IJCRT.ORG ISSN : 2320-2882

INTERNATIONAL JOURNAL OF CREATIVE RESEARCH THOUGHTS (IJCRT)

An International Open Access, Peer-reviewed, Refereed Journal

A Study To Assess The Effectiveness Of Mirror Therapy Upon Motor Function Of Upper Extremity Among Stroke Patients

Mrs. PRADEEPHA N[1], Dr. LIZY SONIA[2]

Assistant Professor[1],Professor[2], Department of Medical and Surgical Nursing, College of Nursing Sciences, Dayananda Sagar University, Bengaluru.

ABSTRACT

Background: Stroke is becoming an important cause of premature death and disability in low-income and middle-income countries like India, largely driven by demographic changes and enhanced by the increasing prevalence of the key modifiable risk factors. Majority of stroke survivors continue to live with disabilities, and the costs of on-going rehabilitation and long-term care are largely undertaken by family members, which improvises their families. Motor deficits are the most obvious effect of stroke. Mirror therapy is a specific therapy designed to strengthen arms and hands weakened by a stroke. In mirror therapy, by using some movements of the stronger hand and arm to "trick our brain" into thinking that the weaker arm is moving. **Method:** Screening of stroke patients was done by using demographic and clinical variable proforma, 60 samples were drawn through purposive sampling technique. The level of motor functionwas assessed by using Fugl-Meyer motor function assessment tool before and after the mirror therapy. The duration of mirror therapy is for 20-30 minutes for 5 days per week totally for a period of 3 weeks for each sample.The data gathered were analyzed by descriptive and inferential statistical method. **Results:** The findings revealed that there was no association between demographic and clinical variable preforma, but most importantly, pretest mean score and standard deviation of motor function of upper extremity was (M=15.93, SD=5.11) in control group and(M= 16.26, SD=4.99) in experimental group with 't' value 3.42 which was not statistically significant at $p>0.05$ whereas after mirror therapy there was a difference in the mean and standard deviation of motor function (M= 2.63, SD=6.95) in control group and (M= 37.1, SD=4.04) in experimental group with 't' value of 0.59 which was statistically significant at $p<0.01$,Hence the therapy was useful for the stroke patients. There was no association between demographic and clinical variable proforma. **Conclusion:** The present study concluded that mirror therapy was effective in improving the motor function of upper extremity among stroke patients. Majority of the patients receiving mirror therapy in experimental group was highly satisfied the effectiveness of therapy and approach of researcher.

INTRODUCTION:

Stroke is a disease of the central nervous system caused by partial loss of brain function which can lead to motor disorders, perception disorders, language disorders, sensory disturbances etc., and two out of three patients experience damage to motor function in the upper limbs. Furthermore, stroke can bring about limitations in activities of daily living, such as eating and dressing/undressing also, disability in bodily functions develops in about 66% of patients and in activities of daily living in about 75% of patients. Therefore, the upper limb function of stroke patients is an important factor in dailyliving that needs to be emphasized in the rehabilitation field. Kim (2016)

According to the World Health Organization, 15 million people suffer stroke worldwide each year. Of these, 5 million die and another 5 million are permanently disabled. High blood pressure contributes to more than 12.7 million strokes worldwide. (WHO, 2016).

In India, from 2003 to 2013, the relative rate of stroke death fell by 33.7% more among those >65 years and the actual number of stroke deaths declined by 18.2%. Yet each year, 795,000 people continue to experience a new or recurrent ischemic or hemorrhagic stroke. (WHO, 2016).

