EFFECT OF DESIGNATED NURSING INTERVENTION PROGRAM ON THE SEVERITY OF LYMPHEDEMA AMONG PATIENTS WITH BREAST CANCER SURGERY

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Abstract

Abstract: cancer related lymphedema is a serious clinical problem, associated with high rates of morbidity, mortality, prolonged hospital stay and increasing medical treatment costs.
Aim: To evaluate the effect of designated nursing intervention program on the severity of lymphedema among patients with breast cancer surgery.
Design: A quasi experimental design was utilized for data collection.
Setting: This study was carried out in surgical and outpatient unit in Fayoum University Hospital.
Sample: A purposive sample composed of 80 adult patients who were randomly and alternatively divided into two equal groups.
Tools of data collection: Interview Patient's assessment sheet, knowledge assessment questionnaire, patient's practices observational checklist, lymph edema tracking assessment tool and upper arm functional index assessment tool.
Results: The study revealed that there was a significant difference in knowledge, self-care practice and performance of exercises and lymphedema severity among study groups.
Conclusion: The application of designated nursing intervention program is effective on reducing the severity of lymphedema among breast cancer patients.
Recommendation: Designated nursing intervention program should be added to routine nursing care delivered to post-operative breast cancer patients.

Keywords: Designated nursing intervention program, breast cancer, lymphedema, self-care practice

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1. INTRODUCTION

Breast cancer is a pathologic entity that starts with a genetic alteration in a single cell and may take several years to become palpable. Various treatment options are available for breast cancer management such a surgery, radiotherapy, chemotherapy, or hormonal therapy or a combination of therapies. The objectives of breast cancer management are the eradication of the cancer cells, prolongation of life, and improved quality of life, Physical functioning and well-being **(Awad & Abd-El Wahab, 2022).**
Complications associated with breast cancer management including the risk of developing lymphedema. Lymphedema is an abnormal and regional accumulation of protein-rich fluid in the interstitial space that can cause edema and chronic inflammation. It is clinically characterized by chronic swelling, localized pain, atrophic skin changes, secondary infections, significant impact on activities of daily living, a changed view of self, reduced physical activity and lower quality of life **(Boshra, 2022).**
Lymphedema remains a major source of morbidity for breast cancer survivors it is a life-long concern once it develops. The progressive nature and lack of effective therapies continue to challenge health workers. Specific nursing intervention and restoration of functioning of the arms in the affected side after mastectomy and axillary lymph node dissection is one of the important goals of the nurse **(Cansız et al., 2022).**
The prevention of these complications can be accomplished through the use of appropriate care. These actions belong to the nurse and to the patient who must be instructed in self-care strategies to prevent the initial development of lymphedema which is the first step in lymphedema prevention. The

knowledge of those care information is essential, as it influence the attitude and the proper practice of self-care of patients, failure to comply with these precautions may complicate the clinical condition of patients which will lead to interventions more complex and/or hospitalizations **(Chen et al., 2022).**

Significance of Study:

It has been estimated that in 2018, there were over 2 million new diagnoses of breast cancer worldwide. It is a common cancer form among women globally and represents 16% of all female cancers. It is considered the second death-leading cause after lung cancer among women in the U.S and accounts for 18.2% of all cancer death. The American Cancer Society reported an estimated 252,710 new cases of invasive breast cancer diagnoses among women in 2017 **(Deveci et al., 2021).**

In Egypt according to the National Cancer Institute, about 37.5% of all Egyptian female cancers are breast cancer patients. It has been estimated that by 2050 the incidence of cancer will be 3-fold that in 2013 **(Abd El-Moneam & Elhosany, 2017).** In fayoum University Hospital, the number of patients undergoing breast cancer surgery during the period between 2018 -2019 presented to the surgical department was approximately 104 cases (Statistics and medical record department fayoum University Hospital, 2020).

Lymphedema is one of the main and most fearful complications of breast cancer and its therapies. The incidence of breast cancer–related lymphedema has been hard to measure because of postponed onset of symptoms and absence of standardized diagnostic criteria. Recent studies showed that 50 -60% of women who treated the breast cancer by surgery develop lymphedema **(Drury et al., 2022).**

Aim of the study:

The aim of this study was to evaluate the effect of designated nursing intervention program on the severity of lymphedema among patients with breast cancer surgery.

1. Asses needs of patients with breast cancer surgery.
2. Develop designated nursing intervention program for patients with breast cancer surgery.
3. Implement designated nursing intervention program for patients with breast cancer surgery.
4. Evaluate the effect of designated nursing intervention program for patients with breast cancer surgery.

