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EFFECTIVENESS OF PLANNED TEACHING PROGRAM ON EXERCISE-BASED REHABILITATION AMONG CARE GIVERS OF STROKE PATIENTS: A QUANTITATIVE PRE-TEST POST-TEST RESEARCH STUDY

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ABSTRACT **Introduction:** Stroke is a worldwide general illness and one of the main sources of morbidity, and mortality relative to cause negative outcome on the society. The study aim is to assess the effectiveness of planned teaching program on exercise-based rehabilitation among care givers of stroke patients admitted in selected hospital, Guwahati, Assam. **Materials and Methods:** A Pre-experimental one group pre-test post-test research design was utilized. Forty caregivers of stroke patients from Rahman Hospitals Pvt. Ltd. in Guwahati, Assam, were chosen using non-probability purposive sampling technique. Demographic questionnaire and observational checklists were used to assess the skills for exercise-based rehabilitation, namely tandem walking exercise and range of motion exercises and steps of skills were demonstrated. Descriptive and inferential statistical methods were used for data analysis. **Results:** The mean post-test skill score was 33.82 which was higher than the mean pre-test score which was found to be 10.30, with mean difference of 23.52. The calculated value (t=27.54 at df=39, p=0.001) and was statistically significant. And skill on Tandem walking exercise revealed that the mean post-test skill score was 8.45 which was higher than mean pre-test scores of 2.02 with mean difference of 6.43 with calculated value (t=21.62 at df=39, p=0.001) was statistically significant. For the association between pre-test skills scores on both exercise-based rehabilitation among care givers of stroke patients with their selected demographic variables were not found significant association at $p<0.05$ level. The study concluded that planned teaching program on exercise-based rehabilitation is effective among care givers of stroke patients. **Conclusion:** The study highlights that planned teaching program on exercise-based rehabilitation among care givers of stroke patients is effective. It is important for health practitioner to encourage care givers of stroke patient to adhere to the prescribed exercise-based rehabilitation.

KEYWORDS : Planned Teaching Program, Exercise-Based Rehabilitation, Stroke Patients, Care Givers.

1. INTRODUCTION

A stroke is characterized as a medical illness that develops quickly and is caused by signs of either localized or worldwide brain failure.[1] Stroke is the secondary source of mortality after cardiovascular disease, accounting for 5.5 million demise and 116.4 million Years of life lost and years lived with disability (YLDs) widely annually. Every year in India, 6,94,144 individuals pass away from strokes. Compared to developed nations, India has a greater annual incidence of acute stroke (AIS). Stroke-related disability-altering life years per 100,000 individuals are 2,229 in the northeastern Indian state of Assam, about twice as high as the 1,234 life years in all of India.[2]

When it comes to stroke patients, the caregiver's job is to help with ADLs, which include feeding, changing, caring for themselves, taking a bath, using the restroom, moving around, and some other movements. Along with managing the psychological, emotional, and physical issues that stroke survivors face, they also need to promote recovery and guard against more difficulties. If caregivers lack the necessary knowledge and abilities, they may find it challenging to provide care. From the moment of release, family caregivers are crucial to the patient's recovery from a stroke, especially when it comes to ongoing care at home. Family care is essential to the patient's rehabilitation. Prior investigations have demonstrated that stroke patients' excellent outcomes can be enhanced by their cares.[1]

Septianingrum Y, Subairi M. [2024] conducted literature review to examine the importance of Range of Motion (ROM) in Increasing Muscle Strength in Stroke Patients. Method use was PRISMA Approach. The research stage was to make selections by paying attention to the quality of the journal. Furthermore, articles from journals that considered less relevant were excluded. Literature obtained from 7 articles relevant to Google Scholar, Indonesia One Search, DOAJ, and Garuda with the keywords Range of Motion, Muscle Strength, Stroke. Literature review of selected articles result showed that Range of Motion have a good impact on increasing muscle strength in stroke patients. Study concluded that the Range of Motion (ROM) can be applied in health program for increasing muscle strength in stroke patient.[3]

Hosseini ZS, Peyrovi H, Gohari M. [2019] conducted a study to determine the effectiveness of passive range of motion exercise on motor function in acute phase stroke. The sample was divided into experimental group (n=33) and control group (n=19). The experimental group followed various exercises 6 to 8 times, 30 minutes each time, 2 days before admission. Muscle strength rating scale (Oxford scale) was used to compare before, during and after the intervention. Statistical analysis was performed using SPSS version 13.0 for Windows. The results of the study showed that the intervention in the experimental group in the acute stage improved the physical strength of the upper and lower limbs up to the first three months. In the control group, improvement in the upper limb muscles was observed only in the first and third months compared to control groups. This study concludes that early passive range of motion is recommended as part of the treatment of stroke patients.[4]