Motor deficits are the most obvious effect of stroke. The characteristics of motor deficits includes loss of skilled voluntary movement, impairment of integration of movements, alterations in muscle tone, and alterations in reflexes. A stroke affecting the middle cerebral artery leads to a greater weakness in the upper extremity. The affected shoulder tends to rotate internally. Spasticity of the muscles follows the flaccid stage and is related to interruption of upper motor neuron influence. Lewis (2011)

Mirror therapy is a form of motor imagery in which a mirror is used to convey visual stimuli to the brain through observation of one's unaffected body part as it carries out a set of movements. The underlying principle is that movement of the affected limb can be stimulated via visual cues originating from the opposite side of the body. Hence, it is thought that this form of therapy can prove useful in patients who have lost movement of an arm or leg especially those who have had a stroke.

Invernizzi (2013) conducted a randomized controlled trial on the value of adding mirror therapy for upper limb motor recovery of sub-acute stroke patients in that they found mirror therapy is a promising and easy method to improve motor recovery of the upper limb in sub-acute stroke patients. While mirrortherapy use has been advocated for acute patients with no or negligible motor function, it can be usefully extended to patients who show partial motor recovery. The easiness of implementation, the low cost and the acceptability makes this

therapy a useful tool in stroke rehabilitation.

NEED FOR THE STUDY

Upper limb weakness following a stroke affects patients' abilities to undertake activities of daily living and has a negative impact on rehabilitation treatment. Nurses have a role in providing therapy to patients and will need to apply expert clinical judgement and reasoning to assess and identify the effects of individual treatment techniques for patients with upper limb weakness. (Pollock, 2014).

Ezendam (2009) conducted a systematic literature search to identify studies concerning mirror therapy in upper extremity. The included journal articles were reviewed according to a structured diagram and the methodological quality was assessed. Fifteen studies were identified and reviewed. The present review showed a trend that mirror therapy is effective in upper limb treatment of stroke patients.

Mirror therapy enhances upper extremity motor recovery in stroke patients. It is randomized controlled trail the purpose of this study was to evaluate the effects of mirror therapy program in addition with physical therapy methods on upper limb recovery in patients with sub-acute ischemic stroke.15 subjects followed a comprehensive rehabilitative treatment,8 subjects received mirror therapy and 7 subjects received only control therapy and 7 subjects received mirror therapy for 30 minutes every day, five times a week, for 6 weeks in addition to the conventional therapy. Mirror therapy is an easy and low-cost method to improve motor recovery of the upper limb. Mirela Cristina L,et al.(2015)

Kim k et al(2016)published in the journal of physical therapy science twenty-five stroke patients who were receiving physical therapy and other group received mirror therapy. The therapies were applied for 30minutes per day, five times per week, for a total of 4 weeks. Upper limb function was measured with the action research arm test, the Fugl- Meyer assessment, and the box and block test, and activities of daily living were measured with functional independence measure. The findings of this study demonstrated that mirror therapy is more effective than conventional therapy for the training of stroke patients to improve their upper limb function and activities of daily living.

During the clinical experience, the researcher had come across with several stroke patients having decreased motor function or loss of motor function. Thus the researcher envisioned that providing mirror therapy helps in improving motor function of upper extremity and activity of daily living. These therapies can be used as a regular therapy for all patients.

OBJECTIVES OF THE STUDY

- To assess the level of motor function of upper extremity before and after mirror therapy in the control group and the experimental group of stroke patients.
- To determine the effectiveness of the mirror therapy by comparing the motor function of upper extremity between the control group and the experimental groupof stroke patients.
- To find out the association between the demographic variables and the motor function of upper extremity among the control group and the experimental group of stroke patients.
- To find out the association between the clinical variables and the motor functionof the upper extremity among the control group and the experimental group of stroke patients.
- To assess the satisfaction regarding mirror therapy in the experimental group of stroke patients.

METHOD

RESEARCH APPROACH

The quantitative research approach was used in this study

RESEARCH DESIGN

Quasi experimental design was used

RESEARCH SETTING

The study was conducted at Apollo Main Hospitals, Greams Road and Apollo Specialtiy Hospitals Vanagaram, Chennai.

POPULATION

In this study the target population comprises of stroke patients.

