Nurse Led Pre-Operative Education Regarding Post Mastectomy Exercise: Effect On Pain And Range Of Motion Of The Affected Arm

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Abstract

Background:

Post mastectomy exercise plays an important role in prevention of complications after mastectomy surgery. Nurse led preoperative education regarding post mastectomy exercise prepares the woman psychologically to face the post-operative period with more confidence. The study aimed to assess the effect of nurse led pre-operative education regarding post mastectomy exercise on pain and range of motion of the affected arm among women undergoing mastectomy.

Materials and methods:

Post-test only control group design was used. 30 women undergoing mastectomy were selected by purposive sampling. The control group was given routine treatment. The experimental group was taught post mastectomy exercise pre-operatively. The patient was instructed to perform the post mastectomy exercises from the second post-operative day for 30 minutes thrice in a day for seven days. Post-test was done on 3rd and 7th day post-operative day. Pain was assessed using numerical rating scale and range of motion was measured using Goniometer.

Results:

The 't' value for pain among control and experimental group on 3rd day was 0.4332 and on 7th day was 5.1183 at p=0.05. Regarding range of motion, on 3rd day the 't' value of shoulder flexion was 0.7577, internal rotation was 0.6702, external rotation was 0.00092 and on 7th day shoulder flexion was 4.8664, internal rotation was 2.8331 and external rotation was 4.2162 at p=0.05. The finding showed that there was significant difference in the pain score and range of motion among the control and experimental group.

Conclusion:

The nurse led pre-operative education regarding post mastectomy exercise prepares patients to face post-operative period confidently and also effective in reducing the pain and improving the range of motion.

Keywords: Nurse led pre-operative education, post mastectomy exercise, range of motion

Introduction

The word cancer is derived from the Greek word "canker" which means crab. Like crab it invades the body tissue and destroys the normal cells. Cancer is one of the leading causes of death in India, with about 2.5 million cancer patients, 1 million new cases added every year. According to GLOBOCAN, cancer mortality and morbidity are increasing worldwide, with an estimated 13.1 million deaths in 2030 [1].

Breast cancer is one of the most common cancers diagnosed in women and perceived as a fatal problem. It is also the principal cause of death from

1216

cancer among women globally. Despite the high incidence rates, in western countries, 89% of women diagnosed with breast cancer are still alive 5 years after their diagnosis which is due to early detection and treatment. The various modes of cancer treatments are surgery, radiotherapy and chemotherapy. The goal is to cure the disease or considerably prolong life while improving the patient's quality of life (WHO, 2020). Statistical analysis of breast cancer in India (2019) shows a breast cancer prevalence rate of 25.8 women per 100000 women in India. As per the registry, Tamil Nadu has around 10,269 breast cancer cases in 2018 [2].

Ivana Leao Ribeiro , et al ., (2019) had conducted a study to evaluate the effectiveness of early rehabilitation on arm range of motion (ROM), strength and function after breast cancer surgery (BCS). A total of 1710 patients were evaluated. The study concluded that both ROM and strengthening exercises associated with ROM exercises improved shoulder flexion, abduction and external rotation after BCS. Shoulder abduction and external rotation showed less recovery, irrespective of the intervention applied [3].

Maria de Lourdes., (2019) had conducted a study to assess the range of motion and upper limb function postoperatively before and after physiotherapy intervention of women who underwent mastectomy. This is an interventional study, descriptive, exploratory and quantitative approach, with 64 women undergoing conservative surgery and mastectomy with follow up at the gynecology outpatient clinic and referred for physical therapy. The study concluded that physiotherapeutic intervention provided a significant improvement in the range of motion [4].

