

A Study to Evaluate the Effectiveness of a Structured Teaching Programme on Knowledge Regarding Physical-Based Rehabilitation to Restore Functional Mobility Among Patients with Stroke in a Selected Hospital at Mangaluru

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ABSTRACT

Background of the study: Stroke is the second leading cause of death globally and the third leading cause of premature death and disability (DALY-Disability Adjusted Life Years). Annually, 15 million people worldwide suffer from stroke, among these 5 million experience mortality and the other 5 million are left permanently disabled placing a burden on family and community. Rehabilitation is vital for minimizing adverse effects after stroke as it aims to reduce impairments and disabilities.

Objectives of the study: To assess the level of knowledge regarding physical-based rehabilitation to restore functional mobility among patients with stroke.

Materials and Methods: A quantitative research approach was adopted to evaluate the effectiveness of a structured teaching programme. The investigator selected the pre-experimental one group pre-test post-test design. A simple random sampling technique was used to select 60 patients diagnosed with stroke admitted in a specialized neuro hospital. The knowledge level regarding physical based rehabilitation

was assessed through a self-prepared semi-structured knowledge questionnaire by an interview method. A structured teaching programme regarding physical based rehabilitation was demonstrated and a booklet was distributed to the patients by the investigator. Post-test was conducted after a week using the same tool.

Results: In the pre-test, majority of 37 (62%) patients had inadequate knowledge, 20 (33%) had moderate knowledge and 3 (5%) of them had adequate knowledge. In the post-test, the majority of 35 (58%) patients had gained adequate knowledge and 19 (32) of them secured moderate knowledge and 6 (10%) patients attained inadequate knowledge. It was found that a demonstration session on physical based rehabilitation was useful for the patients diagnosed with stroke. The effectiveness of a structured teaching programme on knowledge regarding physical based rehabilitation was evaluated using paired "t" test and the obtained value was 20.64, which was greater than the table value at a $p < 0.05$ level of significance. Hence it was concluded that the structured teaching programme on knowledge regarding

physical based rehabilitation to restore functional mobility among patients diagnosed with stroke was effective.

Interpretation and conclusion: The study concluded that the post-test knowledge level among patients diagnosed with stroke was improved after the implementation of a structured teaching programme regarding selected physical exercises to restore functional mobility. Significant association was found with stage of illness and post-test knowledge ($P < 0.05$). The overall findings of the study showed that the structured teaching programme was effective in improving the knowledge regarding physical based rehabilitation to restore functional mobility among patients diagnosed with stroke.

Keywords: Effectiveness; structured teaching programme; physical based rehabilitation; patients diagnosed with stroke; functional mobility.

INTRODUCTION

The human mind is intriguing and close to the understanding of mankind and yet so far from real perception. The mind is the culprit behind all detrimental bodily actions and mental functions, and it also plays a major role in directing behavior.¹

The human brain is the "noble" organ, shrouded in the deepest of mysteries, highly organized masses of tissues properly hidden from man's prying eyes and curious fingers. The brain was not to be touched under any circumstances since this complex cerebral structure held the secrets of life and death and for that reason was sacred in the sight of God.² Brain consumes 20% of total oxygen, hence any disruption in blood flow alters neuronal tissue metabolism within 30 seconds, ceases metabolism within 2 minutes, and causes cellular death within 5 minutes. Thus, deterioration of brain cells develop stroke within a few minutes.³

WHO data 2022 reported that stroke is the second leading cause of death globally and the third leading cause of premature death

and disability (DALY-Disability Adjusted Life Years). Annually, 15 million people worldwide suffer from stroke, among these 5 million experience mortality, and the other 5 million are left permanently disabled even with sophisticated treatment, placing a burden on family and community.⁴

According to WSO (World Stroke Organization) data 2022, stroke has already reached epidemic proportions. Over 110 million people in the world are suffering from stroke today. Statistical data projected that globally one in 4 adults over the age of 25 may experience a stroke in lifetime.⁵

