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A study to assess the effect of mirror therapy on motor function of upper extremity among patient with stroke admitted at Sree mookambika institute of medical science, Kulasekharam

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Abstract
A stroke is a medical condition in which poor blood supply to the brain results in cell death. The day today lifestyle factors can increase the risk of stroke. Stroke can occur at any age. Common impairment after stroke like imbalance, sensory impairment, weakness, visual problems and lack of coordination will naturally increase the risk of falls and accidents. The study was adopted by quantitative approach with two group pretest and posttest quasi experimental design. The study was conducted among 40 clients admitted in Sree Mookambika Institute of Medical Science, Kulasekharam. The independent variable is Mirror therapy applied to stroke patients and dependent variable is motor function of upper extremity of stroke patient. The subject were selected by purposive sampling technique. 20 were allotted for experimental group and 20 were allotted for control group. For experimental group, the Mirror therapy was given with 4 set of exercise, 20 minutes every day for 4 weeks. Whereas control group received routine nursing care and conventional rehabilitation program. Post test was conducted after Mirror therapy in experimental and control group by using Wolf Motor Function Test Tool. Then study identified that the upper limb motor function was improved in experimental group. It was found that there was a significant improvement of upper limb motor function in experimental group after Mirror therapy than in control group. The't' value of mean 3.850. Mean difference 7.60. DF=38, $p \leq 0.001$. The researcher found that Mirror therapy is very effective intervention to improve upper limb motor function among stroke patients. It is a simple inexpensive, easy to practicable therapy and there is no side effect comparing with other pharmacological treatment.

Keywords: effect, mirror therapy, motor function, patient with stroke

Introduction
A non-communicable disease [NCD] is non-infectious health condition that does not disseminate itself to other people. The most common non communicable disease include cardiovascular diseases [such as heart attack and stroke], cancers, chronic respiratory disease and diabetes. One of the main risk factor of cardiovascular system is hypertension. Blood pressure that is not controlled may lead to stroke it weakens the blood vessels of the brain making them narrow and susceptible to damage. Stroke can affect the upper limb – shoulder, elbow, wrist and hand. Usually only one side of the body is affected.

Cardiovascular disease is the leading cause of death in the United States, responsible for 840,768 death [635,260 cardiac] in 2016. Every 40 seconds on average, an American will have a stroke. Developing countries like India are facing a double burden of communicable diseases. Stroke is one of the leading cause death and disability in India. The estimated adjusted prevalence rate of stroke range, 84-262/100,000 in rural and 334-424/100,000 based on the recent population based studies.

In stroke patient's hand function is decline in particular grip strength, often used results in increased difficulties in performing activities of daily living. Mirror therapy is a simple, inexpensive and, most importantly, patient directed treatment that may improve upper extremity function.

Mirror therapy is an intervention aimed at improving the functional movements of the paretic limb. It uses visual information to encourage patients to concentrate on the movements of their non-paretic limbs. Visual illusions make the patients feel as if their two hands are moving simultaneously and symmetrically. The visual illusions are activated in the cerebral hemisphere, and activation functions as the basis of a neurological mechanism for inducing brain plasticity.

Statement of the Problem
A study to assess the effect of Mirror therapy on motor function of upper extremity among patient with stroke admitted at Sree Mookambika Institute of Medical Science, Kulasekharam.

Objectives
The objectives of the study were
- To assess the motor function of upper extremity among patients with stroke before and after the implementation of Mirror therapy in control group and experimental group.
- To evaluate the effect of Mirror therapy on upper limb motor functions among patient with stroke.
- To associate the upper limb motor function with selected demographic variable and clinical variable of patient with stroke among experimental and control group.

Methodology
Research Approach
Research approach used for this study was Quantitative approach.

Research Design
The study has adopted of two group quasi-experimental pre-

test and post-test design.

Setting of the Study
The study was conducted in male and female medical wards of Sree Mookambika Institute of Medical Science, Kulasekharam, Kanyakumari dist.

Population
The population consists of patients diagnosed with stroke both male and female who are on rehabilitation phase between the age group of 40-95 years were admitting Sree Mookambika Institute of Medical Science, Kulasekharam who meets the inclusion criteria.

Sample size
Sample size consists of 40 patients (20 in control group and 20 in experimental group).