Hyang Sook So et al ., (2006) had conducted a study to assess the effectiveness of aerobic exercise using a flex band on the improvement of physical functions and body image in breast cancer women undergone mastectomy. In this study 26 women were selected among them 15 were in experimental group and 11 were in control group. The experimental group participated in an aerobic exercise program for 3 times a week, for 6 weeks and the control group received no exercise treatment during the research period. The study concluded that the experimental group women had significantly more improved cardiopulmonary functions, range of motion of the affected shoulder joint, and body image compared to the control group [5].

Surgery is the most common treatment for breast cancer. Studies done by the researchers reported that post mastectomy exercises reduce pain and improve range of motion of the affected arm during immediate post-operative period. Presently most of the women doesn't aware about post mastectomy exercise even though it has more benefits. So, the investigator planned to construct a nurse led education regarding post mastectomy exercise for the women undergoing mastectomy and assess the effectiveness in achieving the desired goal of educating about post mastectomy exercise. The aim of this study is to assess the effect of nurse led pre-operative education regarding post mastectomy exercise on pain and range of motion of the affected arm among women undergoing mastectomy.

Hypotheses

H1-There will be a significant difference between the post-test level of pain and range of motion of the affected arm among women undergoing mastectomy in control and experimental group.

H2 –There will be a significant association between demographic variables with the post-test level of pain and range of motion of the affected arm among women undergoing mastectomy in control and experimental group.

Materials And Methods

Research Approach:

The research approach selected to accomplish the objectives of the study was quantitative approach.

Research Design:

Post-test only control group design was used to assess the effect of nurse led pre-operative education regarding post mastectomy exercise on pain and range of motion of the affected arm among patients undergoing mastectomy.
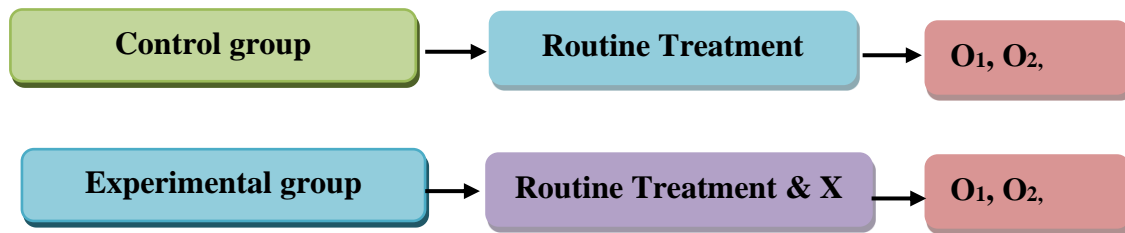
Figure 1

X - Nurse led pre-operative education regarding post mastectomy exercise

O_1, O_2, - Post-test observation at two points in both groups (3rd & 7th day)

Setting Of The Study:

This study was conducted in C.S.I. Kanyakumari Medical Mission Hospital, Neyyoor.

Population:

The population of this study was women who were undergoing mastectomy surgery in C.S.I. Kanyakumari Medical Mission Hospital, Neyyoor.

Sample:

In this study, sample consisted of woman undergoing mastectomy and fulfilling the inclusion criteria.

Sample Size:

The sample size was 30 women undergoing mastectomy (15 in control group and 15 in experimental group).

Sampling Technique:

Purposive sampling technique was used to select the samples among women who were undergoing mastectomy.

Data Collection Tool Used:

The tools for data collection had two parts

Part-I:

This section dealt with the demographic variables such as age, marital status, educational status, occupation, nature of work, family income, type of family and co- morbid illness. It also consisted of clinical variables such as age at menarche, menstrual history, obstetrical history, feeding history, any abnormal changes in breast and age at menopause.

Part –II:

Assessment Of Pain

The pain was assessed by using Numerical Rating Scale.