In India, the incidence rate of stroke is 119-145/per 100,000 due to the influence of increased prevalence of key modifiable risk factors (Hypertension, Atherosclerosis-CAD, etc.). The country has an estimated adjusted prevalence rate of stroke range, of 84-262/100,000 in rural and 334-424/100,000 in urban areas. Thus, stroke is becoming an important cause of premature death and disability in low and middle-income countries like India.⁶

In admission with cerebrovascular disorders, more than half of the patients present with moderate to severe motor deficit and their functional activities are often confined to the bedside or wheelchair. The most commonly occurring deficits are hemiparesis resulting in an immediate impairment of limb function, or the inability to stand, balance, and walk. Thus, facilitating the restoration of motor function and maximizing walking ability as early as possible plays a crucial role after a stroke.⁷

Rehabilitation is vital for minimizing sequelae after stroke, and patients who undergo continuous professional and systematic rehabilitation following the acute phase tend to recover rapidly. Various interventions can be applied for recovery, such as bilateral training, repetitive task training, constraint-induced movement therapy, electrical stimulation, robotic therapy, and exercise. Among these, exercise is crucial because it helps patients to return to activities of daily life by

restoring the function of impaired muscles, hence improving physical function. Exercise is also essential for preventing secondary complications, determining that continued exercise and physical activity after a stroke reduces the risk of recurrence of cardiovascular disease and mortality.⁸

Statement of the problem: “A study to evaluate the effectiveness of a structured teaching programme on knowledge regarding physical-based rehabilitation to restore functional mobility among patients with stroke in a selected hospital at Mangaluru.”

Objectives: To assess the level of knowledge regarding physical-based rehabilitation to restore functional mobility among patients with stroke.

To evaluate the effectiveness of a structured teaching programme on knowledge regarding physical-based rehabilitation to restore functional mobility among patients with stroke.

To find the association of knowledge regarding physical-based rehabilitation to restore functional mobility with socio-demographic variables like age, gender, religion, marital status, educational status, occupation, family income, type of family, residential area, personal habits, stage of illness, dietary pattern, BMI, type of stroke, source of information and co-morbid illness.

Hypotheses: All the hypotheses were tested at a 0.05 level of significance.

H1: There will be a significant difference between the pre and post-test knowledge scores on physical-based rehabilitation to restore functional mobility among patients with stroke.

H2: There will be a significant association between the post-test knowledge scores on physical-based rehabilitation to restore functional mobility with socio-demographic variables like age, gender, religion, marital status, educational status, occupation, family income, type of family, residential area, personal habits, stage of illness, dietary pattern, BMI, type of stroke, source of information and co-morbid illness.

METHODOLOGY

A pre-experimental one group pre-test-post-test study design was used to accomplish the stated objectives. The investigator selected 60 patients diagnosed with stroke who met the inclusion criteria using a consecutive sampling technique. The research tool was developed after doing extensive literature review. 7 experts such as neuro care nursing superintendent and professors of the medical surgical nursing department from different institutions provided their opinion and valuable suggestions which were considered and modified the tool accordingly. The final tool was prepared considering 16 items in socio-demographic variables and 30 items in the knowledge questionnaire regarding physical based rehabilitation to restore functional mobility among patients diagnosed with stroke. Component-1: Consists of 8 (26.6%) items related to general information on stroke, Component-2: Consists of 11 (36.6%) items related to general guidelines for physical-based rehabilitation, Component-3: consists of 11 (36.6%) items related to knowledge regarding physical-based rehabilitation. The maximum score was 30 and the minimum score was 0. The level of knowledge scores were classified as follows: adequate knowledge 21-30 score (>75%), moderate knowledge:11-20 score (50% -75%) and inadequate knowledge \leq 10 score (<50%). STP was developed by referring the books and journals. It contains information regarding meaning, risk factors and signs and symptoms of stroke with detailed information regarding physical based rehabilitation to restore functional mobility among patients diagnosed with stroke.