2. Theoretical Framework

This study utilized the Orem's theory because the vast application of this theory in clinical practice.

Theoretical Framework

Simmons & Dishman, (2019) pointed that, Orem's nursing system theory indicates that nursing is a role that encompasses interaction and educating patients through one-on-one interactions health prevention can be accomplished. Nursing system theory works to help the patient achieve a high level of wellness by providing patients with the tools and education they need to be successful. The role of the nurse is to maintain or improve a patient's state of health. Patient education on self-care behaviors allows the patient to be self-reliant and responsible for identifying when new illnesses may exist.

Naz & Sehrish, (2021) described nursing process as a method to determine the self-care deficits and then to define the roles of person or nurse to meet the self-care demands. These steps within the approach are considered to be the technical component of the nursing process. Orem emphasizes that the technical component must be coordinated with interpersonal and social processes within nursing situations.

Concepts of the study:

Assessment

Conceptually: the nurse should obtain data from the patient who will guide the planning of care and its implementation. First the nurse needs to assess those demands being made on the individual self-care, determine the person's self- care and dependent care agency and finally evaluate self-care or dependent-care deficit including its magnitude and the primary reason for it. These may include identifying whether an individual possess the knowledge necessary to respond to self-care demands and assessing his or her motivation, development and past experience. Also during assessment the nurse must also assess whether the individuals present state allows for safe involvement in self-care. Finally the nurse assesses the patient potential for re- establishing self-care in the future **(Younas, 2017).**

Operationally: assessment in the study is to determine patient needs through assess patient knowledge regarding breast cancer, lymphedema, self-care practices and assessment patient performance of post-operative exercises.

Nursing diagnosis

Conceptually: The nursing diagnosis will be derived from data gathered during the assessment. The main outcome of care is to establish the patient self-care ability. Depending on the nursing diagnosis the nurse should establish the nursing outcome, the expected patients' outcome. Also, the etiology component of nursing diagnosis directs actions **(Githemo, 2017).**

Operationally: based on assessment nursing diagnosis provides the basis for selection of nursing interventions to achieve outcomes for which the nurse is accountable which include actual problems including knowledge deficit related to breast cancer, lymphedema, self-care practice and post-surgery exercises. Potential problems including risk for post-operative complications such as lymphedema &arm functions disabilities.

Planning

Conceptually: Nurse designs a nursing system that is wholly or partly compensatory or supportive-educative. Bringing out a good organization of the components of patients' therapeutic self-care demands .Selection of combination of ways of helping that will be effective and efficient in compensating for overcoming patient's self-care deficits. Planning and goal setting phase all goals will be patient centered. The long term goal is the restoration of balance between self-care abilities and self-care needs **(Yip, 2021).**

Operationally: Planning anticipates the implementation phase of nursing actions that are specific for post cancer surgery patients; Planning for actual problems is to educate patients about breast cancer, lymphedema, self-care practice and post-surgery exercises. Plan for potential problems is to reduce post-operative complications such as lymphedema and arm functions disabilities.

Implementation

Conceptually: Orem's model assumes that patients are willing and able to adopt certain roles and that they desire to achieve self-care. Orem identifies five methods of helping that a nurse may use; acting for and doing for others, guiding others, supporting another, providing an environment promoting personal development in relation to meet future demands or teaching another. Therefore, the main goal of nursing during the implementation phase to ensure that self-care is re-established or maintained. After the interventions the nurse should evaluate whether the goals of nursing have been achieved **(Roy, 2021).**

Operationally: In this study, the researcher carries out the designated nursing intervention which involves teaching patients about breast cancer, lymphedema, self-care practice. Acting and demonstrate for patient to educate them about post-operative exercises. These interventions were done to achieve the expected goals.

Evaluation

Conceptually: the nurse should focus on determining whether the patient has been able to maintain or re-establish the balance between self-care abilities and self-care demands. By setting goals that are patient centered nurses put themselves in a position to evaluate whether patients have achieved self-care at the end of specified periods of time, rather than whether or not nursing intervention has been carried out. Hence moving from nursing interventions that are wholly or partly compensatory to those that are broadly supportive-educative by ensuring patient participation would also indicate effective nursing care **(Leone et al., 2021).**

Operationally: the researcher evaluates the effect designated nursing intervention firstly though evaluate patient's knowledge regarding breast cancer, lymphedema, self-care, exercises and assessment patient's performance of post-surgery exercises through using tools (II &III). Secondly to evaluate severity of lymphedema and upper arm functions disabilities tool (IV &V).

