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A Comparative Study to find out the Effectiveness of Jacobson Progressive Muscular Relaxation and Isometric Handgrip Training among Hypertension Patients

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Abstract: ***Background: Hypertension is one of the top diseases. Since most individuals suffer from hypertension. It is often called the silent killer disease. Probably, hypertension is a major health problem. The population at risk above the age of 20 years has systolic blood pressure above 140 mmHg and or diastolic blood pressure above 90 mmHg. The systolic and diastolic blood pressure is the type of outcome measure to assess hypertension by sphygmomanometer. Method: The study was a comparative study of 30 patients selected from Sri Venkateshwaraa Hospital & Research Center, Ariyur, and Jacobson's Progressive Muscular Relaxation and isometric handgrip training given to the patients for 6 weeks. The outcome measure systolic and diastolic blood pressure was measured in pre and post - test for 6 weeks. Result: The statistical analysis done using paired t - test with values of the group shows the significance of (p<0.001). The group analysis of post values shows that the study is significant. After the statistical analysis, it shows that there is improvement in (Group A) Jacobson's progressive muscular relaxation. This shows it proves to be an effective tool for efficiency. Conclusion: This study concluded that the Jacobson progressive muscular relaxation (Group A) shows more significant improvement in reducing systolic and diastolic blood pressure among hypertension patients when compared with isometric handgrip training (Group B).***

Keywords: Hypertension, Jacobson's progressive muscular Relaxation, Isometric Handgrip training, Sphygmomanometer.

1. Introduction

Hypertension is a condition in which the force of the blood against the artery walls is too high usually hypertension is defined as blood pressure above 140/90, and is considered severe if the pressure is above 180/120 [(1).] There are countless methods used to achieve relaxation, but the procedure that is most commonly practiced in the clinical setting is Jacobson's' (1938) progressive muscular relaxation [(2),] Handgrip training is simple to use, inexpensive, and accessible to the global population. It may be preferred by people who dislike physical activity [(3).]

2. Materials and Methodology

The study design was a comparative study that includes 30 hypertension patients selected from the Department of Physiotherapy, Sri Venkateshwaraa group of Institutions (Ariyur Pondicherry). They were allocated into two groups, group A (n=15) Jacobson Progressive muscular relaxation. Group B (n= 15) Isometric handgrip training, the subjects were included based on selection criteria. The inclusion criteria of the study were Subjects in the age group of 45 to 60 years, primary hypertension, both male and female genders included, subjects who are willing to participate in the study, systolic blood pressure above 140 - 160 mmHg Or blood pressure above 90 - 120 mmHg and exclusion criteria were subjects with any upper limb fracture, like any recent cardiac surgery (CABG), controlled hypertension, Neurological problems like stroke, head injury, neurological problems like myocardial infractions, hypertension patient with the associated problem (like thyroid, psychology problems). In both groups, the subject's – test and post–test values were collected using the sphygmomanometer. The treatment duration is about 3 days/week for 6 weeks, the outcome measure sphygmomanometer was measured in pre and post - test for 6 weeks period.

3. Procedure

Group A: [Jacobson Progressive Muscular Relaxation]
The patient's position is supine lying, a pillow is kept under the neck. The therapist's position is standing behind the patient. Technique Jacobson's progressive muscular relaxation, the investigator demonstrated the technique to contract and relax various groups' f muscles, to coordinate contractions and relaxation with deep breaths, and to perform the entire procedure with eyes closed in a supine lying down position. Duration is 30 minutes and 3 sessions per week for 6 weeks

Figure 1: Jacobson Progressive Muscular Relaxation

Group B: [Isometrichand grip Training Exercise]

The patient's position is standing. The therapist positioned standing behind the patient and the technique is Start with a lower amount of resistance first, then work way up to more resistance. Squeeze the hand exercise fully with the arm straight. Do not twist the arm or body when squeezing the exerciser. Keepthe arm straight, the arm raised at the side. Do this exercise by standing with the legs slightly apart or sitting down with the feet on the floor. May find doing this exercise in front of a mirror can be helpful to ensure that the form is correct. Repeat for at least 2 minutes, then rest for 1 minute. Shift to the left hand and repeat the squeeze - and - hold pattern. Do this for at least two minutes. Continue with the process, until four complete sets are performed for each hand for a total of 10 minutes of squeezing. As the exercise becomes much easier, try holding the contractions for at least a few seconds more on each hand until strength is built up. Duration is 10 minutes and 3 Sessions per week for 6 weeks. Repetition is 4 Sets of isometric contractions.