The accessible population, in this present study was patients who are having upper extremity paralysis after stroke in Apollo hospitals, Chennai.

SAMPLE

The sample for the present study was who are having upper extremity paralysis after stroke in Apollo hospitals, Chennai.

SAMPLE SIZE

The sample size of the study was 60.

SAMPLING TECHNIQUE

Non Probability Purposive sampling technique was used for selecting the sample for the study.

INCLUSION CRITERIA

The study included

- Patients who were diagnosed to have stroke.
- Patients with upper extremity paralysis with stroke.
- Adult male and female patients.
- Patients who are willing to participate in the study.

EXCLUSION CRITERIA

The study excluded

- Patients who are very sick and unable to co-operate
- Patients with altered consciousness.
- Patients who underwent any surgery with in last 2 months
- Terminally ill patients.

SELECTION AND DEVELOPMENT OF RESEARCH TOOL

Section- A : Demographic variable proforma

Section- B : Clinical variable proforma

Section- C : Fugl-Meyer motor function assessment tool

Section- D : Satisfaction tool.

Section - A : Demographic Variable Proforma

This proforma was used by the researcher for collecting demographicvariables such as age, gender, occupation, educational status.

Section – B : Clinical Variable Proforma

In this study, Clinical variables includes, types of stroke, side affected withstroke, habits of smoking, alcohol and history of co-morbid illness.

Section – C : Fugl-Meyer Motor Function Assessment Tool

Fugl-Meyer motor assessment tool is a standardized tool. Totally 124 items, standardized tool of upper and lower extremities. Researcher used only some part of this tool that is 33 items to assess motor function of upper extremity as suggested by the author. This tool consisted of three responses such as none, partly performed and fully performed with scores ranging from 2 to 0, except item number 1 and 2. Hence the total obtainable score was 0-66. Item number 1 & 2 had 2 responses such as elicited and not elicited with scoring 0 and 2 respectively.

RESULTS

Table:1 Frequency and Percentage Distribution of Demographic Variables in the Control Group and the Experimental Group of Stroke Patients.

Demographic variables	Control group (n=30)		Experimental group (n=30)		p value	χ^2
	f	%	f	%		
Age in years						
<35 years	3	10	3	10		
36-50years	11	36.66	11	36.66	-	-
51-65years	7	23.33	7	23.33		
>65years	9	30	9	30		
Occupation						
Student	2	6.66	2	6.66		
Unemployed	0	0	1	3.33		
Employed	13	43.33	13	43.33	0.01	-
Home Maker	6	20	6	20		
Retired	9	30	9	30		
Educational status						
Illiterate	1	3.33	1	3.33		
Primary school	1	3.33	1	3.33		
High school	1	3.33	3	10	-	-
Higher secondary	10	33.33	8	26.66		
Graduate& above	7	23.33	17	56.66		

Note: Relevant categories were clubbed for the computation of chisquare analysis.

From the Table 1 inferred that 36.66 % of the patients were in the age group between 36-50 years and most of them were males (70%, 63.33%), 43.33% of them were employed in control group and in experimental group respectively. Findings also reveal that there was no statistically significant difference between the control group and the experimental group with regard to background characteristics of the patients such as age, gender, occupation, educational status indicating the homogeneity of the groups.

Figure : 1` Percentage Distribution of Gender for Control Group and Experimental Group of Stroke Patients.