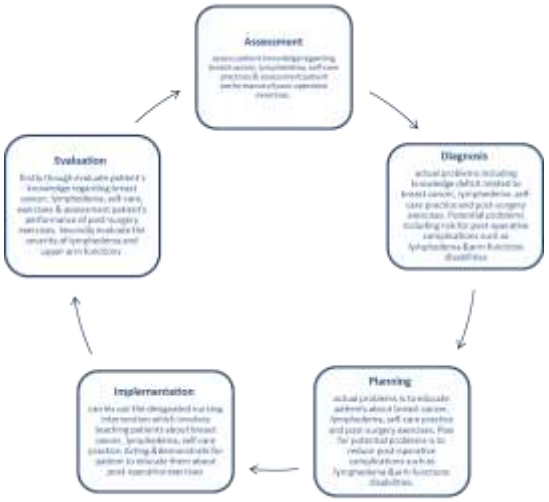

Figure (1): Nursing process according to Orem theoretical model for breast cancer surgery patients as developed by the researcher.

3. The research hypothesis

At the end of the study: Patients who will receive designated nursing intervention will have no or less severity of lymphedema than patients who will receive routine hospital care as measured by Patient's practices observational checklist tool and lymph edema tracking assessment tool.

Design:

A quasi-experimental design was used to identify a comparison group that is as similar as possible to the treatment group in terms of baseline (pre-intervention) characteristics. The comparison group captures what would have been the outcomes if the program/policy had not been implemented. Hence, the program or policy can be said to have caused any difference in outcomes between the treatment and comparison groups. A quasi-experimental design by definition lacks random assignment, however. Assignment to conditions (treatment versus no treatment or comparison) is by means of self-selection (by which participants choose treatment for themselves) or administrator selection) or both of these routes **(Miller et al., 2020).**

Setting:

This study was carried out at the surgical and outpatient unit at Fayoum University Hospitals, Fayoum governorate, Egypt. It is the only educational university hospital in Fayoum, and it receives patients from all areas of EL- Fayoum governorate.

Subjects:

A purposive sample composed of 80 patients which were randomly and alternatively divided into two equal study &control groups (40 for each).

Inclusion criteria:
•Patients from 18 to 60 years old.
•Patients who are posted breast cancer surgery with lymph node removal.
Exclusion criteria:
•Patients who are critically ill.
•Patients with any contraindication to the affected arm exercise (e.g. venous thrombosis).
Tools for Data Collection:
Five tools were used to collect the data according to the following:
Tool (1) Interview Patient's assessment sheet tool consists of two parts; part one covers socio-demographic assessment while part two covers health relevant information.
Tool (2) Patient's knowledge assessment sheet. **Tool (3)** Patient's practices observational checklist **Tool (4):** lymph edema tracking assessment tool. **Tool (5):** upper arm functional index assessment tool. Structured interviews and direct observation were utilized for data collection.
Operational design
The operational design includes preparatory phase, content validity of the modified tool and reliability, pilot study and fieldwork.
Validity:
Face validity is a subjective decision based on the researcher's feelings, thoughts, and intuition about the functioning of the measuring instrument. It is the simplest and least precise method of determining validity which relies entirely on the expertise and familiarity of the assessor concerning the subject matter; it is done by three expertise in medical surgical nursing and two surgical oncology medical expertise. Content validity as a qualitative form of validity that evaluates whether the expressions contained in the measuring instrument represent the phenomenon intended to be measured **(Sürücü et al., 2020).**
Reliability:
Reliability refers to the stability of the measuring instrument used and its consistency over time. Instrument reliability means that the instrument consistently reflects the construct that it is measuring by giving the same score if used over time or across multiple administrations. The Cronbach's alpha model, which is a model of internal consistency, was used to test tool reliability. Reliability factor of the second tool was 0.93, tool 3 was = 0. 93, tool 4 was = 0. 98 and tool 5 was = 0. 96. Statistical equation of Cronbach's alpha reliability coefficient normally ranges between 0 and 1; higher values (more than 0.7) denote acceptable reliability **(Al Jaghsi et al., 2021).**
Pilot study:
A Pilot study was carried out with 10% (8 patients) of the sample under study to test the applicability, clarity and efficiency of the tools, then the tools modified according to the results of the pilot study, patients who shared in pilot study were not included in the sample and replaced by other patients.
Administrative design:
An official permission was obtained from the director of Fayoum University Hospital and the head of surgical unit, in which the study was conducted. A letter was issued to them from the dean of the faculty of nursing; Helwan University explains the aim of the study for obtaining the permission for data collection.
Ethical consideration:
An approval was obtained from a scientific research ethics committee of the faculty of nursing at Helwan University and informed consent was obtained from the study subjects individually before starting the study. The aim and objectives of the study was clarified to the patients included in the study by the researcher. Participants were assured that anonymity and confidentiality would guarantee. Patients were informed that they are allowed to choose to participate or withdraw from the study at any time. Ethics, culture, values were respected.
Field Work: According to the selected theoretical framework of nursing process:
•An approval was obtained from a scientific ethical committee of the faculty of nursing at Helwan University.
•An official permission was obtained from the director of the fayoum University Hospital in which the study was conducted.
•The purpose of the study was simply explained to the patients or to their families who agree to participate in the study prior to any data collection.
•Written consent was obtained from each participant prior to data collection after explaining the aim of the study.
•Sampling was started and completed within twelve months from January 2021 to the end of February 2022; patients were having a follow up cards.
•The field work of the current study according to nursing process was included the following stages:
I. First phase (Assessment phase):
According to Orem's theory this phase is carried through interview with patients to review past medical and surgical history and to conduct a systems evaluation to identify processes that may affect the outcome of the patient's surgery. Initial assessment was done by the researcher for all study subjects in study and control groups to determine type of the undergoing surgery, history of previous surgery, presence of comorbidities, determining general condition of the patient.
Assess patient's level of knowledge using the previously mentioned tool (II). Filling the questionnaire in the morning and afternoon shifts in surgical unit during pre-operative period for both study and control groups. The patients were assured that information collected would be treated confidentially and it would be used only for the purpose of the research. Only code numbers were