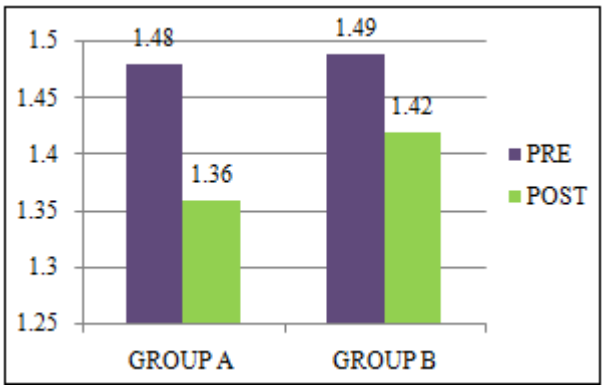
Figure 2: Isometric Handgrip Training

4. Statistical Analysis & Results

In a study **"A comparative study to find out the effect of Jacobson progressive muscular relaxation and Isometric handgrip training among hypertension patients "** - the pre - test and post – interventional differences within the two groups were analyzed using paired 't' and the interventional difference between the two groups were analyzed using unpaired 't - test for the outcome, statistical analysis was set at $p<0.001$. The data obtained were analyzed using both the paired and unpaired t - test and were tabulated. The calculated 't' value obtained from paired 't – test of group A (within group analysis) of the sphygmomanometer for 14 degrees of freedom and level of significance was 6.38 and group B was 4.98 with the p–value<0.0001 (Table 1). In the statistical analysis obtained from the sphygmomanometer, the mean values and SD Obtained from Group A and Group B of the sphygmomanometer were 1.4887± 0.0901& 1.3633± 0.0473, and 1.4953 ± 0.0788 & 1.4293 ± 0.0808 respectively. For 28 degrees of freedom and a level of significance, the calculated t - value obtained from the unpaired t - test of the sphygmomanometer is 2.39 (Table 2)

Table 1: Showing the pre andpost - test values of Group A and Group B (Paired t - test values)

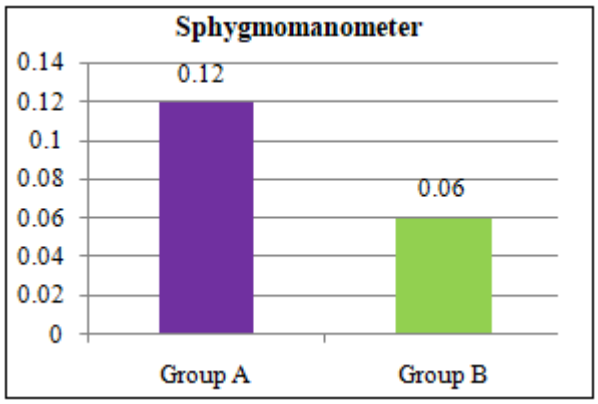
Group	Test	Mean	S. D	T - Values	p - Values
Group A	Pre - test	1.4887	0.0901	6.3827	<0.0001
	Post - test	1.3633	0.0473		
Group B	Pre - test	1.4953	0.0788	4.9885	0.0002
	Post - test	1.4293	0.0808		



Graph 1: Within - Group Analysis of Sphygmomanometer

Table 2: Showing the pre and post - test of Group A&B (unpaired t - test values)

Group	Mean	S. D	T - Values	p - Values
Group A	0.1253	0.0761	2.3987	0.0236
Group B	0.0671	0.0512		



