

Effects of Progressive Muscle Relaxation Technique in Reducing Depression and Improving the Quality of Life of Post Operative Heart Valve Replacement Outpatients

M. Mahendiran¹, J. Keerthana², S. Kiruthika², S. Manjuma Devi², S. Mouliraj²

¹Associate Professor, ²Intern (PT),

Department of Basic Physiotherapy Subjects, P.S.G College of Physiotherapy and Hospitals, Coimbatore, Tamilnadu, India

Corresponding Author: M. Mahendiran

ABSTRACT

Background & Objective: The objective of the study was to find out the effectiveness of progressive relaxation technique on reducing depression and improving the quality of life of post-operative valve replacement out patients

Study Design: Randomized controlled trial.

Participants: 42 post- operative heart valve replacement out patients

Sampling: simple random sampling

Study Duration: 6 months.

Treatment Duration: 2 sessions per day (30 to 45 min per session) along with the routine physiotherapy exercises for 7 days – total of 14 sessions

Measurement tools:

-Beck depression inventory (depression assessment)

-SF36 (quality of life)

Study Setting: Department of cardio thoracic and vascular surgery, PSG Hospital, Coimbatore.

Results: The mean values of posttest of group 1 and group 2 for BDI are 19.90 & 24.52, for SF 36-emotional wellbeing are 60 & 39.62, for SF 36- social functioning are 61 & 54.86, and the calculated paired 't' test and independent 't' test values are more than the table value at $p < 0.05$. Based on these values, there is significant reduction in depression and improvement in quality of life of group 1 (experiment) than group 2 (control)

Conclusion: This study concludes that progressive muscle relaxation technique showed a higher positive result in reducing depression and improving the quality of life of post-operative heart valve replacement outpatients.

Key Words: progressive relaxation technique, valve replacement, quality of life

INTRODUCTION

Cardio vascular diseases are the most common cause of mortality worldwide and valvular heart diseases are one of the common cardiovascular diseases². The conservative estimate of the global burden of RHD in 2005 was 15.6- 19.6 million existing cases, and an approximate global incidence of 282,000 new cases per year¹².

Valvular heart disease is more prevalent in underdeveloped and developing countries than in developed countries and among the population with multiple social issues such as poverty, low socio economic status, overcrowded dwellings, under nutrition, poor sanitation, cultural constraints and suboptimal medical care¹¹. Valve

replacement is the final option for Valvular heart diseases.

Usually cardiac surgery is known to be accompanied by post-operative anxiety and depression¹ as well as both intubation and extubation can increase the concentration of catecholamines in the blood by stimulating the sympathetic nervous system and resulting in severe hemodynamic changes³. Increased anxiety and depression is correlated with poorer quality of life and worse long term psychological outcomes¹. Signs of depression are seen in 32% of patients before surgery, in 28% immediately after surgery, and in 26% 3 months after surgery² (Farkhondeh Sharif et al.,2012).

Although pharmacotherapy can successfully treat anxiety and depression, psychiatric medications alone or through their interaction with other drugs can produce side effects like drowsiness, dry mouth, nausea, constipation etc., and some patients are unwilling to take psychiatric medications⁵. Some patients may be unwilling to take any additional drugs, perceiving that as a sign of loss of control and personal weakness in the handling of their illness⁵.

Relaxation techniques have been shown as an effective adjunctive therapy for anxiety and depression providing patient with self-maintenance coping skills to reduce psychological symptoms⁵. Among various relaxation techniques available, Progressive muscle relaxation technique (PMRT) is the popular technique known for its muscle tension relieving effects and consists of series of exercises involving tensing and relaxing 18 major muscle groups⁴. Progressive relaxation exercises were first developed in 1920's by Jacobson and then implemented into the technical science community by Hebert Benson³.

Thus, with progressive muscle relaxation technique, the sympathetic nervous system tone decreases and the parasympathetic nervous system increases, so the heart rate slows down, blood pressure

drops, breathing rate decelerates, oxygen need decreases, metabolic rate slowdown, pupils dilate being peripheral dilatation and increasing peripheral blood flow to big muscle increases muscular rigidity, stress, fatigue and pain reduce and comfortable sleep is provided. It enables to have a deep rest and great refreshment and almost a sense of rebirth³. The present study is therefore undertaken to examine the effect of progressive muscle relaxation technique on depression and quality of life of depressed patients who have undergone valve replacement surgery.