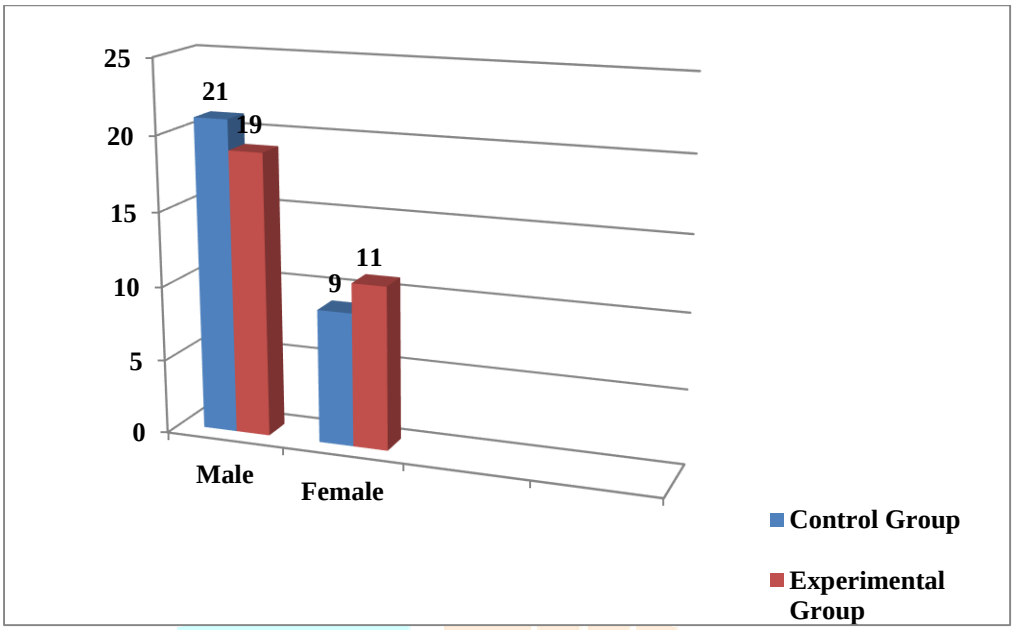

Table.2 Frequency and Percentage Distribution of Clinical Variables in the Controland the Experimental Group of Stroke Patients.

Clinical Variables	Control Group(n=30)		Experimental Group(n=30)	
	f	%	f	%
Affected limb				
Left upper limb	17	56.66	18	60
Right upper limb	13	43.33	12	40
Co-morbidities				
Absent	7	23.33	7	23.33
Hypertension	9	30	9	30
Coronary artery disease	6	20	8	26.66
Obesity	8	26.66	3	10
Any other	0	-	3	10
Duration of illness				
<1 month	8	26.66	9	30
1-4 months	10	33.33	8	26.66
5-8 months	5	16.66	8	26.66
Habit of smoking				
Yes	20	66.66	13	43.33
No	10	33.33	17	56.66
Habit of alcoholism				
Yes	9	30	13	43.33
No	21	70	17	56.66

Note: Relevant categories were clubbed for the computation of chi squareanalysis.

Table 2 revealed that most of the patients were diagnosed to have ischemicstroke (63%, 63.33%) with duration of illness 1-4 months (33.33%, 26.66%), smokers (66.66%, 43.33%) and 30%, 43.33% were alcoholics, 30 % , 30% hadco-morbid illness in the control group and the experimental group respectively.

Figure :2 Percentage Distribution of Types of Stroke in Control Group and Experimental Group.

