Effect of Graded Repetitive Arm Supplementary Program in Improving Upper Extremity Function and Self-Efficacy among Women with Post-Operative Breast Cancer

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Abstract

Aims and Objectives: The study aimed to find the effect of graded repetitive arm supplementary program in improving upper extremity function and self-efficacy among women with post-operative breast cancer. **Methods:** Thirty women between the ages of 30-55 years who were already diagnosed with breast cancer were selected and participated in this study. The participants were divided into 2 groups, each 15 in experimental and control group. DASH scale was used to find out the level of upper extremity function and GSE to find out the level of self-efficacy was used. The experimental group underwent graded repetitive arm supplementary program, whereas the control group attended conventional occupational therapy for 3 months. The SPSS software version was used for data analysis. **Result:** The data analyzed the pretest and post test score of both experimental and control group which shows a significant difference between 2 groups. **Conclusion:** This study concluded that graded repetitive arm supplementary program has proved its effect in improving upper extremity function among women with post-operative breast cancer.

Keywords: Graded repetitive arm supplementary program, upper extremity function, self-efficacy, breast cancer

Introduction

Breast cancer is a disease in which abnormal breast cells grow out of control and form tumors. Breast cancer cells begin inside the milk ducts and/ or the milk producing lobules of the breast. The earliest form is not life- threatening and can be detected in early stages. Cancer cells can spread into nearby tissue (invasion). This

creates tumors that cause lumps or thickening. Invasive cancer can spread to nearby lymph nodes or other organs (metastasizes). Metastasis can be life threatening and fatal.[1]

Breast cancer is the most common cancer in women, with over 2 million new cases each year, and its incidence and mortality Rates rank first and second globally, respectively. Breast cancer .Survival rates have increased in the last 4 decades because of Enhanced screening and awareness efforts. Furthermore, innovative and individualized therapy procedures have aided in the Improvement of overall survival.[2]

Unfortunately, surviving cancer patients undergoing cancer treatment experience a slew of side effects, including pain, Weakness, fatigue, lymphedema, sexual health and fertility Issues, nausea, vomiting, anxiety, depression, and poor physical Health, all of which have a negative impact on their activities of daily living and quality of life. These constraints also result in cancer related Impairment, which puts patients at a greater risk of long-term Disability, hospitalization, and overall death.[3]

Occupational therapy (OT) is an essential component of rehabilitation treatment, as it aids in improving the physical and mental capabilities, self-care abilities, work and learning abilities, and social reintegration of rehabilitation patients. OT is centered on patients, and it improves their physical, psychological, and social functions, promotes activity and participation, and improves their QoL through selected occupational activities or appropriate environmental interventions.[4]

Occupational therapists rely on their general knowledge and expertise related to intervention for patient with physical dysfunction in treating patient with cancer. The areas of intervention that exemplify cancer-specific intervention that are within occupational therapists scope of practice. That includes: Arm function an occupational therapy program for women with cancer related lymphedema that incorporated exercise and education was found to result improvements in upper extremity swelling, arm flexibility, and mood Breast cancer recovery program (BCRP) for lymphedema.[5] Address activity limitation therapist provides intervention to reduce activity limitation by providing ADL, IADL, and transfer training to person with cancer.[6]

Grasp is a new technique and it is inexpensive and practical to provide large number of intervention with an aim on meaningful skills in the upper extremity. GRASP is a self - directed protocol of the handand arm. It is taught and supervised by the therapist, this encourage the individual to perform independently. This protocol initially was formed and programmed for the improvement of arm and hand function in the post stroke people. This supplementary upper extremity program has many benefits.[7] Since the GRASP techniques has been used for different condition to improve the upper extremity, researchers could not find any studies finding the effectiveness of GRASP protocol among women with breast cancer. Hence this study has

been done to find out the effect of graded repetitive arm supplementary program on improving upper extremity function and self-efficacy among women with post-operative breast cancer.

Meterials and Methods

Study design: This study is a quantitative quasi experimental research design with convenient sampling Technique. A total of 30 subjects were selected and divided into two groups 15 in the control group 15 in the experimental group. Samples were collected in Saveetha medical college, Chennai.

Participants

Participants were selected according to the inclusion and exclusion criteria. Inclusion criteria includes Women diagnosed with breast cancer, People aged between 30 to 55, only female patients, patients who score between 61-100 in DASH scale and score between 10-20 in GSE scale were included. Persons diagnosed withother cancers, people aged below 30 and above 55, and patients with other conditions with upper extremity functional difficulty were excluded. Participants were asked to give their written consent to participate in this study.