Inclusion criteria: Patients

- diagnosed with stroke between the age group of 30-75 years.
- who have other co-morbidities like diabetes mellitus, hypertension, kidney diseases, lung diseases, and other heart diseases.

- haemo-dynamically stable and able to practice physical-based rehabilitation.
- are willing to participate.
- understands the language Kannada and English.

Data collection procedure: Data collection procedure includes pretest, STP and post test. The data were collected by self prepared semi-structured knowledge questionnaire. After obtaining the formal permission from The Medical Director of First Neuro Hospital. The researcher approached Nursing Superintendent and selected 60 patients diagnosed with stroke by using consecutive sampling technique. Pre-test assessment of knowledge was done by an interview method. The socio-demographic performa and self-prepared semi-structured knowledge questionnaires regarding physical based rehabilitation was administered to collect the data. The need for the study and the objectives were explained to the patients. Anonymity and confidentiality were assured and written informed consent was obtained from the samples before conducting the pre-test. The investigator informed all the samples to answer all the questions given in the questionnaire and also assured that doubts in knowledge questionnaire will be clarified during STP. The investigator collected data from 50 patients diagnosed with stroke that took 45-60 minutes for each patient to complete the structured knowledge questionnaire.

Ethical consideration: Prior to the data collection, participants were informed about the study and written consent was obtained from each participant. Institutional human ethical committee clearance and permission was obtained to conduct the study.

Implementation of STP: After the pre-test, on the same day a structured teaching programme regarding physical-based rehabilitation which included physical exercises like wrist curl, hand and wrist stretch, shoulder opener, table towel slide, trunk bends, knee rotation, and hip abduction were demonstrated in the ward individually for 30 minutes after 15 minutes of warm-up exercises like head turns, palm stretches, shrugging shoulders, arm raises and arm crosses. Each exercise was repeated for 4 times which had 5-7 steps. An information booklet was distributed to each patient to practice physical exercises in home.

RESULTS

Analysis was performed by using descriptive and inferential statistics. Results were calculated by using P value < 0.05. Chi-square was used to associate the knowledge scores with selected demographic variables. Frequency and percentage distribution was used to analyze the demographic variables. Paired 't' test was used to find out the effectiveness of STP.

Table 1: Frequency distribution of Demographic characteristics N=60

Demographic characteristics		Frequency (No.)	Percentage (%)
Age in years	35-45	8	13
	46-55	13	22
	56-65	28	47
	66-75	11	18
Gender	Male	43	72
	Female	17	28
	Transgender	-	-
Religion	Hindu	27	45
	Muslim	26	43
	Christian	7	12
	Specify if any other	-	-
Marital status	Married	53	88
	Unmarried	-	-
	Widow/widower	1	2
	Separated/divorce	6	10

Table 1 continued...			
Education	No formal education	6	10
	Primary	24	40
	Secondary	21	35
	Graduate/post-graduate	9	15
Occupation	Unemployed	22	37
	Self-employed	-	-
	Employed	2	3
	Retired	36	60
Family income	≤ 5000 – 10000	-	-
	11000 to 20000	12	20
	21000 to 30000	42	70
	31000 to 40000	6	10
Residence	Urban	30	50
	Rural	18	30
	Semi-urban	8	13
	Semi-rural	4	7
Type of family	Nuclear	47	78
	Joint	13	22
	Extended	-	-
	Specify if any other	-	-
Personal habits	Alcohol	-	-
	Arecanut chewing	18	30
	Smoking	-	-
	Drug abuse	-	-
	No significant unhealthy habit	42	70
Stage of illness	Late sub-acute: 3-6 months	43	72
	Chronic: > 6 months	17	28
Food pattern	Vegetarian	-	-
	Non vegetarian	51	85
	Mixed	9	15
BMI	Underweight:<18.5	-	-
	Healthy weight: 18.5 – 24.9	14	23
	Overweight: 25.0–29.9	36	60
	Obesity: 30.0 and above	10	17
Type of stroke	Ischemic	46	77
	Hemorrhagic	14	23
Source of information	Media	24	40
	Newspaper	10	17
	Family	18	30
	Peer/neighbors	8	13
Co-morbidity	Hypertension	33	55
	Diabetes mellitus	18	30
	Coronary Artery Disease	9	15
	Disseminated Intravascular coagulation	-	-

