Educational level						
Illiterate	11	22.0	12	24.0	X^2= 1.18	0.757
Read and write	10	20.0	14	28.0		
secondary education	18	36.0	15	30.0		
High education	11	22.0	9	18.0		
occupation						
Manual work	5	10.0	2	4.0	X^2= 2.66	0.447
Office work	9	18.0	14	28.0		
House wife	19	38.0	18	36.0		
Don't work	17	34.0	16	32.0		
Residence						
Rural	26	52.0	23	46.0	X^2= 0.36	0.548
urban	24	48.0	27	54.0		

Statistically significant at $P \leq 0.05$

Table 2: Distribution of Patients in the Study and Control Groups according to Their Characteristics (N=100)

Past medical history	Study (n=50)		Control (n=50)		Test of significance	p-value
	N	%	N	%		
Previous hospitalization						
Yes	50	100.0	50	100.0	X^2= --	P =--
No	0	0.0	0	0.0		
Mean ± SD	12.7±4.1		14.3±5.6		Mann Whitney U= 1.73	0.084
Chronic diseases						
Yes	10	20.0	17	34.0	X^2= 2.49	0.115
No	40	80.0	33	66.0		
Type of chronic disease (no=27)						
Hypertension	6	60.0	8	47.1	X^2= 1.34	0.512
respiratory disease	2	20.0	2	11.8		
Diabetes Mellitus	2	20.0	7	41.1		
Previous breast surgery						
Yes	50	100.0	50	100.0	X^2= --	(>0.05)
No	0	0.0	0	0.0		
Body Mass Index						
Normal weight (18.5- 24.9)	5	10.0	3	6.0	X^2 =1.99	0.737
Over weight (25- 29.9)	16	32.0	15	30.0		
Obesity Class I (30-34.9)	18	36.0	22	44.0		
Obesity Class II (35- 39.9)	8	16.0	9	18.0		
Obesity Class III (> 40)	3	6.0	1	2.0		
Mean ± SD	31.2±4.85		31.5±4.2		t = 0.340	P =0.734
Duration of breast cancer						
Less than a year	15	30.0	13	26.0	X^2= 0.719	0.698(>0.05)
A year	15	30.0	19	38.0		
More than a year	20	40.0	18	36.0		
Affected side of cancer						
Right	31	62.0	31	62.0	X^2= 1.12	0.572(>0.05)
Left	18	36.0	16	32.0		
Both	1	2.0	3	6.0		
Stage of the disease						
Stage one	16	32.0	14	28.0	X^2= 0.468	0.832(>0.05)
Stage two	27	54.0	30	60.0		
Stage three	7	14.0	6	12.0		
Type of surgery						
Conservative	18	36.0	21	42.0	X^2= 7.88	0.096 (>0.05)
Partial mastectomy	1	2.0	0	0.0		
Modified radical mastectomy	13	26.0	4	8.0		
Radical mastectomy	18	36.0	25	50.0		
Radiotherapy device						
Liner	43	86.0	48	96.0	FE= 3.05	0.081 (>0.05)
Copelt	7	14.0	2	4.0		
Number of radiation session						
15 session/3 weeks	24	48.0	25	50.0	X^2= 0.055	0.973 (>0.05)
19 session/3 weeks	15	30.0	14	28.0		
20 session/3 weeks	11	22.0	11	22.0		
completed all required sessions						
Yes	50	100.0	50	100.0	X^2= --	(>0.05)
No	0	0.0	0	0.0		

Table 3: Mean Scores of Anxiety Psychological and Physical Aspects among Patients in the Study and Control Groups Pre intervention, Post and at Follow-up

