



## Original Article

## Comparative Effects of Pre-Operative Versus Post-Operative Shoulder Rehabilitation Program Mastectomy Patients: A Cross-Sectional Survey

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## ABSTRACT

Breast cancer is ranked the top in types of cancer that affects internationally. It affects up to 1 in 13 women during their lifetime. Physiotherapy is one of the major sources of recovery in patients of Mastectomy in terms of pain, ranges, and function. **Objective:** To compare the effects of pre-operative shoulder rehabilitation program versus post-operative mastectomy patients. **Methods:** It was a randomized clinical trial. The study setting was Oncology Department, Mayo Hospital Lahore, Shaukat Khanum Memorial Hospital and Gulab Devi Hospital Lahore. The study was completed in 6 months. Total 50 subjects were allocated in two groups using lottery method of randomization. Patient with age less than 40 years, diagnosed with breast cancer were included, while those with associated signs of musculoskeletal problems, autoimmune systemic disease and advanced medical problem was excluded. Group A received set of exercises comprised of range of motion exercises and lymph edema education pre and post operatively. Group B received post rehabilitation exercises only. Data was analyzed by SPSS 20.0. Independent *t*-test was applied to analyze between group differences and paired sample *t*-test to see within group improvement. Descriptive statistics was in form of mean, variance and appropriate graphs. **Results:** Independent sample test results regarding post interventional disability of arm, shoulder, and hand (DASH) score showed significant *p* value 0.000 with a mean difference of 23.28000 while assuming equal variances. The mean and standard deviation of pain score was 3.76 (SD+0.778) pre/post combination group and post-operative rehabilitation program alone 4.1200 (SD+0.78102) with a statistically equal improvement in both groups (0.109). **Conclusions:** The study concluded that there was significant difference with better outcomes in terms of improvement in function, pain and range in patients having combination protocol *i.e.* pre-operative and post-operative rehab protocol in patient of mastectomy as compared to post-operative rehabilitation protocol alone.

## INTRODUCTION

Breast cancer (BC) was the most recognized cancer among females in the West world also, and its origin explained genetic, reproductive, hormonal, and exogenous reasons. The term "breast cancer" in accordance with a malignancy that advanced from unusual expansion of cells in the breast. BC was perpetually caused by a genetic anomaly. Although only 5-10% of cancers were due to an abnormality inherited from mother or father. Rather, 85-90% of BCs were due to genetic abnormalities [1]. It has an increased

incidence by early menarche, late menopause, and fatness in postmenopausal females. Risk factors that formulate the development of BC were mostly: age, geographical areas and socioeconomic status, reproductive cycles, external hormones, lifestyle risk factors, family history of BC, ionizing radiation, bone density, height and chemopreventive agents [2,3]. The treatment of choice for BC of any size or type was radical mastectomy no matter of the patient's age was 80 years. Functional status of the upper

limb was very important in BCs management [4,5]. The reduced shoulder range of motion and function had been assigned as a challenge after BC surgery for many years. Physiotherapy is prescribed, as per the specialists' inclinations for post-agent care, to enhance the physical recuperation of mastectomy patients, by giving fitting activity solution, and aid the training of patients to encourage their: Recovery of shoulder range of movement (ROM) and physical capacity of the worked arm; Awareness of lymphedema, its aversion and early detection [6,7]. In recent studies, patients with mastectomy with axillary node dissection showed multiple post-operative effects on swelling, mobility, strength, pain, and stiffness of the shoulder joint. Overall, 45% patients come with these impairments after a year. 16% with pain and 16% with reduced strength while lymph edema increasing progressively, so it is estimated that designing a standardized physical therapy treatment including shoulder range of motion exercises after axillary dissection in BC is necessary [8,9]. The previous research tells us about the use of physical therapy program and explains that start of physiotherapy after surgery has the power for short-term functional, physical and health-related quality of life advancements and improving the psychosocial status of patients [10]. In other studies, 65 women sample were randomly collected for the treatment group and data were completed before surgery at day 5 and at 1 month and this study examined the related changes in shoulder functional movements after surgery for BC to describe the effect of elective physiotherapy interventional technique [11,12]. Hence, functional movement recovery at 1 month was more in patients with physical therapy shoulder rehabilitation, also, the use of physical therapy program and explains that start of physiotherapy after surgery has the power for short-term functional, physical and health-related quality of life advancements [13,14]. Therefore, the objective was to measure the effectiveness of pre-operative shoulder rehabilitation program in post-operative mastectomy patients.