Sampling technique
Purposive sampling technique was used for selection of samples. The sample was selected based on the inclusion and exclusion criteria.

Criteria for selection of sample
Inclusion Criteria
Patients diagnosed with stroke and having decrease motor function.

- Patients who are willing to participate.
- Must have unaffected extremity.
- Tolerate upright position.

Exclusion criteria
Stroke patients, who are, Unconscious, quadriplegia, dementia- Below 40 and above 85.

Description of the Tool
Data collection tool consists of two sections

Section A_1
Demographic variables
Age, sex, Education, Religion, Marital status, Residence, occupation

Section A_2
Disease specific variables
Habits, dietary habits, history of chronic disease, family history of stroke, regular intake of medicine.

Section A_3
Clinical variable
Height, weight, BMI, vital signs- Temperature, Pulse, Respiration, Blood pressure.

Section B
Functional ability Scale: Wolf Motor Function Test Tool
In this section the upper motor function is assessed by Wolf function Test Tool. The scoring will be categorized as,
0 -Does not attempt with upper extremity [UE] being tested.

1. UE being tested does not participate functionally.
2. Does, but requires assistance of the UE not being tested for minor adjustments or change position, or require more than two attempts to complete, or accomplishes very slowly.
3. Does, but movement is influenced to some degree by synergy or is performed slowly or with effort.
4. Does, movement is close to normal, but slightly slower; may lack precision, fine coordination or fluidity.
5. Does, movement appears to be normal.

Reliability of the tool
The WMFT assessment tool is a standardized tool prepared by Morris DM. The tool possess a high inter rater reliability which was assessed among 24 subjects with chronic hemiplegia. The inter-rater reliability was examined using intra class correlation coefficient and internal consistency using Cronbach's alpha. The inter rater reliability was .97 or greater for performance and. 88 or greater for functional ability, internal consistency for test 1-was 0.92 for performance time and .92 for functional ability.

Data collection procedure
Data was collected in medical male and female wards of Sree Mookambika Medical Institute of Medical Sciences, after getting approval from the concerned authority in the month of February 2019. Oral consent was sought from the samples. The samples were selected by using purposive sampling technique. 40 samples were selected based on inclusion and exclusion criteria. First 20 samples are allotted for experimental group and next 20 samples are allotted for control group. Pretest was conducted to both experimental and control group by using Wolf Motor Function test tools. Mirror therapy was given with 4 set of exercise/5minutes [open the fist and close, touch the thumb to the tip of the each finger, turn the palm up and down, crawl the fingers along the Mirror in up and down directions] for 20 minutes per day for 4 weeks for experimental group along with conventional physiotherapy and the control group was given no intervention, they received conventional physiotherapy alone. Post test was conducted after intervention for both experimental and control group after 4 weeks using WMFT.

Section: A
This section displays the demographic variables of the subjects selected by the investigator.

Table 1: percentage Distribution of study subject according to demographic variables N= 40

S. No	Demographic variables	Control group		Experimental group		Total		χ^2
		f	%	f	%	f	%	
1	Age							
	40-60 yrs	10	50	10	50	20	50	6.9
	60-70 yrs	7	35	7	35	14	35	
	70-80 yrs	3	15	3	15	6	15	
	80-85yrs	0	0	0	0	0	0	
2	Gender							
	Male	10	50	11	55	21	53	1.45