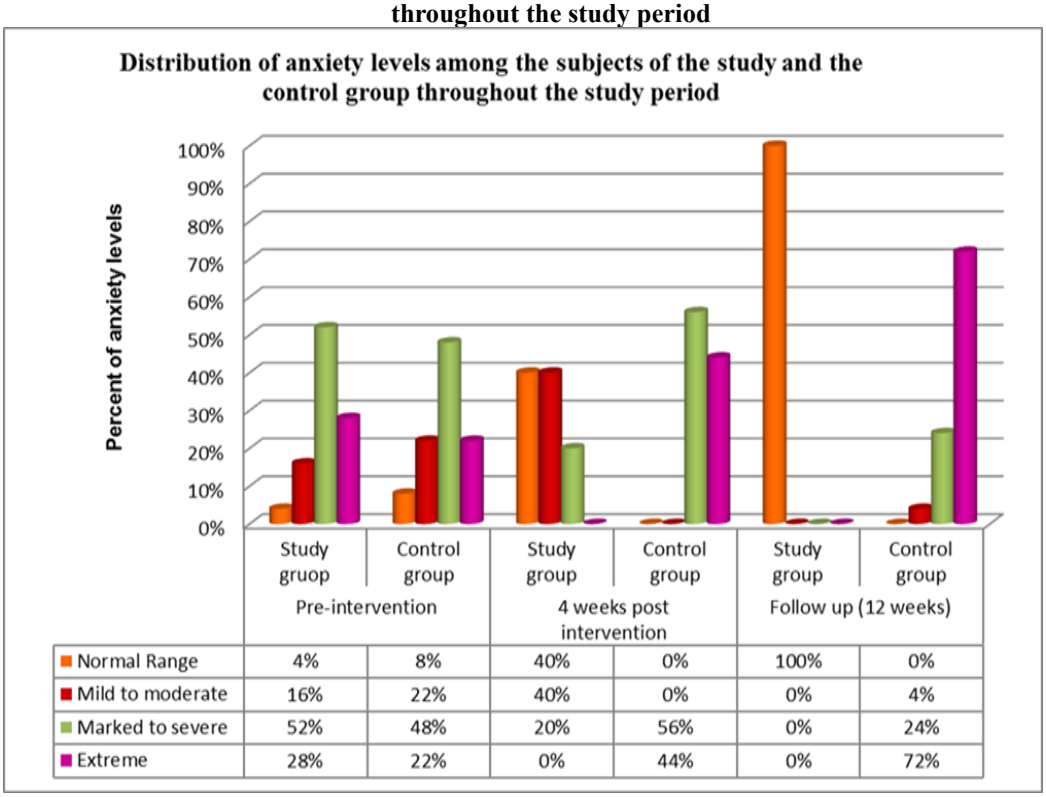
Mean total (SAS)	Pre-intervention		4weeks post intervention		Follow-up after 12 weeks		ANOVA Test	ANOA Test
	Study group (n=50)	Control group (n=50)	Study group (n=50)	Control group (n=50)	Study group (n=50)	Control group (n=50)	Study group	control group
	(x̄±SD)		(x̄±SD)		(x̄±SD)		F& p-value	F& p-value
Psychological Aspect	24.42±3.80	23.44±2.60	17.34±3.79	26.56±2.03	11.08±2.66	26.08±3.45	F=1153.79 p=0.000**	F=18.20 p=0.000**
Independent t-test P-value & t	T=1.51 P=0.135		T= 15.166 P=0.000**		T= 24.302 P= 0.000**			
Physical Aspect	43.10±7.304	41.02±4.81	30.20±6.81	47.14±3.40	18.36±4.36	49.46±3.90	F=708.93 p=0.000**	F=68.68 p=0.000**
P-value & t	T= 1.68 P=0.09		T= 15.74 P=0.000**		T= 37.58 P=0.000**			
Mean Total Score of SAS	67.52±10.35	64.46±6.28	47.54±9.67	73.70±4.71	29.44±5.51	75.54±6.77	F=1123.67 p=0.000**	F=54.22 p=.0.000**
P-value & t	T= 1.79 P= 080		T=17.20 P=0.000**		T= 37.33 P=0.000**			