NEED OF THE STUDY

Usually Any Cardiac surgery is known to be accompanied by postoperative anxiety and depression. Increased anxiety and depression is correlated with poorer quality of life and worse long term psychological outcomes. Hence there is a need to examine the effect of progressive muscle relaxation technique on depression and quality of life of depressed patients who have undergone valve replacement surgery.

SPECIFIC OBJECTIVE

To find out the effectiveness of progressive muscle relaxation technique (PMRT) on reducing depression and improving the quality of life of postoperative heart valve replacement outpatients.

HYPOTHESIS

Null Hypothesis- There will be no significant improvement in reduction of depression and in improving quality of life following progressive muscle relaxation technique.

Alternate Hypothesis- There will be a significant improvement in reduction of depression and in improving quality of life following progressive muscle relaxation technique.

MATERIALS AND METHODS

STUDY DESIGN:

Randomized controlled trial

STUDY SETTING:

Department of Cardio thoracic and vascular surgery (CTVS), PSG Hospitals, Peelamedu, Coimbatore

STUDY DURATION: 6 MONTHS

TREATMENT DURATION:

From 7th post-operative day to 13th post-operative day

Group 1: Routine physiotherapy exercise as per the hospital protocol + 30-45 minutes of progressive muscle relaxation exercise (2 sessions per day) for 7 days – total of 14 sessions.

Group 2: Routine physiotherapy exercise as per the hospital protocol

POPULATION AND SAMPLING:

Post-operative heart valve replacement outpatients from the unit of cardio- thoracic and vascular surgery in PSG hospital, Coimbatore were chosen as population for this study. A total number of 42 patients were selected by random sampling method (Lot method).

CRITERIA FOR SAMPLE

SELECTION:

Inclusion Criteria:

- Age: 25-60years.
- Post - operative heart valve replacement out patients.
- BDI score < 30
- On regular follow up

Exclusion Criteria:

- Patient with bleeding history
- Infected Sternal site
- Severe sternal site pain
- Severe left ventricular dysfunction patients.
- Patients with pressure sores
- Hemodynamic instability

DATA ANALYSIS & INTERPRETATION

A Number of 42 postoperative heart valve replacement outpatients were included in this randomized control trial study in which Group 1(n=21)(Experimental) and Group 2(n=21) (Control) were analysed. The Pre and posttest values of beck depression inventory and SF 36 health questionnaire- emotional wellbeing and social functioning for the patients in group 1(n=21) were presented in table (1,3,5)and for group 2(n=21) in table (2,4,6).The mean, SD and paired 't' test is used to find out whether there is significant difference between pre-test and post-test values within the groups Independent 't' test, mean difference values for BDI, SF 36- emotional wellbeing and social functioning of group 1 & 2 is used to find out the significance between the groups. Paired 't' Test: To measure the difference between the Pretest and Posttest values within the group.

Table1.Beck depression inventory

	MEAN	Standard deviation	Mean difference	't' value	p value
GROUP 1 (experiment n = 21) POST	19.90	5.99	5.67	11.46	p< 0.05
PRE	25.57	5.21			
GROUP 2 (control n=21) POST	24.52	5.34	1.31	3.64	p< 0.05
PRE	25.81	5.64			

Table 2.SF 36- emotional well being

	MEAN	Standard Deviation	Mean difference	't' value	p value
GROUP 1 (experiment n=21) POST	60.00	7.90	13.71	6.85	p< 0.05
PRE	46.29	7.22			
GROUP 2 (control n=21) POST	39.62	8.94	2.28	0.79	p>0.05
PRE	41.90	7.00			

SF36, short form 36

Table 3.SF 36- Social functioning

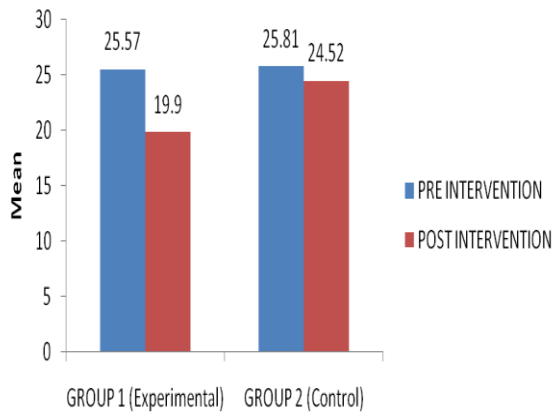
	MEAN	Standard deviation	Mean difference	't' value	p value
GROUP 1 (experiment n=21) POST	61.00	9.08	14.33	3.81	p< 0.05
PRE	46.67	11.20			
GROUP 2 (control n=21) POST	54.86	8.31	7.43	4.12	p< 0.05
PRE	47.43	11.09			