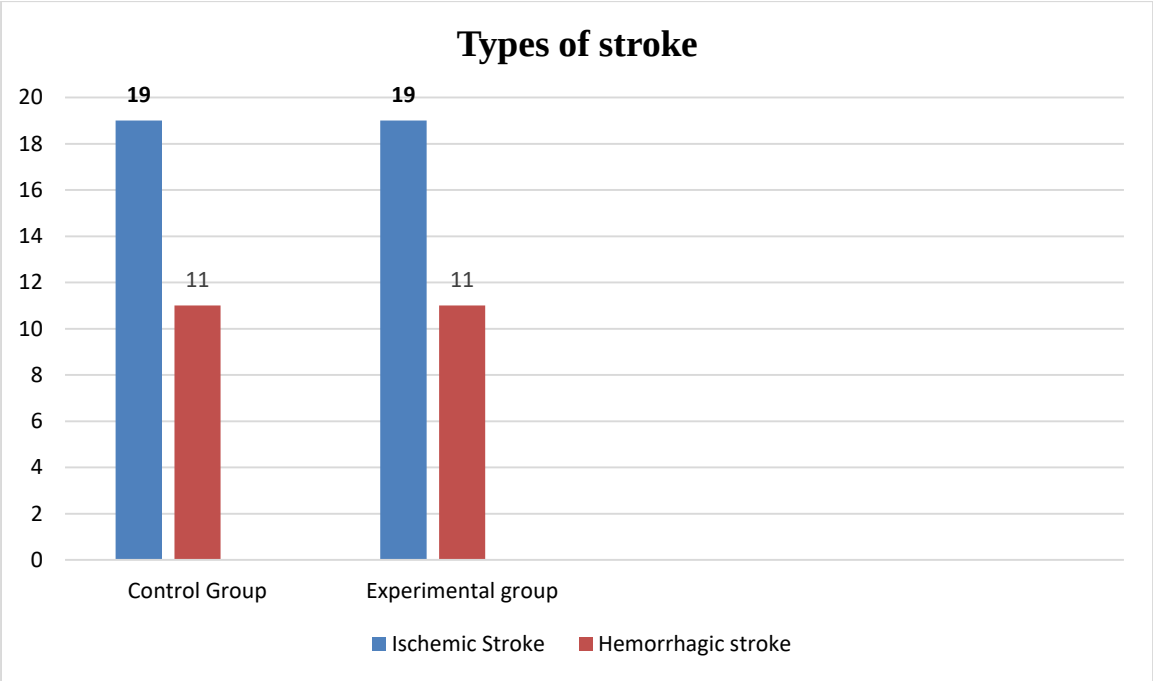

Table.3 Frequency and Percentage Distribution of Level of Motor Function of the Upper Extremity in the Control and the Experimental Group of Stroke Patients.

Level of Motor Function Upper Extremity	Control Group				Experimental Group			
	Pretest		Posttest		Pretest		Posttest	
	f	%	f	%	f	%	f	%
Not adequate (0-22)	30	100	30	100	29	96.66	22	73.33
Moderately adequate (23-44)	-	-	-	-	1	3.33	8	26.66
Adequate (45-66)	-	-	-	-	-	-	-	-

The data from the table 3 reveals that motor function of the upper extremity in the control group was not adequate (100%) in pretest and posttest whereas the motor function was moderately adequate in 26.66% of the patients during posttest in the experimental group.

Table.4 Comparison of Mean and Standard Deviation of Motor Function of Upper Extremity inthe Control and the Experimental Group of Stroke Patients.

Obtainable score		Control Group				Experimental Group			
		Mean	SD	MD	Paired t value	Mean	SD	MD	Paired t value
Pre test	0-66	16.03	3.36	0.77	0.79	16.26	4.99	3.54	**2.66****
Post test		16.8	4.18			19.8	5.33		

****p<0.01**

Data presented in the table 4 reveals that, there was no significant difference between pretest (M=16.03, SD=3.36) and posttest (M=16.8, SD=4.18) in motorfunction of upper extremity among stroke patients in the control group, whereas there was statistically significant difference between pretest (M=16.26, SD=4.99) and posttest (M=19.8, SD=5.33) in motor function of upper extremity among stroke patients in the experimental group at p<0.01 level.

Table: 5 Comparison of Mean and Standard Deviation of Motor Function of Upper Extremitybetween the Control Group and the Experimental Group of Stroke Patients.

Group	Pretest Mean	Pretest SD	Independent t value	Posttest Mean	Posttest SD	Independent t value
Control group (n=30)	16.03	3.36	0.21	16.8	4.18	**2.43***
Experimental group (n=30)	15.6	4.99		19.8	5.33	

***p<0.05**

Data presented in the table 5 reveals that, there was no statistically significant difference in the motor function of upper extremity pretest between the control group and theexperimental group, whereas there was significant difference in posttest between the control group (M=16.8, SD=4.18) and the experimental group (M=17.93, SD=5.99). The posttest motor function was higher in the experimental group than in the control group ($p<0.05$). Hence the hypothesis 1 was stating that there will be no significant difference in the motorfunction of upper extremity before and after mirror therapy in the control group and the experimental group of stroke patients was rejected.