Table 5: Mean Scores of Pain among Patients in the Study and Control Groups on Pre, Post Intervention and at Follow-up

The mean pain score	Study (n=50)		Control (n=50)		Test of significance	p-value
	N	%	N	%		
pre intervention						
Mean ± SD	7.5±1.63		7.3±1.38		Mann Whitney U= 0.717	0.473(>0.05)
post (four weeks) intervention						
Mean ± SD	6.1±1.3		9.1±1.08		Mann Whitney U= 7.64	0.00**(≤0.001)
follow up (after 12 weeks) intervention						
Mean ± SD	2.44±0.73		8.5±1.49		Mann Whitney U= 8.73	0.00**(≤0.001)
Kruskal Wallis H test and P value	**H1= 4.91, P1= 0.00** H2= 6.2, P2= 0.00****		**H1=5.85, P1=0.00** H2= 6.28, P2= 0.00****			

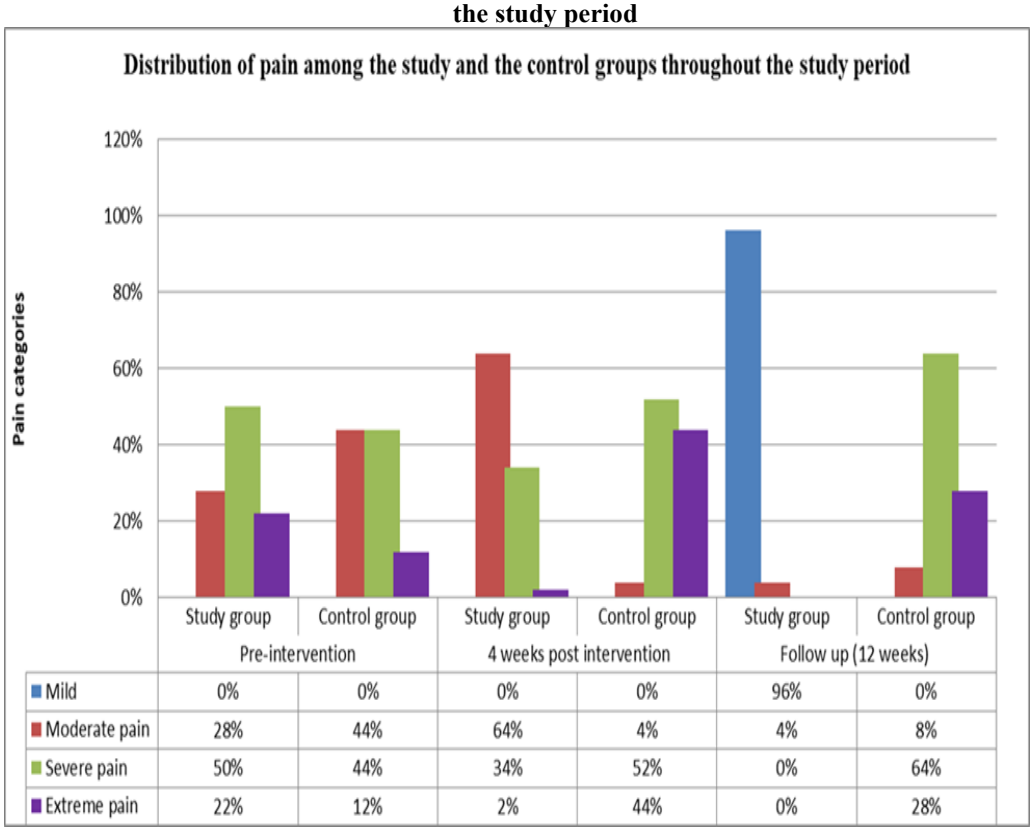
H1, P1 relation of post intervention to pre intervention, H2, p2 relation of follow up intervention to pre intervention

Figure (1): Distribution of anxiety levels among the subjects of the study and control groups throughout the study period