SF36, short form 36

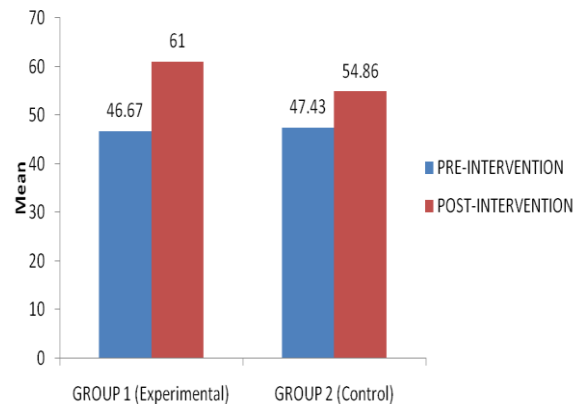
Table 4. INDEPENDENT 't' TEST STATISTICS

GROUPS	MEAN	Standard Deviation	Mean difference	't' value	p value
Post BDI EXPERIMENT	19.90	5.99	4.62	2.64	p< 0.05
CONTROL	24.52	5.34			
Post SF 36 EMOTION EXPERIMENT	60.00	7.90	20.38	7.83	p< 0.05
CONTROL	39.62	8.94			
Post SF 36 SOCIAL EXPERIMENT	61.00	9.08	6.14	2.29	p< 0.05
CONTROL	54.86	8.31			

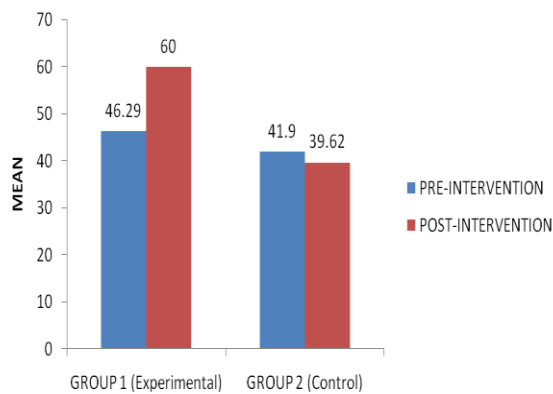
BDI , beck depression inventory; SF36, short form 36



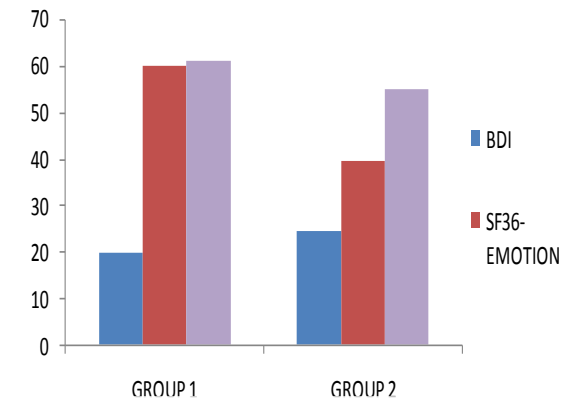
Graph 1. Difference between pre and post test mean values based on Beck depression inventory of Group 1 (EXPERIMENTAL) and Group 2 (CONTROL)



Graph 3. Difference between pre and post test mean values based on SF 36- Social functioning of Group 1 (EXPERIMENTAL) and Group 2 (CONTROL)



Graph 2. Difference between pre and post test mean values based on SF 36-Emotional well being of Group 1 (EXPERIMENTAL) and Group 2 (CONTROL)



Graph 4. COMPARISON OF POST MEAN DIFFERENCE VALUES OF GROUP 1 (EXPERIMENT) AND GROUP 2 (CONTROL)