used and no names appeared, its filling took about 30- 45minute for each patient.

Assess patient's practice in which researcher directly observing patient's performance by using patient's practice observational checklist tool (III), its filling took about 30- 45 minute for each patient.

II. Second phase (diagnosis phase)

According to Orem's theory diagnosis provides the basis for selection of nursing interventions to achieve outcomes for which the nurse is accountable, actual problems include knowledge deficit related to breast cancer, lymphedema, self-care practice and post-surgery exercises. Potential problems include risk for post-operative complications such as lymphedema and arm functions disabilities.

III. Third phase (planning phase)

According to Orem's theory planning for an actual problem is to educate patients about breast cancer, lymphedema, self-care practice and post-surgery exercises. Plan for potential problems is to reduce post-operative complications such as lymphedema and arm functions disabilities through use of media like booklet, video, simulation.

IV. Fourth phase (Implementation phase)

Implantation phase according to Orem's theory is carried through the following steps.

Education step (theoretical part including three sessions)

First session: it took 30-45 minute for each group including educating patients about breast cancer, breast cancer related lymphedema.

Second Session: it took 30-45 minute for each group for educating patient about routine self-care practices, self-care practices in case of complications.

Third session: it took 30-45 minute for each group to educating patient instructions about post breast surgery exercise.

Total time for theoretical part 90-135 minute for each group by using media such as posters, groups discussions and booklet

Acting step (practical part including six sessions)

First session: during this session the researcher acting and demonstrating for patients about first phase of post-surgery exercise deep breathing and pump up exercises by using simulator, videos on lab top media, this session took about one hour.

Second session: during this session the researcher provide revision on previous session then acting and demonstrating for patients about first phase of post-surgery wall climbing and side wall stretch exercises by using simulator, videos on lab top media, this session took about one hour.

Third Session: during this session the researcher firstly review previous session then acting and demonstrating for patients about second phase post-operative exercises rope turning, pulley exercises and how to re-demonstrate each one. It took about one hour researcher use video, simulator, booklet, pictures.

Fourth Session: during this session the researcher firstly review previous session then acting and demonstrating for patients about second phase post-operative exercises wand, shoulder shrugs exercises and how to re-demonstrate each one. It took about one hour researcher use video, simulator, booklet, pictures.

Fifth Session: during this session the researcher firstly review previous session then acting and demonstrating for patients about second phase post-operative exercises arm lifts, shoulder blade squeeze exercises and how to re-demonstrate each one. It took about one hour researcher use video, simulator, booklet, pictures.

Sixth Session: during this session the researcher firstly review previous sessions then acting and demonstrating for patients about second phase post-operative exercises wringing the arm, side bends exercises and how to re-demonstrate each one. It took about one hour researcher use video, simulator, booklet, pictures. During follow up phase each patient in study group was seen two weeks following the last session to be sure that the instructions were followed correctly. Reinstruction, correction, and re-demonstration were offered.