	Pre-intervention		4 weeks post intervention		Follow up (12 weeks)	
	Study gruop	Control group	Study group	Control group	Study group	Control group
Normal Range	4%	8%	40%	0%	100%	0%
Mild to moderate	16%	22%	40%	0%	0%	4%
Marked to severe	52%	48%	20%	56%	0%	24%
Extreme	28%	22%	0%	44%	0%	72%

Figure (2): Distribution of pain categories among the study and the control groups throughout the study period



	Pre-intervention		4 weeks post intervention		Follow up (12 weeks)	
	Study group	Control group	Study group	Control group	Study group	Control group
Mild	0%	0%	0%	0%	96%	0%
Moderate pain	28%	44%	64%	4%	4%	8%
Severe pain	50%	44%	34%	52%	0%	64%
Extreme pain	22%	12%	2%	44%	0%	28%

Discussion

Breast cancer diagnosis can produce stress, anxiety a sense of lack of control over females' lives, fear, and powerlessness because of their illness. These feelings intensify when deciding on and undergoing complex breast cancer treatments, such as surgery, radiation therapy, chemotherapy, and/or hormonal therapy. They are also having a higher rate of anxiety related to fear of pain, cancer recurrence, and death (Zhang et al., 2023).

For anxiety level among patients in the study and control group, the present study findings revealed that post intervention there were highly statis tical significant differences between levels tical significant differences between levels of anxiety among patients-in the study and control.

The study group showed a notable decrease in the (SAS) score, while the control group experienced a significant increase. This result was congruent with Li et al., (2021) who conducted a study in china which entitled "Effects of evidence-based nursing on psychological well-being, postoperative complications and quality of life after breast cancer surgery"and reported that there were significant difference in SAS scores between both groups after intervention, and the scores in observation group were significantly lower than those in control group after intervention.

Also, Ali & Adam (2022) reported that patients in the study group showed a highly statistically significant difference regarding minimizing the total anxiety in the post program phase as compared to the pre-program phase.

Zhang et al., (2023) also reported that after the application of the evidence-based nursing program in the study group, the indicators of Self Rating Depression Scale (SDS) and Self Rating Anxiety Scale (SAS) scores of the patients were significantly improved higher than the control group patients.

Cole et al., (2024) conducted a systemic review at USA and concluded that massage therapy was effective as a non-pharmacological method in decreasing post-surgical pain and anxiety in women with breast cancer. Also, Xu et al., (2022) conducted a study entitled "Application of nursing intervention plan based on symptom management theory among breast cancer patients" in China and reported that there were no obvious differences regarding SAS score between both groups before intervention while SAS score was obviously reduced in the intervention group as compared to control group post intervention.

The results of the current study supported the first hypotheses which showed that patients who implemented the nursing intervention (Study group) would exhibit low anxiety level than patients who didn"t (control group). From the researcher's point of view, the use of EBN intervention included rehabilitation exercise, Swedish massage and health education) may ease the anxiety by releasing feel-good endorphins that can improve the sense of well-being.

Concerning pain score throughout the study period among studied groups. the findings of the current study revealed

that there was a highly significantly decrease in pain score among study group versus control group post four weeks of intervention and at follow up. These results were agreeing with Chen et al., (2019) who studied "Effect of rehabilitation training on improving upper limb physical function of breast cancer patients" in China reported that there was significant improvement in pain score within study group as compared to control group post intervention. Lin et al., (2023) who studied "Effect of exercise on rehabilitation of breast cancer surgery patients" in China reported that aerobic exercise reduced the intensity of the pain among breast cancer patients.

Ferrara et al., (2024) who studied "An update on rehabilitative treatment of shoulder disease after breast cancer care" in Italy and reported that physiotherapy alone or in combination with other techniques significantly reduced pain among patients undergoing breast cancer treatment regardless of their baseline characteristics or the time passed from surgery. Austin et al., (2023) who studied "Efficacy of aerobic and resistance exercises on cancer pain" in Australia reported that the study group who practised exercise therapy had a decreases in cancer-related pain compared to control group.