RESULTS & DISCUSSION

This randomized control trial study was conducted to determine the effect of progressive muscle relaxation technique in reducing the depression and improving the quality of life of postoperative heart valve replacement outpatients. A total of 45 patients were assessed for the study. Out of which 42 patients who met the inclusion criteria participated in the study. They were selected by random sampling method (on lot basis) and assigned into two groups. Group 1 (PMRT with routine physiotherapy protocol) consisted of 21 patients and Group 2 (routine physiotherapy protocol alone) consisted of 21 patients, PMRT was given 2 sessions/ day for 7 days, a total of 14 sessions. PMRT is a method that can be easily learned to achieve relaxation. It is a cost effective intervention which needs only minimal training³. It is an exercise that relaxes the mind and body by progressively tensing and relaxation of muscle groups. The relaxation response limits the stress response, leading to reduced sympathetic nervous system tone. This action results in decreased muscle tension, oxygen consumption, blood pressure, heart and respiratory rate³. Pre assessment was taken on the day of discharge and post assessment was taken on 14th day (first review). Instruction audio and pamphlet was given the patients and was monitored through phone calls. After a week significant improvement was noted in reducing depression and in mental components of QOL, which was assessed through beck depression inventory and SF 36 respectively. The BDI value of post intervention mean= 19.90 is decreased in GROUP1 compared to pre intervention mean = 25.57 with mean difference of 5.67. The BDI value of post intervention mean= 24.52 is decreased in GROUP 2 compared to pre intervention mean = 25.83 with mean difference of 1.31. The calculated value of paired 't' test for BDI in GROUP 1 is 11.46 which is more than the table value $p < 0.05$ and for GROUP 2 is 3.64 which is more than the table value, indicating that there is

significant difference within both the groups but group 1 shows higher significance than group 2. The calculated independent 't' test value of BDI between group 1 and group 2 shows significant improvement with a mean difference of 4.62 and $t = 2.64$ at $p < 0.05$. The SF 36- EMOTIONAL WELL BEING value of post intervention mean= 60.00 is increased in GROUP 1 compared to pre intervention mean= 46.29 with mean difference of 13.71. The SF 36- EMOTIONAL WELL BEING value of post intervention mean= 39.62 is decreased in GROUP 2 compared to pre intervention mean=41.90 with mean difference of 2.28. The calculated value of paired 't' test for SF 36- EMOTIONAL WELL BEING in GROUP 1 is 6.85 which is more than the table value $p < 0.05$ and for GROUP 2 is 0.79 which is less than the table value, indicating that there is significant difference only in group 1. The calculated independent 't' test value of SF 36- EMOTIONAL WELL BEING between group 1 and group 2 shows significant improvement with a mean difference of 20.38 and $t = 7.83$ at $p < 0.05$. The SF 36- SOCIAL FUNCTIONING value of post intervention mean= 61.00 of group 1 is increased in GROUP 1 compared to pre intervention mean= 46.67 with a mean difference of 14.33. The SF 36- SOCIAL FUNCTIONING value of post intervention mean= 54.86 is increased in GROUP 2 compared to pre intervention mean=47.43 with a mean difference of 7.43. The calculated value of paired 't' test for SF 36- SOCIAL FUNCTIONING in GROUP 1 is 3.81 which is more than the table value $p < 0.05$ and for GROUP 2 is 4.12 which is more than the table value, indicating that there is significant difference within both the groups. The calculated independent 't' test value of BDI between group 1 and group 2 shows significant improvement with a mean difference of 6.14 and $t = 2.29$ at $p < 0.05$. Hence, PMRT has been proven effective in reducing depression and anxiety in variety of conditions including insomnia, asthma, CABG & chemotherapy induced nausea⁵.

This study provides evidence supporting psychosomatic intervention in psychological health and QOL of patients⁵. In conclusion, PMRT has showed significant improvement in reducing depression and improving the QOL. Thus, PMRT can be included in cardiac rehabilitation¹. Further limitations of this study includes,

- Blinding was impossible as study included active participation of the patient.
- This study has small sample size.
- This study has short duration of follow up
- This study excluded unstable patients.
- This study excluded patients with severe depression
- The environment was not suitable for relaxation exercise
- Monitoring was difficult.

Future suggestions are

- Since this was a short term study, continued effects of PMR practice after completion of the study can be taken as a topic for future studies.
- The study can be done in a large sample and can also include unstable patients.
- This study was based on self-report questionnaires, it would be helpful to verify the findings in future studies using statistical manual of mental disorders (DSM – V) criteria for anxiety and depression.
- PMRT can be used as an adjuvant therapy along with routine physiotherapy protocol to reduce depression and improve the quality of life of patients

CONCLUSION

With the reference to the statistical analysis done from the collected data of Beck Depression Inventory and SF 36-emotional wellbeing and social functioning shows the effects of progressive muscle relaxation technique in postoperative heart valve replacement outpatients. Therefore, from the literature available and its

statistical analysis of the data obtained following the treatment, concluded that, Progressive muscle relaxation technique (PMRT) along with routine physiotherapy protocol showed a higher positive result in reducing Depression and improving the quality of life of postoperative heart valve replacement outpatients.

Conflict Of Interest:

No potential conflict of interest relevant to this article was reported

ACKNOWLEDGMENTS

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