Table 1 depicts majority of respondents 28(47%) were within the age group of 56-65 years, 43(72%) were males, 27(45%) were Hindu, 53(88%) were married samples, 24(40%) had completed primary education, 36(60%) were retired, 42(70%) were earning between RS. 21,000-30,000, 30(50%) were living in urban areas, 47(78%) belongs to the nuclear family, 42(70%) had no significant unhealthy habit, 43(72%) were with late sub-acute stroke, 51(85%) patients were non-vegetarian,

36(60%) were overweight, 46(77%) were with ischaemic stroke and 24 (40%) obtained information through media.

Table 2 reveals that in the pre-test, the majority of the patients 37(62%) had inadequate knowledge regarding physical-based rehabilitation, 20(33%) had moderate knowledge and 3(5%) had adequate knowledge regarding physical-based rehabilitation. Whereas, in the post- test 35(58%) had adequate knowledge regarding physical-based rehabilitation, 19 (32%) had

moderate knowledge and 6(10%) had inadequate knowledge regarding physical-based rehabilitation. Hence, it was concluded that there was an improvement in

knowledge regarding physical-based rehabilitation after the structured teaching programme among patients with stroke.

Table 2: Overall comparison of pre-test and post-test knowledge levels of patients diagnosed with stroke regarding physical-based rehabilitation. N=60

Level of knowledge	Pre-test		Post-test	
	Frequency(N)	Percentage (%)	Frequency(N)	Percentage (%)
Inadequate	37	62	6	10
Moderate	20	33	19	32
Adequate	3	5	35	58
Total	60	100	60	100

Table 3: Effectiveness of structured teaching programme on knowledge regarding physical based rehabilitation among patients diagnosed with stroke. N=60

Sr No.	Variables Mean	Mean percentage (%)	score	Standard deviation	Mean difference	Enhancement of mean score percentage (%)	't' value
1	Pre-test	9.86	33.56	5.29	10	26.44	20.64
2	Post-test	19.74	60	8.2			

Table 3 reveals that the pre-test mean score with standard deviation was 9.86 ± 5.29 and mean percentage score was 33.56% and the post-test mean score with standard deviation was 19.74 ± 5.45 and the mean percentage score was 60% whereas the mean percentage score difference was 26.44%. The obtained 't' value was 20.64 which was greater than the table value at $p < 0.05$ level of significance, after a structured teaching programme on physical-based rehabilitation.

Table 4 Association with the level of knowledge of patients and their selected demographic variables

Among the demographic variables analyzed in this study chi square value (χ^2) and P value showed that except for the stage of illness there was no association found between mean post- test score and the demographic characteristics such as age in years, gender, educational qualification, income per month, type of family, marital status, religion and place of residence.

Table 4: Association with the level of knowledge of patients and their selected demographic variables.

Variables	Adequate	Moderate	Inadequate	Df	'p' value	Chi-square value (χ^2)	Result
Age in years							
35-45	6	1	1				
46-55	8	4	1	6	0.05	3.68	NS
56-65	14	10	4				
66-75	7	4	0				
Gender							
Male	24	14	5				
Female	11	5	1	4	0.05	2.96	NS
Transgender	0	0	0				
Religion							
Hindu	16	8	3				
Muslim	14	10	2	6	0.05	3.12	NS
Christian	5	1	1				
Specify if any other	0	0	0				
Marital status							
Married	30	17	6				
Unmarried	0	0	0	6	0.05	1.26	NS
Widow/widower	1	0	0				
Separated/divorce	4	2	0				

Table 4 continued...