The scoring was interpreted as follow

0 - No pain

1-3 - Mild pain

4-7 - Moderate pain

8-10 - Severe pain

Assessment Of Range Of Motion Of Arm

The device goniometer was used to measure the range of motion in shoulder. Expected range of motion in shoulder based on Elvaru - STJ Range of Motion position and Range of Motion reliability

The normal level of Range of Motion as follow:

1. Shoulder Flexion: 120°
2. Shoulder Abduction: 90°
3. Shoulder Internal and External Rotation: 70° internal rotation; 90°external rotation.
4. Shoulder Horizontal Abduction: 45°

Validity And Reliability:

The content was validated by 5 experts from the field of Oncology, Nursing and Statistical field. The inter-rater reliability was used to assess the pain and to measure the range of motion. The reliability was r=0.8. Hence the tools were found to be reliable.

Ethical Consideration:

The study was conducted after getting approval from the research committee of Christian College of Nursing, Neyyoor. A formal permission was obtained from Medical Superintendent of CSI Kanniyakumari Medical Mission Hospital, Neyyoor. The oral consent

was taken from the samples. The usual assurance of anonymity and confidentiality was maintained.

Data Collection Procedure:

The data collection was done for 6 weeks in three phases.

Phase I:

The investigator introduced herself to the patient and explained the purpose of the study to ensure better co-operation. Oral consent was obtained from each patient before starting data collection. Then demographic variables and clinical variables were collected from the patient pre operatively with the help of questionnaires.

Phase II:

Control Group: The control group received the routine treatment practiced in the hospital.

Experimental Group: During pre-operative period, the experimental group was given nurse led education regarding post mastectomy exercise along with routine treatment. Individualized teaching was given regarding post mastectomy exercise for 20 minutes. The investigator demonstrated the post mastectomy exercise and supervised the re-demonstration done by the women undergoing mastectomy. The patient was instructed to perform the post mastectomy exercise from the second post-operative day for 30 minutes thrice in a day (morning, afternoon & evening) for seven days.

Phase III:

The post test was done on the third and seventh postoperative day by using same tool.

Results

Demographic Variables:

Majority (46.7%) in both groups were within the age group of 36 to 45 years. Most of them (73.4%) in control group and (86.8%) in experimental group were married. Nearly (40%) in control group and (46.7%) in experimental group were graduated. Majority (80%) in control group and (73.3%) in experimental group were from rural places. Most of them (53.3%) in control group and (33.3%) in experimental group were housewives. All of them (100%) in both groups had moderate level of work. About (66.67%) in both groups has no comorbid

illness. Majority (80%) in control group and (73.3%) in experimental group has no family history of breast cancer.

Clinical Variables:

Most of them (53.3%) in control group and (66.7%) in experimental group attained their menarche in between 13 and 15 years. Almost (73.3%) in control group and (80%) in experimental group has regular menstrual cycle. Nearly (60%) in both groups had two deliveries. Majority (66.67%) in both groups conceived their first child between 21 to 25 years of age. All of them (100%) in both groups breast fed their children. All of them (100%) in both groups do not have any breast engorgement during feeding. All of them (100%) in both groups didn't have any lumps in the breast. All of them (100%) in both groups didn't use any oral contraceptive pills. Nearly (26.7%) in control group and (20%) in experimental group attained menopause

Comparison of level of pain and range of motion on 3rd and 7th day:

Level Of Pain On 3rd And 7th Day:

On 3rd day the mean pain score level in control group was 8.92 and in experimental group was 8.71 with standard deviation of 0.07 and 0.22. The 't' value was 0.4332 which was lower than the table value at 0.05 level of significance (Table 1). On 7th day the mean pain score level in control group was 5.71 and in experimental group was 4.28 with the standard deviation of 0.22 and 0.53. The 't' value of pain was 5.1183 which was higher than the table value at 0.05 level of significance (Table 2, Fig 2). On 3rd and 7th day the F value for level of pain was 281.254 with P value 4.13 which was higher than the table value at 0.05 level of significance (Table 3). These findings reveal that nurse led pre-operative education regarding post mastectomy exercise is effective in reducing pain and improving range of motion of the affected arm among women undergoing mastectomy.