V. Fifth phase (evaluation):

During this phase the researcher evaluate patient's level of knowledge during first weak following intervention using the same data collection tool (II), evaluate patient's level of practice two weeks following intervention using the same data collection tool (III), then evaluate severity of lymphedema and upper arm function disabilities one and three months following intervention by using same data collection tool (IV &V).

STATISTICAL ANALYSIS:

Data collected and coded to facilitate data manipulation and double entered into Microsoft Access and data analysis performed using the Statistical Package of Social Science (SPSS) software version 22 in windows 7 (*SPSS Inc., Chicago, IL, USA*).

- Simple descriptive analysis in the form of numbers and percentages of qualitative data, and arithmetic means as central tendency measurement, standard deviations as a measure of dispersion of quantitative parametric data.
- Paired t-test used to compare two dependent quantitative data.
- The P-value< 0.05 was considered as statistical significant.

4. RESULTS

Table (1): Number and percentage distribution of the studied subjects according to their socio-demographic characteristics (n=80).

Variables	Study group (n=40)		Control group (n=40)		Test	p-value
	No.	%	No.	%		
Age						
Mean	44.3±9.4		45.3±10.6		-0.42	0.7
Marital status						
Single	24	60%	23	57.5%	0.05	0.9
Married	16	40%	17	42.5%		
Education level						
Illiterate	18	45%	18	45%	0.15	0.9
Read and write	14	35%	13	32.5%		
Basic qualification	4	10%	5	12.5%		
University	4	10%	4	10%		
Occupation						
Not Occupied	24	60%	29	72.5%	1.4	0.3
Occupied	16	40%	11	27.5%		
If work						
Manual work	9	56.3%	7	63.6%	0.15	0.9
Administrative work	7	43.7%	4	36.4%		

*Statistical significant p-value ≥0.05

Table (1): Illustrated that both study and control groups were between age of 45-55 years with the mean age 44.3±9.4 & 46.1±10.4 respectively, about more than half 60 & 57.5% in both studied groups were single, about half 45 % for both study and control groups couldn't read & write , more than two thirds 60% & 72.5 % for both study and control groups respectively weren't worked and more than half 56.3 & 63.6 for both study and control groups respectively were have manual work, with no statistically significant difference between both study and control groups with p value >0.05.

Table (2): Mean ± SD of patient's total knowledge scores for study group during pre and post-implementation of designated nursing intervention program (n = 80).

Knowledge items	Study group Pre	Study group Post	t-test	p-value
	Mean ± SD	Mean ± SD		
Total general knowledge score	2.4±4.03	25.9±5.7	21.9	<0.001*
Total knowledge about routine self-care	2.45±6.2	37.9±9.3	20.1	<0.001*
Total knowledge about self-care in case of complication	0.28±0.9	7.4±1.6	24.5	<0.001*

*Statistical significant p-value ≤ 0.05

Table (2): Illustrated that in study group there was high statistical significant difference in total mean ± SD scores of patient's general knowledge 2.4±4.03 & 25.9±5.7, there was high statistical significant difference in total mean ± SD scores of patient's knowledge about routine self-care 2.45±6.2 & 37.9±9.3 also, there was high statistical significant difference in total mean ± SD scores of patient's knowledge about self-care in case of complications 0.28±0.9 & 7.4±1.6 respectively during pre and post implementation of designated nursing intervention program with p-value <0.01.

Table (3): Mean ± SD of patient's total knowledge scores for study group during pre and post-implementation of designated nursing intervention program (n = 80).

Knowledge items	Control group Pre	Control group post	t-test	p-value
	Mean ± SD	Mean ± SD		
Total general knowledge score	3.8±3.4	8.3±7.9	3.3	<0.001*
Total knowledge about routine self-care	2.6±5.6	2.6±5.6	0	1

Total knowledge about self-care in case of complication	0.1±0.4	0.1±0.4	0	1

*Significant at P -Value < 0.05

Table (3): Illustrated that in control group there was statistical significant difference in total mean ± SD scores of patient's general knowledge 3.8±3.4 & 8.3±7.9, there was no statistical significant difference in total mean± SD scores of patient's knowledge about routine self-care mean ± SD scores 2.6±5.6 & 2.6±5.6 also, there no high statistical significant difference in total mean± SD scores of patient's knowledge about self-care in case of complication 0.1 ± 0.4 & 0.1±0.4 respectively during pre and post implementation of designated nursing intervention program with p-value 1.