The results of the current study supported the second hypotheses which stated that "patients receiving radiotherapy for BC who implemented the nursing intervention (Study group) exhibited low anxiety level than patients who don't (control group)". From the researcher's point of view, Swedish massage and rehabilitation exercises might reduce excitability of central neurons in the central nervous system, and increase the release of endogenous opioids and serotonin in the brainstem pain inhibitory pathways therefore decreasing pain sensation.

Conclusion

- Nursing intervention (health education, rehabilitation exercises and swedish massage) had a significant effect on reducing anxiety level and improving pain score among study group patients than control group.

Recommendations

- The nursing staff at radiotherapy should be encouraged to use nursing intervention (health education, rehabilitation exercises and swedish massage) for breast cancer patients before, during and after radiotherapy to reduce patient's anxiety level and reliving their pain.
- Colored illustrative booklets should be distributed between breast cancer patients undergoing radiotherapy to be oriented about radiotherapy and its complications and how to overcome.
- Further research should be encouraged to investigate the long-term effects of nursing intervention (health education, rehabilitation exercises and swedish massage) on the prognosis and outcomes of patients with breast cancer.
- A similar study can be replicated at different settings and on large probability samples to allow for greater generalization of the findings.

References:

Abreu, A. M. D., Fraga, D. R. D. S., Giergowicz, B. B., Figueiró, R. B., & Waterkemper, R. (2021). Effectiveness of nursing interventions in preventing and treating radiotherapy side effects in cancer patients: a systematic review. Revista da Escola de Enfermagem da USP, 55, e03697.

Ali, N., & Adam, S. (2022). Effect of Psycho- educational Program on Depressive Symptoms, Anxiety and Stress Coping Strategies among Women with Breast Cancer. Egyptian Journal of Health Care, 13(4), 1220-1240

American Cancer Society (2023). Cancer Facts and Figures. Atlanta, Ga: American Cancer Society; 2023. Available at: https://www.cancer.org/cancer/types/breast-cancer/about/how-common-is-breast. Retrieved on 11/2 /2024.

Austin, P. D., Lee, W., Costa, D. S., Ritchie, A., & Lovell, M. R. (2024). Efficacy of aerobic and resistance exercises on cancer pain: A meta-analysis of randomised controlled trials. Heliyon, 10(7).

Bahceli, P. Z., Arslan, S., & Ilik, Y. (2022). The effect of slow-stroke back massage on chemotherapy-related fatigue in women with breast cancer: An assessor blinded, parallel group, randomized control trial. Complementary Therapies in Clinical Practice, 46, 101518.

Bian, G., Kuwahata, H ., Raymond, B & Foster, R. (2005).Tea tree/hydrogel dressing used in wound care .Rural Industries Research and Development Corporation. Available at http://www.rirdc.gov.au/reports/TTO/05-114.pdf

Boonstra, A., Schiphorst, P., Henrica, R ., Michiel, F., Jitze, B & Roy, E (2008). Reliability and validity of the visual analogue scale for disability in patients with chronic musculoskeletal pain. International journal of rehabilitation research; 31(2):165-9

Chen, X., Xue, X. M., Bian, X. R., Shao, W. W., Qin, Y., & Wang, Y. Q. (2019). Effect of rehabilitation training on improving upper limbphysical function of breast cancer patients. Chongqing Medicine, 48,4309–4312

Cole, J. S., Olson, A. D., & Dupont-Versteegden, E. E. (2024). The Effects of Massage Therapy in Decreasing Pain and Anxiety in Post-Surgical Patients With Breast Cancer: A Systematic Review and Meta-Analysis. Global Advances in Integrative Medicine and Health, 13, 27536130241245099.