Outcome measures:

Dash

Disability of arm, shoulder and hand (DASH) and generalized self-efficacy (GSE)was used in this study. The DASH is a self-report 30 items questionnaire that looks ability of a patient to perform certain upper extremity activities. The DASH is a 5 point LIKERT scale from 0-20(minimal disability) to 81-100 (extreme disability). 0 is the minimum score, and 100 is the maximum score. Scores of 0-20 indicate minimal disability, 21-40 indicate mild disability, 41-60 indicate moderate disability, 61-80 indicate severe disability, and 81-100 indicates extreme disability.

GSE

The GSE scale is self-report 10 item questionnaire measures of self-efficacy. The total score is calculated by finding the sum of all the items, ranges between 10 and 40, with the higher score indicating more self-efficacy. The reliability and validity of the scale are as follows. The reliability of the DASH was excellent (interclass correlation coefficient 0.97).Internal consistency was strong (Cronbach's alpha 0.97). Validity was proven with excellent results for Pearson correlation with the relevant domains of the questionnaires: HAQ, r = 0.88; SF-36, r = 0.70; and AIMS2, r = 0.85. The clinical scores had a relatively low correlation with the DASH (DAS28, r = 0.42; and grip strength, r = 0.41-0.48), except for the VAS (r = 0.60-0.65).

Intervention Protocol

The post-mastectomy surgery patients were screened with the Disabilities of arm, shoulder and hand (DASH) scale. Informed consent from the respective patients was obtained before the intervention. The Disabilities of arm, shoulder and hand (DASH) scale was administered for pre-test. The control group underwent conventional occupational therapy intervention were as the experimental group underwent Graded repetitive arm supplementary program. With GRASP the individual are given a booklet of exercises that contains a progression of exercise repetition that they can proceed with encouraging them use their affected arm. The activities in the graded repetitive arm supplementary program were given to the patients for 3 months 3session per week for 30 minutes with 60seconds intervals. The disabilities of Arm, Shoulder and Hand (DASH) scale was administered as a post-test to evaluate the effect of the difficulties in the post mastectomy patients.

Statistical Method

A quasi experimental study was carried out by the analysis of inferential statistics in this study. Mean and Standard deviation (Minimum-Maximum) were used as a measurement criterion on a repeated basis for the result. The analyzed data was used by SPSS software version 23. The descriptive statistics examined records distribution to summarize the data. The results were measured and categorized in number (%). Significant figures Since the samples belonged to the sample size (20), non – parametric method was used to test the statistical differences between pre-test and post-test scores of Group A and Group B. Mann Whitney U test and Wilcoxon signed-rank test was used to test the statistical differences between pre-test and post-test scores of Group A and Group B. Mann Whitney U test was analyzed in finding hypothesis being tested identifies whether there exists a statistically significant difference in consideration of the treatment given. An alpha level of P = 0.05 was measured to be statistically significant. The statistical analysis was done with the help of IBM SPSS version 23.0

Results

Table 1 Comparison between pre-test and post-test of DASH scale in control group

Test	Mean	SD	N	Z value	p value
Cntr1_Pre	67.0747	4.3937	15	-3.408	0.001*
Cntr1_Post	56.3553	6.54806	15		

* Significant at 5% alpha level

Table 2 Comparison between pre-test and post-test of DASH scale in experimental group

Test	Mean	SD	N	Z value	p value
Expt1_Pre	64.58	4.61439	16	-3.518	0.00*
Expt1_Post	42.8019	6.75796	16		

* Significant at 5% alpha level

In the Experimental group, since the p value of 0.00 is less than 0.05, alternate hypothesis is accepted. Hence, there is statistically significant difference in Experimental Group between pre-test and post test scores of DASH. This suggests that the intervention received by the experimental group had significant improvement.

Table 3 Comparison between post-test of control and experimental group in DASH scale

Group	Mean	SD	N	Z value	p value
Cntr1_Post	56.3553	6.54806	15	-3.933	0.00
Expt1_Post	42.8019	6.75796	16		

*Significant at 5% alpha level

Since the p value of 0.00 is lesser than 0.05, alternate hypothesis is accepted. Hence, there is statistically significant difference in post test scores between Experimental and Control Group of the DASH. This suggests that the intervention received by the experimental group had more improvement when compared to the control group.

Table 4 Comparison between pre-test and post-test of GSE scale in control group

Test	Mean	SD	N	Z value	p value
Cntr2_Pre	15.3333	2.69037	15	-3.431	0.001
Cntr2_Post	19.4667	2.74816	15		

* Significant at 5% alpha level

Since the p value of 0.001 is lesser than 0.05, alternate hypothesis is accepted. Hence, there is statistically significant difference between pre- test and post test scores in the Control Group of the GSE. This suggests that the intervention received by the control group had significant improvement.