	Female	10	50	9	45	19	48	
3	Education							
	Primary	1	5	4	20	5	13	20.56
	Middle	4	20	6	30	10	25	
	Higher secondary	10	50	5	25	15	38	
	Graduate	1	5	2	10	3	7.5	
	Illiterate	4	20	3	15	7	18	
4	Religion							
	Hindu	11	55	8	40	19	48	16.34
	Christian	9	45	11	55	20	50	
	Muslim	0	0	1	5	1	2.5	
5	Marital status							
	Married	20	100	19	95	39	98	1.34
	Unmarried	0	0	1	5	1	2.5	
6	Residence							
	Urban	12	60	12	60	24	60	1.89
	Rural	8	40	8	40	16	40	
7	Occupation							
	Sedentary workers	6	30	7	35	13	33	21.9
	Heavy workers	9	45	13	65	22	55	
	Unemployed	5	25	0	0	5	13	
8	Habits							
	Smoking	2	10	3	15	5	13	22.56
	Alcohol	4	20	3	15	7	18	
	Tobacco Chewing	0	0	1	5	1	2.5	
	Smoking & Alcohol	4	20	2	10	6	15	
	Smoking & Tobacco Chewing	1	5	1	5	2	5	
	Alcohol & Tobacco Chewing	0	0	0	0	0	0	
	Smoking, Alcohol & Tobacco Chewing	1	5	0	0	1	2.5	
	None of the above	8	40	10	50	18	45	
9	Dietary habits							
	Vegetarian	1	5	0	0	1	2.5	19.45
	Non Vegetarian	0	0	6	30	6	15	
	Both	19	95	14	70	33	83	
10	History of chronic disease							
	Diabetes mellitus	2	10	4	20	6	15	20.45
	Heart disease	3	15	2	10	5	13	
	Hypertension	3	10	7	35	10	25	
	Chronic kidney disease	0	0	1	5	1	2.5	
11	Family history of stroke							
	Yes	0	0	0	0	0	0	1.90
	No	20	100	20	100	40	100	
12	Regular intake of medicine							
	Yes	8	40	13	65	21	53	18.45
	No	12	60	7	35	19	48	
13	Clinical variable							
	BMI<18.5	0	0	0	0	0	0	15.23
	18.5-24.9	16	80	14	70	30	75	
	25.0-29.9	4	20	5	25	9	23	
	>30	0	0	1	5	1	2.5	
14	Temperature							
	Normal	20	100	20	100	40	100	1.9
	Abnormal	0	0	0	0	0	0	
15	Pulse rate							
	Normal	20	100	20	100	40	100	1.9
	Abnormal	0	0	0	0	0	0	
16	Respiration							
	Normal	20	100	20	100	40	100	1.9
	Abnormal	0	0	0	0	0	0	
17	Blood pressure							
	Normal	20	100	20	100	40	100	1.9
	Abnormal	0	0	0	0	0	0	

Section B

Table 2: Comparison of mean values between the experimental and control group in pre and post-test

Groups	Pre test		Post test		Mean difference	"t" test	df	Table value
	Mean	SD	Mean	SD				
Experimental group	22.30	6.91	29.10	6.97	6.80	20.526	39	3.31
Control group	19.50	5.67	21.50	5.41	2.00	21.86	39	3.36

Section C

Association between the upper limb motor function and selected demographic variables.

In this study there is an association between the occupations. Dietary habits, history of chronic disease and regular intake of medicine. So the research hypothesis [H2] was accepted.

Nursing Implication

Implication to nursing Administration

- The results encourages the nurse administrator to conduct in service education program on Mirror therapy for nurses which in turn helps for retaining and improving upper limb motor function among stroke patients.
- The nurse administrator can prepare the protocol regarding Mirror therapy and can frame policy so that Mirror therapy can be included as an add on along with conventional Rehabilitation Program.

Implication to nursing Education

- Mirror therapy can be added along with conventional Rehabilitation program for patients with stroke in the Medical surgical text books
- This research report can be kept in library for reference of nursing personnel and other health care professional.

Implication to nursing Practice

- Mirror therapy is a safe and better modality which has no side effects.
- It is one of the cost effective nursing intervention that can add benefits to patients who are an diagnosed with stroke. Implication to nursing Research:
- A comprehensive study can be done to determine the effectiveness in upper extremity motor function.

Implication to nursing Research

- A comprehensive study can be done to determine the effectiveness in upper extremity motor function among stroke patients with other alternative therapies.
- Similar study can be conducted on a large sample. So it could be generalizedunction among stroke patients with other alternative therapies.

Recommendations

- The study may be replicated with randomization in selection of a larger sample.
- Nurse researcher can do studies related to Mirror therapy.
- Nurse researcher can do studies comparing the immediate and long term effects of Mirror therapy in improve the upper limb motor function among stroke patient.

Conclusion

The conclusion drawn from the findings of the study are as follows

- Mirror therapy are found to be an effective nursing intervention in improving upper limb motor function among stroke patients.
- Mirror therapy are found to have no side effects when compared with other pharmacological therapies.
- Patient's satisfaction is significantly better in this procedure.

The findings of the study enlighten the fact that Mirror therapy can be used as a cost effective nursing intervention in improving upper limb motor function among stroke patients.

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