Islam M, Khandaker N, Rahman MS, Sultana A, Yasmin K, Dewan, et al.[2023] conducted a study to evaluate the efficacy of caregiver training in the rehabilitation of stroke survivors and compare rehabilitation interventions done by the therapist. Research design was quasi-experimental and sample size of 67 stroke survivors were divided into group A (home-based exercise by family caregivers; n=33) and group B (hospital-based supervised exercise by a physiotherapist; n=34). Family caregivers were trained according to the London Stroke Carers Training Course. And the functional independence measure (FIM) evaluated all patients after three months of physiotherapy. The result of the study was the mean age of the participants in group A and group B were 56.85 ± 11.49 and 58.65 ± 16.92 years, respectively, where most of the patients in both groups were male. Therapeutic approach provided by trained caregivers was found to be more effective and efficient than that done by a physiotherapist.[5]

Roy M, Bag R. [2019] conducted a study to determine the effectiveness of a rehabilitation program to educate caregivers of stroke patients. Pre-test post-test design was used and samples were collected by sampling method according to semi-structured interview. The model aims to provide 45-50 minutes of stroke treatment training and the post-test will be conducted 7 days after the intervention. The results of the study showed that the mean score of the knowledge post-test (14.7) was higher than the mean score of the pre-test (9.76). Understanding of stroke care among care givers has improved.[6]

All the above literature and studies showed that in India, occurrence of stroke is progressive than other developed nation and stroke patients are unable to perform daily activities of living due to decrease muscle flexibility, improper balance and gait. Nowadays, price of physical therapy is high and if the care givers of stroke patients learn the skills on exercise-based rehabilitation, it will reduce the burden of expenditure. So, investigator thinks that it is necessary to do further study of effectiveness of planned teaching program on exercise-based rehabilitation among care givers of stroke patients.

2. Methodology

The objectives of the study is to compare the skills on exercise-based rehabilitation among care givers before and after the implementation of planned teaching program and demonstration. Also to determine the association between the pretest skills scores on exercise-based rehabilitation with selected demographic variables among the care givers of stroke patients.

Research approach adopted for the study was evaluative research approach using pre-experimental one group pretest post-test design. The study was conducted in Rahman Hospitals Pvt. Ltd. Guwahati, Assam. A total of 40 care givers were selected by using non-probability purposive sampling technique. A formal approval was obtained from the authorities and ethical consent was obtained from the samples to conduct the study.

The tools developed and used for data collection were demographic proforma, observational checklist for assessment of skill on exercise-based rehabilitation (Range of motion exercise) and observational checklist for assessment of skill on exercise-based rehabilitation (Tandem walking exercise). Observational checklist for assessment of skill on exercise-based rehabilitation (Range of motion) contains 40 items which include skills on various range of motion exercise like flexion, extension, internal rotation, external rotation, hyperextension, circumduction and opposition. For each item 'Yes' and 'No' options were given. And for every 'Yes' remark one score and every 'No' remark zero score were given. Observational checklist for assessment of skill on exercise-based rehabilitation (Tandem walking exercise) comprises of 10 items with 'Yes' remark one score and 'No' remark zero score which include skills on various tandem walking exercise like stand up straight, close to a supporting wall or railing, keep head and chest upright, step one leg backwards reaching with big toe of another leg, etc. The tools were administered to 20 care givers of stroke patients and Karl's Pearson correlation coefficient formula was used to assess the Inter-Rater method reliability of both observational checklist for assessment of skill on exercise-based rehabilitation (Range of motion exercise) and observational checklist for assessment of skill on exercise-based rehabilitation (Tandem walking exercise). Result indicated that reliability was 0.95 and 0.9. Pilot study was conducted on 10 care givers of stroke patients and non-probability purposive sampling technique was used. The data was analyzed using both descriptive and inferential statistics.

3. RESULT

The majority of caregivers (30%) were 18-27 and 28-37 age groups. Majority of the care giver 23 (57%) were male. Regarding educational qualification, majority of care givers 15 (37.5%) were graduates and above. In regard to occupation, majority of the care givers 26 (65%) work in others.

Majority of the care givers 15 (37.5%) had others relation with the patient. Majority of the care givers 35 (87.5%) has no family history of stroke. Majority of care givers 22 (55%) had given care of hemorrhagic stroke. In terms of duration of patient's stay in hospital, majority of 24 caregivers (60%) have been there for around a week. Regarding experience in taking care of stroke patient, majority of 35 care givers (87%) had no experience in taking care of stroke patients.