De Baets, L., Vets, N., Emmerzaal, J., Devoogdt, N., & De Groef, A. (2024). Altered upper limb motor behavior in breast cancer survivors and its relation to pain: A narrative review. The Anatomical Record, 307(2), 298-308.

Ferrara, P. E., Gatto, D. M., Codazza, S., Zordan, P., Stefinlongo, G., Ariani, M., ... & Ronconi, G. (2024). An update on rehabilitative treatment of shoulder disease after breast cancer care. Musculoskeletal Surgery, 108(1), 31-45.

Gol1, M and Aghamohamadi, D (2020). Effect of Massage Therapy With and Without Elastic Bandaging on Pain, Edema, and Shoulder Dysfunction After Modified Radical Mastectomy: A Clinical Trial; International Journal of Women's Health and Reproduction Sciences; 8 (1):73–8.

Hegazy, S., Mounier, H., Awad, A., & Abd Elhameed, S (2022). Effect of Massage Therapy on Minimizing Fatigue among Elderly Women with Breast Cancer. International Journal of Novel Research in Healthcare and Nursing, 9(3) , 134-147.

Ibraheim, S. G. E., Shedeed, W. K., & Abdelaziz, N. S. (2024). Breast Cancer Preventive Program among Women According to Sustainable Development Strategy 2030. International Egyptian Journal of Nursing Sciences and Research, 4(2), 376-393.

Li, Y., Zhang, X., Zhang, L., & Wang, W. (2021). Effects of evidence-based nursing on psychological well-being, postoperative complications and quality of life after breast cancer surgery. American journal of translational research, 13(5), 5165–5173.

Lin, C., Liu, H and Cheng, M. (2020). Factors associated with professional healthcare advice seeking in breast cancer-related lymphedema. J Surg Oncol.;121(1):67–74.

Lin, Y., Chen, Y., Liu, R., & Cao, B. (2023). Effect of exercise on rehabilitation of breast cancer surgery patients: A systematic review and meta-analysis of randomized controlled trials. Nursing open, 10(4), 2030-2043.

Linlin, Q (2021). Effect of Group Intervention Combined with Massage Nursing on Patients with Lymphedema Journal of Clinical and Nursing Research; 5(2):29-32.

Liu, B (2020). Application of high quality nursing intervention to prevent upper limb lymphedema in patients with breast cancer. China Health Nutrition; 30 (2): 194

Mugundhan, S. L., & Mohan, M. (2024). Nanoscale strides: exploring innovative therapies for breast cancer treatment. RSC advances, 14(20), 14017-14040.

Qiu, L., Wu, J., Huang, Y., Ye, M., Song, L., Huang, H., & Jin, Y. (2024). Protocol: Comparison of the effects of different functional exercise sequences on lymphedema in breast cancer: protocol for an exploratory randomised controlled cross-over trial. BMJ Open, 14(3).

Ramirez, Z and Lukenbill, J (2008). Psychometric properties of the zung selfrating scale for people with a mental handicap. J. Mental Defic. Res; 32 (6): 485–490.

Wang, X., Lai, Q., Tian, Y., & Zou, L. (2020). Effect of evidence-based nursing intervention on upper limb function in postoperative radiotherapy patients with breast cancer. Medicine, 99(11), e19183.

Xu, Q., Chen, Y., Shen, X., & Fang, Q. (2022). Application of Nursing Intervention Plan Based on Symptom Management Theory among Breast Cancer Patients. Contrast media & molecular imaging, 2022(1), 3816768.

Zhai, W (2020). Effects of human care on ESCA scores of patients with upper extremity lymphedema after breast cancer surgery. Capital Food and Medicine;27(19):162-3.

Zhang, Q., Lin, L., Zou, M., Jiang, J., & Wu, Y. (2023). Application of evidence-based nursing in postoperative radiotherapy care for breast cancer. Precision Medical Sciences, 12(3), 177-181.