## METHODS

This study compared the effectiveness of pre-operative shoulder rehabilitation program in post-operative mastectomy patients and patients were assigned into two groups on randomized basis. Data was collected from Oncology Department of Mayo Hospital, Shaukat Khanum and Gulab Devi Hospital. Simple randomized sampling technique; lottery method was used. It was performed using fifty numbered cards, folded and placed in a box. Group A was assigned to the cards labeled as 1-25, owed to receive treatment before mastectomy. Group B assign to patients with draw result showed number between 25 to 50 and decide to receive no treatment before mastectomy. At

each subject randomization time-point, to assure randomization, folded cards were thoroughly mixed together. The randomization procedure is often replaced by computer techniques, but manual randomization is suitable for samples of  $N \leq 60$  ( $n \leq 30$  per group). Patients with age  $\geq 40$  year diagnosed of breast cancer with stage 2 or above 2 and pre-operative patients were eligible for this trial while patients having any sign of systemic disease or neurological disorders and associated with other musculoskeletal problems (Acute traumatic ligamentous instability) were excluded. Recruitment was done through informatory leaflets placed at clinics in oncology practitioners, physiotherapy clinics, local pharmacies, and word of mouth. Participants meeting all-inclusive and exclusive criteria was randomly placed into one of 2 groups with 25 patients in each (Group A and B). Participants also informed about the aim of this study. Group A was given basic protocols before mastectomy including Assessment – shoulder ROM, functional questionnaire, limb size. Group B was given no exercises before mastectomy and after the Exercises which will be done are post-operative presentation ROM Exercises, preliminary lymphedema education [15]. No restrictions were forced on either assemble as to changing activity propensities or searching out other treatment amid the review time frame.

## RESULTS

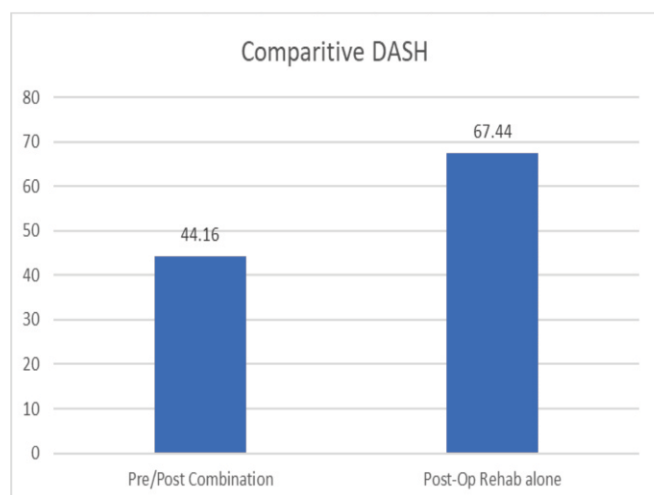
Independent sample test results regarding post interventional disability of arm, shoulder, and hand (DASH) score showed significant p value 0.000 with mean difference 23.28000 and 48 degree of freedom among equal variances assumed was found. Group statistics regarding numeric rating pain scale of interventional group at the level of combination of pre/post interventional program showed mean value 7.5600 (SD+0.50662), at level of post-operative rehabilitation program alone mean value 7.2800 (SD+0.45826) and post interventional numeric rating pain scale at the level of combination of pre/post interventional program showed mean value 3.7600 (SD+0.77889) and at the level of post-operative rehabilitation program alone showed mean value 4.1200 (SD+0.78102).