Table. 6 Frequency and Percentage Distribution of Level of Satisfaction Scores Regarding Mirror Therapy in the Experimental Group of Stroke Patients.

Domain	Highly satisfied		Satisfied		Dissatisfied		Highly Dissatisfied	
	f	%	f	%	f	%	f	%
Demonstration of therapy	28	93.33	2	6.67	-	-	-	-
Effect of therapy	27	90.00	3	10.00	-	-	-	-
Approach of researcher	28	93.33	2	6.67	-	-	-	-

It can be inferred from table 6 inferred that majority of the patients undergoing mirror therapy in experimental group were highly satisfied with the demonstration of mirror therapy (93.33%), the effectiveness of therapy (90%) and the approach of researcher (93.33%).

DISCUSSION

A quasi experimental research design was adopted for the study. The study was carried out on 60 stroke Patients at Apollo Hospitals, Chennai. The effectiveness of mirror therapy was assessed by using observational checklist and rating scale after establishing validity and reliability. The main data collection was done after determining the feasibility and practicability through pilot study. The data was tabulated and analyzed by using descriptive and inferential statistics. Data reveals that, there was no significant differencebetween pretest (M=16.03, SD=3.36) and posttest (M=16.8, SD=4.18) in motorfunction of upper extremity among stroke patients in the control group, whereas there was statistically significant difference between pretest (M=16.26, SD=4.99) and posttest (M=19.8, SD=5.33) in motor function of upper extremity among stroke patients in the experimental group at $p<0.01$ level.

CONCLUSION

The present study concluded that mirror therapy was effective in improving the motor function of upper extremity among stroke patients. Majority of the patients receiving mirror therapies in experimental group were highly satisfied the effectiveness of therapy and approach of researcher.

REFERENCES

1) Kim, K. (2016). Effects of mirror therapy combined with motor tasks on upper extremity function and activities daily living of stroke patients. Journal of Physical Therapy Science, 28(2), 483–487

2) Mozaffarian, D. (2016). Heart Disease and Stroke Statistics—2016 update. Circulation, 133(4), e38-e360.

3) Polit, F. et al. (2016) Essentials of Nursing Research. (5th ed.). Philadelphia. J.B. Publishers. 36.

Mirela Cristina L. (2015) Mirror therapy enhances upper extremity motor recovery in stroke patients, Journal of Physical Therapy Science, 91(8), 689-700.

4) Kim, H., & Shim, J. (2015). Investigation of the effects of mirror therapy on the upper extremity functions of stroke patients using the manual function test. Journal of Physical Therapy Science, 27(1), 227–229.

5) Pollock, A. (2014) Interventions for improving upper limb function after stroke. Cochrane Database Systematic Review. Nov 12(11) CD010820.

6) Invernizzi, M. (2013). The value of adding mirror therapy for upper limb motor recovery of sub-acute stroke patients: a randomized controlled trial. European Journal of Physical Rehabilitation Medicine, 49(3), 311-317.

7) American Heart Association. (2013). Heart disease and Stroke Statistics. Retrieved from

http://www.strokesearch.org.

8) Lewis, (2011). Medical and surgical nursing. (7th ed.). Elsevier India private limited, publishers, 1466-1491.

9) Mahajan, B. K. (2010). Methods in Biostatistics. (7th ed.). St.Louis: Jaypee Brothers Medical publishers, 330-335.

10) Ezendam, D. (2009). Systematic review of the effectiveness of mirror therapy in upper extremity function. Journal of Disability and Rehabilitation, 31(26), 2135-2149.