Table 5 Comparison between pre-test and post-test of GSE scale in experimental group

Test	Mean	SD	N	Z value	p value
Expt2_Pre	16.75	3.02214	16	-3.524	0.00*
Expt2_Post	24.8125	2.99374	16		

* Significant at 5% alpha level

In the Experimental group, since the p value of 0.00 is less than 0.05, alternate hypothesis is accepted. Hence, there is statistically significant difference in Experimental Group between pre-test and post test scores of GSE. This suggests that the intervention received by the experimental group had significant improvement.

Table 6 Comparison of pretest post-test of GSE scale between control and experimental group

Group	Mean	SD	N	Z value	p value
Cntr2_Post	19.4667	2.74816	15	3.755	0.00*
Expt2_Post	24.8125	2.99374	16		

*Significant at 5% alpha level

Since the p value of 0.00 is lesser than 0.05, alternate hypothesis is accepted. Hence, there is statistically significant difference in post test scores between Experimental and Control Group of the GSE. This suggests that the intervention received by the experimental group had more improvement when compared to the control group.

Discussion

The study aimed to assess the effect of graded repetitive arm supplementary program in improving upper extremity function and self-efficacy among women with post-operative breast cancer and to determine the correlation between upper extremity function and self-efficacy. A total of 33 post mastectomy women were selected using the selection criteria described in methodology and randomly allocated to the experimental group (16 samples) and control group (18 samples). 2 samples were excluded from control group due to their personal reasons. The age group of the sample selected range from 30 to 55 years. The level of upper extremity functioning in both experimental and control groups were measured by the Disabilities of Arm, Shoulder, and Hand (DASH). The experimental group underwent a graded repetitive arm supplementary program based intervention for three months, three sessions per week with the duration of 45 minutes per session. Whereas, control group underwent conventional occupational therapy. After a three months of intervention the posttest evaluation was done for both the groups and the score were calculated and results analyzed. The effect of intervention was analyzed by comparing pretest and posttest values of both the control and experimental group.

Table 1 showed the comparison of the DASH scale between pretest and posttest mean score of the control group and The TABLE 4 showed the comparison the GSE scale between pretest and posttest mean score of the control group. Since the p value of 0.001 is lesser than 0.05, alternate hypothesis is accepted. There is statistically significant improvement in upper extremity function and self-efficacy with the effect of conventional occupational therapy intervention. This study is supported by the previous study done by Junling zhu, jia wang (2023), have investigate the effect of upper extremities exercise based on mirror therapy in the postoperative recovery of shoulder function in breast cancer patients. This study concluded that the application of mirror therapy is beneficial to the mobility of shoulder joint, and it promotes the functional recovery of shoulder joint, whereby preventing lymphedema of the upper extremities in the postoperative breast cancer patients in conventional occupational therapy.

The Table 2 showed the comparison of Dash scale between pretest and posttest mean score among the experimental group, The TABLE 5 showed the comparison of GSE scale between pretest and posttest mean score among Experimental group, since the p

value of 0.00 is less than 0.05, alternate hypothesis is accepted. Hence, there is statistically significant improvement in upper extremity function and self-efficacy with the effect of experimental Group between pre-test and post test scores of GSE. This suggests that the intervention received by the experimental group had significant improvement. The present study supported by priyankanoble, sindhulms (2020), and they have done the study to evaluate the effect of GRASP on upper limb function among patients with stroke and concluded that there was an improvement in upper limb function of patients with stroke in sub-acute phase.

The Table 3 showed the comparison of post-test mean score of control and experimental group of DASH scale, The TABLE6 showed the comparison of post-test mean score of control group and experimental group of GSE scale, since the p value of 0.00 is lesser than 0.05, alternate hypothesis is accepted. Hence, there is statistically significant improvement in upper extremity function and self-efficacy in post test scores between Experimental and Control Group of the GSE. This suggests that the intervention received by the experimental group had more improvement when compared to the control group. The study supported by a review done by, punith Kumar SN and Prem kumarBN (2017), have found out the effect of Graded Repetitive Arm Supplementary Program (GRASP) on arm function in Activities of Daily Living among acute stroke patients. Significant improvement in upper limb function was observed using Graded Repetitive Arm Supplementary Program (GRASP).

Conclusion

The study results revealed that the graded repetitive arm supplementary program improved upper extremity function and self-efficacy among women with post-operative breast cancer. So this intervention can be incorporated with the conventional occupational therapy for the better improvement among women with post-operative breast cancer.

Limitation and Recommandation

This study was done in small sample size, the age group was restricted between 30 – 55 years, with short duration, conducted only in one hospital setup. The study can be done with large sample size with Randomized control trials. This study can also be done to the other conditions who experience difficulties in upper extremity functions.

Conflict of interest

No conflict of interest

Ethical approval

This study has been approved by the Institution Scientific Review Board (ISRB) of Saveetha College of Occupational Therapy with REF.NO of SCOT/ISRB/053/2023.

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