Range Of Motion:

On 3rd day the mean score for shoulder flexion in control group was 47.86 and in experimental group was 46.78 with the standard deviation of 6.42 and 5.04. The mean score for internal rotation on 3rd day in control group was 24.64 and in experimental group was 24.64 with the standard deviation of 63.65 and

Page 1219

4.14. The mean score for external rotation on 3rd day in control group was 24.28 and in experimental group was 28.93 with the standard deviation of 3.85 and 4.01. The 't' value of shoulder flexion (0.7577), shoulder abduction (0.3008), internal rotation (0.6702), external rotation (0.00092) and shoulder horizontal abduction (1) which was lower than the table value at 0.05 level of significance. (Table 1)

On 7th day the mean score for shoulder flexion in control group was 70 and in experimental group was 92.5 with the standard deviation of 3.92 and 6.12. The mean score for internal rotation on 7th day in control group was 52.86 and in experimental group was 43.21 with the standard deviation of 4.67 and 4.21. The mean score for external rotation on 7th day in control group was 61.43 and in experimental group was 52.14 with the standard deviation of 5.69 and 3.78. The 't' value of shoulder flexion (4.8664), internal rotation (2.8331) and external rotation (4.2162) which was higher than the table value at 0.05 level of significance. (Table 2, Fig3,4)

On 3rd and 7th day the F value for shoulder flexion was 219.436 with P value 1.69 which was higher than the table value at 0.05 level of significance. The F value for shoulder abduction was 123.892 with P value 1.13 which was higher than the table value at 0.05 level of significance. The F value for internal rotation was 157.891 with P value 4.19 which was higher than the table value at 0.05 level of significance. The F value for external rotation was 232.013 with P value 4.42 which was higher than the table value at 0.05 level of significance. The F value for shoulder horizontal abduction was 117.959 with P value 3.43 which was higher than the table value at 0.05 level of significance. (Table 3). These findings reveals that nurse led pre-operative education regarding post mastectomy exercise is effective in reducing pain and improving range of motion of the affected arm among women undergoing mastectomy.

Figure 2: Assessment of pain among women undergoing mastectomy on 3rd and 7th day in control group and experimental group (N=30)
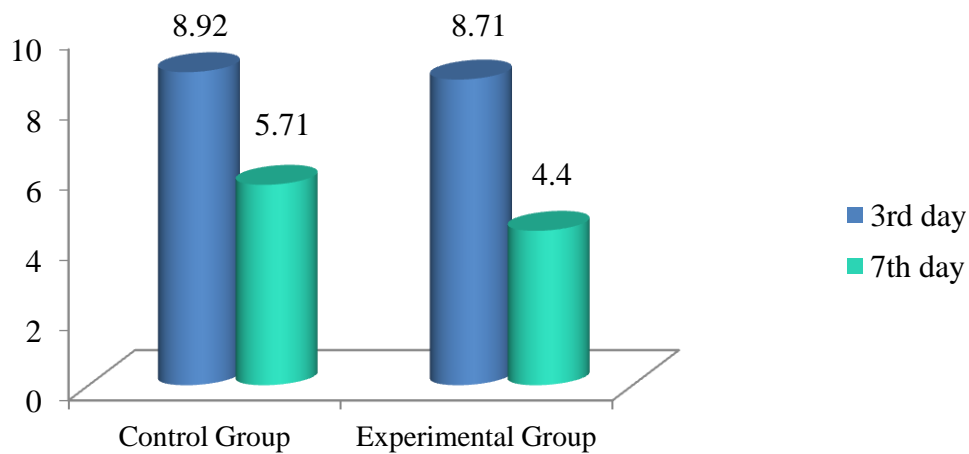
Figure 3: Assessment of Shoulder Flexion among women undergoing mastectomy on 3rd and 7th day in control group and experimental group (N=30)
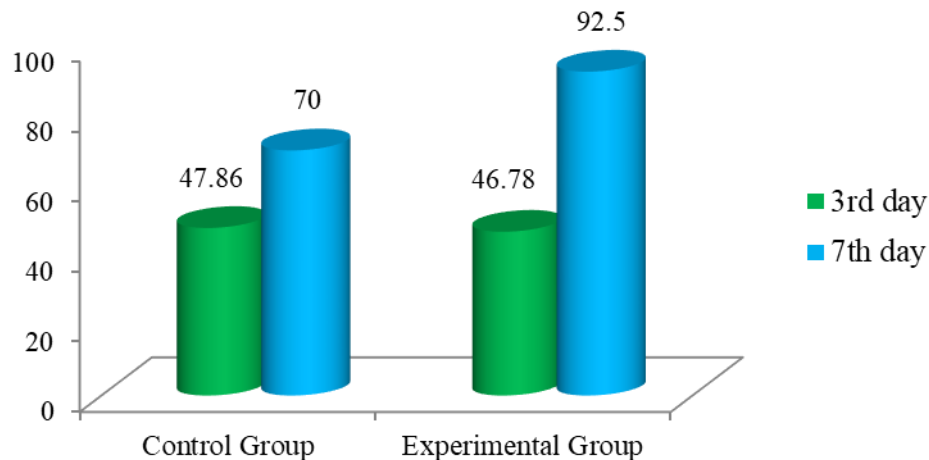