| Scales  | Intervention Group   | Mean   | SD     | Sig. (2-tailed) |
|---|----------------------|--------|--------|-----------------|
| Numeric Rating Pain Scale                     | Pre/Post Combination | 7.5600 | .50662 | 0-46            |
|   | Post-Op Rehab alone  | 7.2800 | .45826 |                 |
| Post Interventional Numeric Rating Pain Scale | Pre/Post Combination | 3.7600 | .77889 | .109            |
|   | Post-Op Rehab alone  | 4.1200 | .78102 |                 |

**Table 1:** Comparative Intensity of Pain

| Ranges of Shoulder                             | Intervention Group   | Mean     | SD       | Sig. (2-tailed) |
|--|----------------------|----------|----------|-----------------|
| Shoulder Range of Flexion: Pre-Intervention    | Pre/Post Combination | 90.9200  | 20.68196 | .668            |
|  | Post-Op Rehab alone  | 93.7600  | 25.59505 | .668            |
| Shoulder Range of Flexion: Post Intervention   | Pre/Post Combination | 80.9200  | 24.84271 | .011            |
|  | Post-Op Rehab alone  | 98.6000  | 22.34017 | .011            |
| Shoulder Range of Extension: Pre-Intervention  | Pre/Post Combination | 24.0400  | 3.49380  | .255            |
|  | Post-Op Rehab alone  | 25.0800  | 2.85657  | .255            |
| Shoulder Range of Extension: Post Intervention | Pre/Post Combination | 32.1200  | 1.90000  | .000            |
|  | Post-Op Rehab alone  | 29.0400  | 2.42350  | .000            |
| Shoulder Range of Abduction: Pre-Intervention  | Pre/Post Combination | 62.8800  | 15.60534 | .732            |
|  | Post-Op Rehab alone  | 61.4800  | 13.00359 | .732            |
| Shoulder Range of Abduction: Post Intervention | Pre/Post Combination | 117.8800 | 24.00229 | .000            |
|  | Post-Op Rehab alone  | 86.2800  | 15.93874 | .000            |

**Table 2:** Comparative Ranges of Shoulder



**Figure 1:** Comparative DASH Score

The study concluded that there was significant difference with better outcomes in terms of improvement in function, pain and range in patients having combination protocol i.e. pre-operative and post-operative rehab protocol in patient of mastectomy as compared to post-operative rehabilitation protocol alone.

## DISCUSSION

Although the findings revealed that patients with mastectomy had significant improvements on reducing pain and regain mobility after having pre-operative shoulder rehabilitation protocols. Disability measured with arm should disability scale was profound right after mastectomy for both groups, however, it improved for significantly for patients who have taken pre-operative protocol for shoulder hand complications [2,16,17]. However, improvement in patients of only receiving post-operative rehabilitation protocol was also significant when compared at right after mastectomy level of measurement.

Studies showed that the mean age was middle age showed most population at or near menopause phase. This sort of age also shows a well-built commitment with trial [4,18]. Other measurements such as pain on numeric rating pain scale was similar to that of disability index findings except that the difference was not steep, furthermore, the drop in pain was equal for both groups i.e. there was not a significant difference between both aforementioned groups but there was difference in pre and post testing level [16,19,20]. According to the facts and figures housewives and the people belong to rural areas are much more effected than others who are related to some different type of profession and urban backgrounds. Even some recent studies suggest that the people with decreased or low level of education about physiotherapy and low level of activity were more prone to such type of chronic issues which become injurious to health at the end [20,21].

## CONCLUSIONS

The study concluded that there was a significant difference with better outcomes in terms of improvement in function, pain and range in patients having combination protocol i.e. pre-operative and post-operative rehab protocol in patient of mastectomy as compared to post-operative rehabilitation protocol alone.

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