Table (4): Mean ± SD of patient's total practice score for study group during pre and post-implementation of designated nursing intervention program (n = 80).

Practice items	**Study group pre**	**Study group Post**	**t-test**	**p-value**
	Mean ± SD	**Mean ± SD**		
practice total scores about post-operative exercises (first phase)	1.8±3.7	20±4.8	18	<0.001
total scores about post-operative exercises (second phase)	3.2±6.4	34.3±8.1	19.05	<0.001

*Significant at P -Value < 0.05

Table (4): Illustrated that in study group there was high statistical significant difference in total mean ± SD patient's practice scores regarding first phase of post-operative exercises 1.8±3.7 & 20±4.8 also, there was high statistical significant difference in total mean ± SD patient's practice scores regarding second phase post-operative exercises 3.2±6.4 & 34.3±8.1 respectively during pre and post implementation of designated nursing intervention program with p-value <0.01.

Table (5): Mean ± SD of patient's total practice score for control group during pre and post-implementation of designated nursing intervention program (n = 80).

Practice items	**Control group Pre**	**Control group post**	**t-test**	**p-value**
	Mean ± SD	Mean ± SD		
practice total scores about post-operative exercises (first phase)	1.5±2.4	1.5±2.4	0	1
total scores about post-operative exercises (second phase)	3.2±6.4	5.6±7.4	1.5	0.12

* Significant at P -Value < 0.05

Table (5): Illustrated that in control there was no statistical significant difference in total mean ± SD patient's practice scores regarding first phase of post-operative exercises 1.5±2.4 & 1.5±2.4 also, there was no statistical significant difference in total mean ± SD practice scores regarding second phase of post-operative exercises 3.2±6.4 & 5.6±7.4 respectively during pre and post implementation of designated nursing intervention program with p-value 0.12.

Table (6): Number and percentage distribution of patients' arm lymphedema presentation one and three month post implementation of designated nursing intervention program for both study and control groups (n= 80).

Lymphedema	**Study group**	**Control group**	**X^2-test**	**p-value**
Lymphedema after one month				
Present	4(10%)	5(12.8%)		
Lymphedema after three months				
Present	8(20%)	18(46.2%)		
X^2-test	2.5	6.7		
p-value	0.3	0.001*		

*Significant at P -Value < 0.05

Table (6): Illustrated that there 10% in study group in compare to 12.8% of patient in control group have developed lymphedema with no statistical significant difference in occurrence of lymphedema one month post implementation of designated nursing intervention program among both study

and control group with p-value <0.001 However, 20% of patient in study group in compare to 46.2% of patient in control group have developed lymphedema with statistical significant difference among both study and control group with p-value <0.001.

Table (7): Mean ± SD of patients' upper limb function index total scores one and three month post implementation of designated nursing intervention program for both study and control groups n= (80).

Upper limb function index	Study group n(40)	Control group n(40)	t-test	p-value
	Mean ± SD	Mean ± SD		
Total score after one month	2.6±3.8	4.8±3.8	-2.6	<0.001*
Total score after three months	1.8±3	6.2±4.4	-5.2	<0.001*

* Statistical significant p-value ≤0.05

Table (7): illustrated that in study group total mean ± SD of upper arm function index has been decreased from 2.6 ± 3.8 one month to 1.8 ± 3 three months post implementation of designated nursing intervention program while, in control group the Mean ± SD of upper arm function index has been increased from 4.8 ± 3.8 one month to 6.2 ± 4.4 three months post implementation of designated nursing intervention program with a lower mean statistical significant difference in total of upper arm function index score one and three months post implementation of designated nursing intervention program among both study and control group with p-value <0.001.

Table (8): Correlation between knowledge and practice score post implementation of designated nursing intervention program with study variables among study group

Variables	Knowledge score After		Practice score After	
	R	P-value	R	P-value
Lymphedema	2.8	0.008*	2.2	0.03*
Upper limb function index post one month	-0.81	0.001*	-0.80	<0.001*
Upper limb function index post three months	-0.85	0.001*	-0.83	<0.001*

*Significant at P -Value < 0.05

Table (8): pointed that there was high statistically significant positive correlation between knowledge, practice and lymph edema incidence post implementation of designated nursing intervention program among study group with p < 0.008*, 0.03 respectively. Also, there was a statistically significant negative correlation between upper limb function index score after one and three months among study group with knowledge and practice score post implementation of designated nursing intervention program with p-value <0.001.