Figure 4: Assessment of External Rotation among women undergoing mastectomy on 3rd and 7th day in control group and experimental group (N=30)
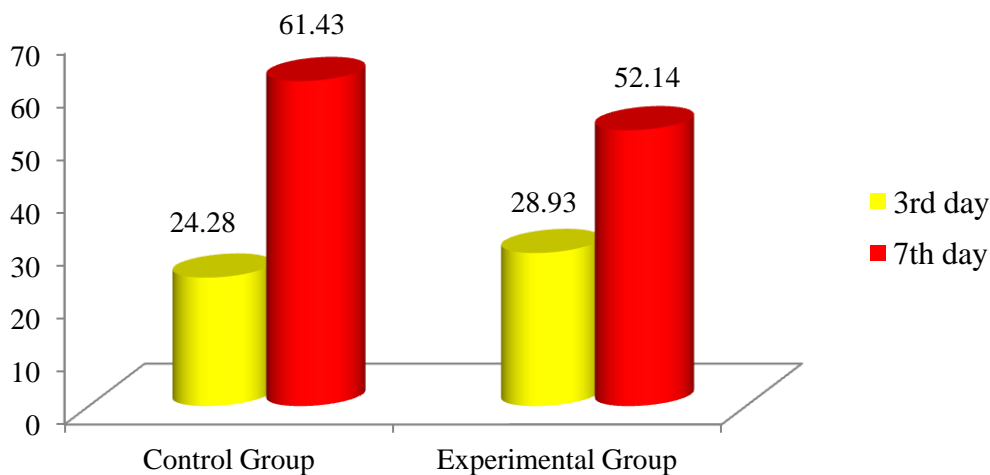

Table 1: Comparison of control group and experimental group of women undergoing mastectomy regarding pain and range of motion on 3rd day

S.No	Variables	Group	Score	Mean	SD	t	Table value
			Min Max				
1	Pain	Control	0 10	8.92	0.07		

						0.4332	2.13
		Experimental	0 10	8.71	0.22		
2	Shoulder	Control	0 120	47.86	6.42		
	Flexion					0.7577	2.13
		Experimental	0 120	46.78	5.04		
3	Shoulder	Control	0 90	35	3.39		
	Abduction					0.3008	2.13
		Experimental	0 90	33.93	4.01		
4	Internal	Control	0 70	24.64	3.65		
	Rotation					0.6702	2.13
		Experimental	0 70	24.64	4.14		
5	External	Control	0 90	24.28	3.85		
	Rotation					0.00092	2.13
		Experimental	0 90	28.93	4.01		