Graph 2: Between the group analysis of the Sphygmomanometer

5. Discussion

This present comparative study has been conducted at Sri Venkateshwaraa College of Physiotherapy at Ariyur,

Puducherry, for 30 hypertension patients. All the hypertension patients were assessed with systolic and diastolic blood pressure by sphygmomanometer. The duration of the study was 6 weeks. The outcome measures used to assess were, Jacobson progressive muscular relaxation and Isometric handgrip training. **PHILIP J. MILLAR et al.** concluded the study on **The Effect of Isometric Handgrip Effects on Hypertension Among Hypertension Patients**. This study aims to determine the effect of isometric handgrip training to reduce blood pressure. This study demonstrates a hypotensive effect of IHG training in medicated and un - medicated patients. This novel therapy may be efficacious based on low associated costs and time requirement (33 min week). The mechanism coupled with the attenuation in resting blood pressure remains contentious. While further IHG research is required, the prospect of a novel non - pharmacological therapy for hypertension has major public health implications. Isometric handgrip training improves endothelial dysfunction by shear - stress medical improved bioavailability of nitric oxide and increased antioxidant has been shown that there is a disease in muscle sympathetic nerve activity, increase cardiovascular capacity and decrease myocardial oxygen demand. The study concluded that improves blood pressure in hypertension after the IHT is given [(1).] **NISHA SHINDE et al.** concluded the study of **The Effect of Jacobson's Progressive Muscular Relaxation Among Hypertension.** A total of 250 college teachers were screened for hypertension. The deep relaxation technique produces an immediate reduction in the state of anxiety. Out of these 105 subjects were found suitable and willing to participate in the study to reduce blood pressure (systolic ordiastolic blood pressure) and the conclusion shows that isometric handgrip training improves blood pressure [(2).] **ABU BAKAR et al.** concluded the study of **The Effect of Listening to Asmaul Husna, Isometric Handgrip Exercise, and Foot Hydrotherapy Intervention to Reduce Blood Pressure in the Elderly with Hypertension** This aims to determine the effect of isometric handgrip training in reducing systolic and diastolic blood pressure. This is non - Pharmacological methods can reduce blood pressure, namely the intervention of listening to Asmaul Husna, isometric handgrip exercise, and foot hydrotherapy. The independent variable in this study was listening to Asmaul Husna, isometric handgrip exercise, and foot hydrotherapy intervention, while the dependent variables were systolic, diastolic blood pressure, and pulse. Listening to Asmaul's isometric handgrip exercise, and foot hydrotherapy interventions have positive benefits for reducing systolic and diastolic blood pressure, and pulse in elderly with hypertension [(3).] **IDA ROSDIANA et al.** concluded the study on **The Effect of Progressive Muscle Relaxation (PMR) on Blood Pressure among Patients with Hypertension**. This non –pharmacological therapies including lifestyle modification, stress management, and anxiety are the first steps that must be taken. One of the efforts to manage stress and anxiety that can be done is by progressive muscle relaxation on blood pressure reduction in hypertensive patients. The research design used a method quasi - experimental with a sampling technique carried out by purposive sampling, totaling 52 people, namely 26 people in the control group. This study can conclude that improves blood pressure among hypertension after progressive muscular relaxation [(4).] Our study proved that reduces systolic and diastolic blood pressure. But, the Jacobson Progressive Muscular Relaxation technique is more significant than the Isometric Handgrip Training.

6. Conclusion

Finally, this study concludes that the Jacobson progressive muscular relaxation and isometric handgrip training reduce the systolic & diastolic blood pressure among hypertension patients for 6 weeks intervention period. But, Jacobson's muscular relaxation technique is more significant than isometric handgrip training. So, this study has rejected the null hypothesis.

7. Limitations and Recommendations

The limitation of the study was small samples were selected, the study duration was 6 weeks, and Only age groups between 45 - 60 were taken. Recommendations of the study were further the study can have more participants, Improve study duration by more than 6 weeks, Large sample size can be selected, Advance outcome tools can be used, and More techniques needed to reduce blood pressure. Therefore the null hypothesis is rejected.

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