Table 1: Frequency and Percentage Distribution of Care Givers of Stroke Patients with their Selected Demographic Variables. n=40

S. No	Demographic Variables	Frequency	Percentage (%)
1	Age in years		
	a. 18-27	15	37.5
	b. 28-37	15	37.5
	c. 38-47	10	25
2	Gender		
	a. Male	23	57.5
	a. Female	17	42.5
3	Education		
	a. Under 10th	4	10
	b. 10th pass	8	20
	c. 12th pass	13	32.5
	d. Graduate and others	15	37.5
4	Occupation		
	a. Unemployed	2	5
	b. Government service	4	10
	c. Private service	8	20
	d. Retired	0	0
	e. Others	26	65
5	Relation with the patient		
	a. Spouse	0	0
	b. Father	0	0
	c. Mother	0	0
	d. Son	14	35
	e. Daughter	11	27.5
	f. Others	15	37.5
6	Family history of stroke		
	a. Yes	5	12.5
	b. No	35	87.5
7	Type of stroke		
	a. Ischemic stroke	18	45
	b. Hemorrhagic stroke	22	55
	c. Transient stroke	0	0
	d. Cryptogenic stroke	0	0
8	Duration of patient's stay in hospital		
	a. 1 week	24	60
	b. 2 weeks	12	30
	c. 3 weeks	3	7.5
	d. 1 month and above	1	2.5
9	Experience in taking care of stroke patients.		
	a. No	35	87.5
	b. Yes	5	12.5

Table 2: Frequency and Percentage Distribution of Skill on Exercise Base Rehabilitation (Range of Motion Exercises) Among Care Givers of Stroke Patients n=40

Level of skill	Pre-test		Post-test	
	f	%	f	%
Inadequate	34	85	0	0
Moderate	6	15	0	0
Adequate	0	0	40	100

To determine level of skill on exercise-based rehabilitation (range of motion exercises) among care givers of stroke patients revealed that during pre-test majority 34(85%) had inadequate skill and 6(15%) had moderate skill where as in post-test all 40(100%) had adequate skill on range of motion exercise.

Table 3: Frequency and Percentage Distribution of Level of Skill of Exercise-based Rehabilitation (Tandem Walking Exercise) Among Care Givers of Stroke Patients n= 40

Level of skill	Pre-test		Post-test	
	f	%	f	%
Inadequate	35	87.5	0	0
Moderate	5	12.5	10	25
Adequate	0	0	30	75

To determine the level of skill on exercise-based rehabilitation (Tandem walking exercise) among care givers of stroke patients revealed that during pre-test majority 35(87.5%) had inadequate skill and 5(12.5%) had moderate skill where as in post-test maximum 30(75%) had adequate skill and 10(25%) had moderate skill on Tandem walking exercise.

Table 4: Effectiveness of Planned Teaching Program on Exercise-based Rehabilitation Among Care Givers of Stroke Patients. n=40

Skill	Pre-test		Post-test		Mean D	t value	df	p value
	Mean	SD	Mean	SD				
Range of motion Exercise	2.02	1.38	8.45	1.19	6.43	21.62	39	0.001*
Tandem Walking Exercise	10.30	4.49	33.82	3.14	23.52	27.54	39	0.001*

Significance at p<0.05, tabulated t-value for range of motion exercise= 3.56 and t-value for tandem walking exercise=3.56.

To determine the level of significance for skills, the paired t test was computed. Result on skill on range of motion exercise discuss that mean post-test skill score was found to be 33.82 which was higher than mean pre-test score i.e., 10.30. The mean pretest post-test difference was 23.52 with calculated value (t = 27.54 at df=39, p= 0.001) exhibited statistical significance. Findings on skill on Tandem walking exercise revealed that mean post-test skill score was found to be 8.45 which was higher than mean pre-test score i.e., 2.02. The mean pretest post-test difference was 6.43 with calculated value (t = 21.62 at df=39, p =0.001) was statistically significant.

Table 5. Association Between Pre-test Skill Score on Exercise-based Rehabilitation (Range of Motion Exercise) Among Care Givers of Stroke Patients with their Selected Demographic Variables. n=40

S. No	Demographic Variables	Pre-test Skills Range of motion exercise		χ2 value	df	p value
		Inadequate	Moderate			
1	Age in years			0.523	2	0.770
	a. 18-27	12	3			NS
	b. 28-37	13	2			
	c. 38-47	9	1			
2	Gender			1.928	1	0.165
	a. Male	18	5			NS
	b. Female	16	1			
3	Education			1.835	3	0.607
	a. Under 10th	3	1			NS
	b. 10th pass	7	1			
	c. 12th pass	10	3			
	d. Graduate and others	14	1			
4	Occupation			2.443	3	0.486
	a. Unemployed	2	0			NS
	b. Government service	3	1			
	c. Private service	8	0			
	d. Retired	--	--			
	e. Others	21	5			
5	Relation with the patient			3.996	2	0.136
	a. Spouse	–	–			NS
	b. Father	--	--			
	c. Mother	--	--			
	d. Son	10	4			
	e. Daughter	11	0			
	f. Others	13	2			
6	Family history of stroke			2.801	1	0.094
	a. Yes	3	2			NS
	b. No	31	4			
7	Type of stroke			0.071	1	0.789
	a. Ischemic stroke	15	3			NS
	b. Hemorrhagic stroke	19	3			
	c. Transient stroke	--	--			
	d. Cryptogenic stroke	--	--			
8	Duration of patient's stay in hospital			6.667	3	0.083
	a. 1 week	20	4			NS
	b. 2 weeks	11	1			
	c. 3 weeks	3	0			
	d. 1 month and above	0	1			
9	Experience in taking care of stroke patient			2.801	1	0.094
	a. No	3	2			NS
	b. Yes	31	4			