Table 2: Comparison of control group and experimental group of women undergoing mastectomy regarding pain and range of motion on 7th day

S.No	Variables	Group	Score	Mean	SD	t value	Table value
			Min Max				
1	Pain	Control	0 10	5.71	0.22		
						5.1183*	2.13
		Experimental	0 10	4.28	0.53		
2	Shoulder	Control	0 120	70	3.92		
	Flexion					4.8664*	2.13
		Experimental	0 120	92.5	6.12		
3	Shoulder	Control	0 90	52.86	3.23		
	Abduction					0.00058	2.13
		Experimental	0 90	60.71	6.46		
4	Internal	Control	0 70	52.86	4.67		
	Rotation					2.8331*	2.13

		Experimental	0 70	43.21	4.21		
5	External	Control	0 90	61.43	5.69		
	Rotation					4.2162*	2.13
		Experimental	0 90	52.14	3.78		
6	Shoulder	Control	0 45	30.56	3.65		
	Horizontal					1.3889	2.13
	Abduction						
		Experimental	0 45	22.5	2.59		

Table 3: Comparison of control and experimental group of women undergoing mastectomy regarding level of pain and range of motion on 3rd and 7th day

S.No	Variables	Group	Mean	F	P
			3rd Day 7th Day		
1	Pain	Control	8.92 5.71		
				281.254	4.13*

		Experimental	8.71 4.28		
2	Shoulder	Control	47.86 70		
	Flexion			219.436	1.69*
		Experimental	46.78 92.5		
3	Shoulder	Control	35 52.86		
	Abduction			123.892	1.13*
		Experimental	33.93 60.71		
4	Internal	Control	24.64 52.86		
	Rotation			157.891	4.19*
		Experimental	24.64 43.21		
5	External	Control	24.28 61.43		
	Rotation			232.013	4.42*
		Experimental	28.93 52.14		
6	Shoulder	Control	13.57 30.56		
	Horizontal			117.959	3.43*
	Abduction	Experimental	13.57 22.5		

Discussion

The study findings were supported by the study done by Cristina. A. P, (2007) described that physical therapy focusing on mobility, strength and scar massage reduced shoulder pain and weakness when compared to women who were given only written suggestions for arm and shoulder exercises.

The study findings was supported by the study done by Salwa . A (2016) which described that there was a highly significant difference in patients level of pain intensity, shoulder movement and functional status of the study group as compared to the control group ($p < 0.05$). Thus, the educational program had positive effect in reducing patients' pain, improve shoulder movement.

The study findings is supported by the study done by Akbas .A (2021) which described that there is no relationship between the development of limited shoulder ROM and the type of surgery. In addition, there was no significant association between shoulder ROM and use of RT, side of the surgery, and demographic features of the patients.

The present study revealed that when the exercise is taught in the pre-operative period, the patients are prepared psychologically to perform the exercise during the early post-operative period. This reduces pain and improves range of motion of the shoulder in experimental group. On the third day there was no much difference in the pain and range of motion (i.e., 3rd day). But on 7th day there is difference in the pain and range of motion. This shows that, if the patient starts the post-operative exercise early and continues to do, the pain will reduce and improves range of motion. These findings reveal that nurse led pre-operative education regarding post mastectomy exercise is effective in reducing pain and improving range of motion of the affected arm among women undergoing mastectomy.

Limitations

The study sample size was small and samples were selected by purposive sampling method. Additional information sharing tools such as information booklet would have enhanced the result.

Conclusion:

The study results concluded that the nurse led pre-operative education regarding post mastectomy exercise was effective in reducing the level of pain and improving the range of motion of women undergoing mastectomy. The present study revealed that when the exercise is taught in the pre-operative period, the patients are prepared psychologically to start performing the exercise during the early post-operative period. This reduces pain and improves range of motion of the shoulder in experimental group.

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