5. DISCUSSION

The results of the present study demonstrated that, both study and control groups respectively were between age of 45-55 years, that about more than half them were single, about half for both study and control groups respectively were illiterate. also, more than two thirds for both study and control groups were not occupied and more than half for both study and control groups were have manual work with no statistically significant difference regarding socio demographic characteristic that indicate proper randomization of study this randomization is an indicator that variation between studied patients will be a result to the effect of the designated nursing intervention without bias.

This explanation goes with **Lim and In, (2019)** who conducted a study entitled "Randomization in clinical studies" concluded that proper randomization ensures no a priori knowledge of group assignment (ie, allocation concealment). That is, researchers, participants, and others should not know to which group the participant will be assigned. Knowledge of group assignment creates a layer of potential selection bias that may taint the data, also added that the basic benefits of randomization are eliminates the selection bias, balances the groups with respect to many known and unknown confounding or prognostic variables, and forms the basis for statistical tests.

The finding of the current study illustrated that the highest percentage in the studied patients in both study and control group have unsatisfied total knowledge regarding breast cancer, lymphedema, self-care, post-surgery exercises during pre-implementation of nursing intervention program. The result of the study also indicated that there was no significant difference between study and control groups. This indicated proper randomization & matching between two groups in these variables .According to the opinion of the researcher, the level of knowledge was insufficient due to unavailability of training programs for patients, lack in continuous educations and most health care providers did not routinely counsel women or providing them with written information about breast surgery and self-care practice.

These explanations goes with **El-Araby et al., (2020)** who studied "Knowledge and Self Care Practices for Women with Breast Cancer Related Lymphedema" reported that the majority of the studied women had unsatisfactory knowledge about BC, BCRL and LE self-care practices. This could be interpreted by that, the lack of knowledge about BCRL among health care providers, as the physician and the nurse focused on providing brief guidelines just before discharge and most of nurses didn't have knowledge about LE and its prevention and management.

Theses explanations was in the same line with **Sayed et al., (2017)** who conducted " Informational Needs among Women with Newly Diagnosed Breast Cancer: Suggested Nursing Guidelines" showed that most of patients with breast cancer report having no knowledge about disease process or its complications, also supported that patients are in need for structured nursing guidelines to enhance their knowledge level.

The present study findings clarified that there was highly statistical significant difference among both study and control groups regarding total knowledge about breast cancer, lymphedema, self-care and post-surgery exercises. Among the control group there was no a statistical significant improvement in knowledge between pre and post implementation of designated nursing intervention program. However, among the study group there was highly a statistical significant improvement in knowledge between pre and post implementation of designated nursing intervention program. In the opinion of the researcher this improvement is due to health instructions given to study patients using different teaching strategies as lectures, discussion, and colored booklet. Also, the researcher emphasized the importance of the patient's knowledge.

This explanations comes in the same line with the study" Effect of nursing rehabilitation program on the prevention of LE among post mastectomy women "presented by **Hawash et al., (2018)** who reported that after implementing the nursing rehabilitation program, total knowledge improved among the studied women. Similar findings were revealed by studies done by **Shaikh and Bhore, (2021)** in the study entitled " Planned Teaching Regarding The Post Mastectomy Exercises On Knowledge Among The Women Undergoing Mastectomy In Selected Oncology Centers Of Sangli" pointed that overall women knew little or nothing about lymph edema before they developed it evidenced by pre knowledge test while, there was high statistical significant improvement in their knowledge in post-test.

The finding of the current study illustrated that the highest percentage in the studied patients in both study and control groups have unsatisfied total practice regarding operative exercises (first phase arm & hand) & (second phase shoulder and arm) pre-implementation of nursing intervention program which indicated proper matching between two groups in these variables. The result of the study also indicated that there was no significant difference between study and control group. According to the opinion of the researcher level of practice was insufficient due to in availability of training programs for patients during routine hospital care.

These explanations similar with **El-Araby et al., (2020)** who revealed that the majority of patients in both study and control groups had an inadequate level of practice before application of the educational nursing program. Also, **Soliman et al., (2018)** in the study "Effect of a planned Educational Program Regarding Post-Mastectomy Exercises on Living Activities among Breast Cancer Patients" supported this result as they demonstrated that the majority of the patients had in adequate self- care practices and arm exercises during the pre-study period.