*p value < 0.05 level of significance NS- Non-Significant

The above table 5 represents association between pre-test skill score on exercise-based rehabilitation (range of motion exercise) among care givers of stroke patients with their selected demographic variables which was tested by using chi-square test. Result revealed demographic variables such as age, gender, education, occupation, relation with the patient, family history of stroke, type of stroke, duration of patient's stays in hospital and experience in taking care of stroke patients were not shown to be significantly association with pre-test skill score on exercise-based rehabilitation (range of motion exercise) at the p<0.05 level.

Table 6. Association Between Pre-test Skill Score on Exercise-based Rehabilitation (Tandem Walking Exercise) Among Care Givers of Stroke Patients with their Selected Demographic Variables. n=40

S. No	Demographic Variables	Pre-test skill Tandem walking exercise		χ2 value	df	p value
		Inadequate	Moderate			
1	Age in years			1.295	2	0.523
	a. 18-27	14	1			NS
	b. 28-37	12	3			
	c. 38-47	9	1			
2	Gender			0.716	1	0.397
	a. Male	21	2			NS
	b. Female	14	3			
3	Education			3.511	3	0.319
	a. Under 10th	3	1			NS
	b. 10th pass	8	0			
	c. 12th pass	10	3			
	d. Graduate and others	14	1			
4	Occupation			3.165	3	0.367
	a. Unemployed	1	1			NS
	b. Government service	4	0			
	c. Private service	7	1			
	d. Retired	--	--			
	e. Others	23	3			
5	Relation with the patient			0.792	2	0.704
	a. Spouse	–	–			NS
	b. Father	--	--			
	c. Mother	--	--			
	d. Son	13	1			
	e. Daughter	9	2			
	f. Others	13	2			
6	Family history of stroke			0.294	1	0.588
	a. Yes	4	1			NS
	b. No	31	4			
7	Type of stroke			2.828	2	0.093
	a. Ischemic stroke					NS
	b. Hemorrhagic stroke	14	4			
	c. Transient stroke	21	1			
	d. Cryptogenic stroke	--	--			
8	Duration of patient's stay in hospital			1.143	3	0.767
	a. 1 week	20	4			NS
	b. 2 weeks	11	1			
	c. 3 weeks	3	0			
	d. 1 month and above	1	0			
9	Experience in taking care of stroke patient			0.294	1	0.588
	a. No	4	1			NS
	b. Yes	31	4			

*p value < 0.05 level of significance NS- Non-Significant

The above table 6 represents association between pre-test level of skill on exercise-based rehabilitation (tandem walking exercise) among care givers of stroke patients with their selected demographic variables which was tested by using chi-square test. Result disclosed that demographic variables such as age, gender, education, occupation, relation with the patient, family history of stroke, type of stroke, duration of patient's stay in hospital and experience in taking care of stroke patients were not shown to be significantly association with pre-test skill score on exercise-based rehabilitation (tandem walking exercise) at the p<0.05 level.

4. DISCUSSION

The study reveals that planned teaching program on exercise-based rehabilitation among care givers of stroke patients was found effective.

The result is supported by intervention research conducted by Koujalagi DA, Chilapur VG, Natekar DS. [2021] to assess how well a training program for caregivers helps them treat stroke victims. A paired t test conducted after the training technique was implemented showed a significant difference in the caregivers of stroke patient's understanding of stroke treatment. [7]

The study also reveals that care giver's age, gender, education, occupation, relation with the patient, family history of stroke, type of stroke, duration of patient's stays in hospital and experience in taking care of stroke patients were not shown to be significantly association with pre-test skill score on exercise-based rehabilitation (for both range of motion exercise and tandem walking exercise).

5. CONCLUSION

From the finding of the present study, conclusion can be drawn that planned teaching program on exercise-based rehabilitation among care givers of stroke patients is effective.

6. Recommendation

The recommendations that follow are based on the experience gained during the study and the results.

- The study can be done in different setting.
- The study can be performed in large sample of care givers of stroke patients.
- A longitudinal study can be conducted to assess the effectiveness of planned teaching program on exercise-based rehabilitation among care givers of stroke patients.

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