The present study findings clarified that there was highly statistical significant difference among both study and control groups regarding total practice regarding operative exercises. Among the control group there was no a statistical significant improvement in knowledge between pre and post implementation of designated nursing intervention program however, among the study group there was highly a statistical significant improvement in knowledge between pre and post implementation of designated nursing intervention program. In researcher opinion it is due to studied patients were motivated to use and maintain arm and shoulder exercises through teaching the benefits of the exercises, which in turn, motivated them to apply and adhere to regular exercise, learning support by the researcher and effective learning materials (booklet, and poster), also family support while exercising all contributed on the patients to comply with the exercises program.

These explanations are agreed with **Mohammed et al., (2020)** who conducted the study "Effect of Educational Nursing Program on Performance and Self-efficacy of Females Undergoing Mastectomy "confirmed that patient training program post-mastectomy led to good adherence to self-care practices as arm care, arm exercise and improved quality of life score .Also, **Soliman et al., (2018)** who carried out the study "the Effect of a planned educational program regarding post mastectomy exercises on living activities among breast cancer patients" showed that there were statistically significant differences regarding the mean practice score at three different interval pre, post and follow up intervention regarding to post mastectomy exercises.

Results of the study clarified that there was no statistical significant difference in occurrence of lymphedema one month post implementation of designated nursing intervention program among both study and control groups. But, there was statistical significant difference in occurrence of lymphedema

three months post implementation of designated nursing intervention program among both study and control groups. the studied patient has a lower incidence of lympodema severity than in control group. According to researcher point of view these could be due to exercises and self-manual lymphedema drainage helping in reducing affected arm size, pain and improving self-care knowledge had significant relation to LE presence of the studied women.

This explanation agrees **Borman et al., (2017)** who reported that the educated patients have a delayed progression of LE and lower stages than patients lacking awareness of LE. Also, the educated patients shortly after their surgery had higher QOL scores indicating a non- impaired wellbeing. Also , result of a study about "Self-care practices, patient education in women with breast cancer-related lymphedema" Presented by **Deveci et al., (2021)** who stated that, women who participated in their study showed varying degrees of acceptance and adjustment to life with LE and this appears to directly impact their ability to self-management.

The result of this study pointed that total mean ± SD of upper arm function index has been decreased from one month to three months post implementation of designated nursing intervention program in study group while, mean ± SD of upper arm function index has been increased in study group has been decreased from one month to three months post implementation of designated nursing intervention program in control group with a lower mean statistical significant difference in total of upper arm function index score one & three months post implementation of designated nursing intervention program among both study and control group with p-value <0.001*.

According to researchers' opinion activities such as home or family duties, household, lifting and carrying opening, holding, pushing or pressing and transports they are necessary for usual daily life, also the studied women's desire to overcome the disease and their hope in living well to have the ability to care for their families. Moreover, these helps in following of LE self-care instructions, hand and arm exercises of designated nursing intervention that helping in reducing arm lymphedema and improving upper limb functional ability.

The study pointed that there was highly statistically significant relation between knowledge and practice pre and post implementation of designated nursing intervention program among study group, also there was statistical significant positive correlation between knowledge score, practice score and lymph edema incidence and upper arm function post implementation of designated nursing intervention program among study group.

These results were supported with the study about "The Effect of Health Literacy Counseling on Self-Care in Women after Mastectomy" by **Rastegar et al., (2020)** who mentioned that knowledge impacts ability to carry out self-management activity and a lack of knowledge about the mechanism of treatment and expected outcomes will inevitably affect perceived benefit of treatment. Also, these results are in agreement with the study about "Reducing breast cancer related lymphedema through prospective surveillance monitoring using bio impedance spectroscopy and patient directed self- interventions" by **Kilgore et al., (2018)** who stated that self-directed intervention is more convenient for the patient with LE and results in improved compliance. Also, in consistent with **Hashem et al., (2020)** who mentioned that patient education reduces BCRL risk and associated symptoms.

So, the planning and implementation of designated nursing intervention program for post breast cancer surgery patients and providing them with tailored information can improve patient's knowledge& practices also, decrease severity of Lymphedema, increase arm functional abilities which support the current study hypothesis.

6. CONCLUSION

Based on the findings of the study, it can be concluded that, designated nursing intervention program had a positive effect on the outcomes of patients as regarding knowledge, practices, incidence of lymphedema and upper arm function disabilities.

7. RECOMMENDATIONS FOR FURTHER RESEARCHES

•Replication of the study on a larger sample and on different geographical settings to allow generalization of findings.

•Increased awareness of nurses on the positive effect of the early exercises in the prevention of lymphedema of the arm.

•Emphasize on the importance of the role of health professionals in the correct assessment of patients' situations and in the provision of explicit and relevant information, therefore more time should be devoted to transmitting information on postoperative care to patients.

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