Table 4 continued...							
Education							
No formal education	6	0	0				
Primary	13	8	3	6	0.05	3.22	NS
Secondary	10	8	3				
Graduate/post-graduate	6	3	0				
Occupation							
Unemployed	14	6	2				
Self-employed	1	0	1	6	0.05	4.49	NS
Employed	0	0	0				
Retired	20	13	3				
Family income							
≤ 5000 – 10000	0	0	0				
11000 to 20000	7	5	0	6	0.05	3.10	NS
21000 to 30000	26	10	6				
31000 to 40000	2	4	0				
Residence							
Urban	16	11	3				
Rural	11	4	3	6	0.05	2.66	NS
Semi-urban	6	2	0				
Type of family							
Nuclear	28	14	5				
Joint	7	5	1	6	0.05	0.39	NS
Extended	0	0	0				
Specify if any other	0	0	0				
Personal habits							
Alcohol	0	0	0				
Areca nut chewing	14	2	2				
Smoking	0	0	0	8	0.05	7.09	NS
Drug abuse	0	0	0				
No significant unhealthy habits	21	17	4				
Stage of illness							
Late sub-acute: 3-6 months	25	16	2	2	0.05	8.29	S
Chronic: > 6 months	10	3	4				
Food pattern							
Vegetarian	0	0	0				
Non-vegetarian	28	17	6	4	0.05	2.96	NS
Mixed	7	2	0				
BMI							
Underweight: <18.5	0	0	0				
Healthy weight: 18.5 – 24.9	12	2	0	6	0.05	9.17	NS
Overweight: 25.0–29.9	17	15	4				
Obesity: 30.0 and above	6	2	2				
Type of stroke							
Ischemic	29	12	5	2	0.05	2.84	NS
Hemorrhagic	6	7	1				
Source of information							
Media	12	9	3				
Newspaper	7	3	0	6	0.05	10.54	NS
Family	8	7	3				
Peer/neighbours	7	1	0				
Co-morbidity							
Hypertension	20	10	3				
Diabetes mellitus	11	7	0	6	0.05	4.52	NS
Coronary Artery Disease	4	3	2				
Disseminated Intravascular coagulation	0	0	0				

DISCUSSION

Socio-demographic variables that depicts majority of respondents 28(47%) were within the age group of 56- 65 years,

43(72%) were males, 27(45%) were Hindu, 53(88%) were married samples, 24(40%) had completed primary education, 36(60%) were retired, 42(70%) were earning between

RS. 21,000-30,000, 30(50%) were living in urban areas, 47(78%) belongs to the nuclear family, 42 (70%) had no significant unhealthy habit, 43 (72%) were with late sub-acute stroke, 51 (85%) patients were non-vegetarian, 36(60%) were overweight, 46(77%) were with ischemic stroke and 24 (40%) obtained information through media. The pre-test of the present study showed that among 60 patients with stroke, 37(62%) of the samples had inadequate knowledge, 20(33%) had moderate knowledge and 3(5%) of them had adequate knowledge regarding physical-based rehabilitation.

The pre-test score was analyzed in 3 major areas and found that the mean and standard deviation regarding general information on stroke was 3.23 ± 1.54 with a mean score percentage of 40.40%. The mean and standard deviation for general guidelines of physical-based rehabilitation was 3.60 ± 1.73 with a mean score percentage of 32.73%. The mean and standard deviation for knowledge regarding physical-based rehabilitation was 3.03 ± 2.02 and the mean score percentage was 27.55%. The overall area-wise pre-test mean score with standard deviation was 9.86 ± 5.29 with a mean score percentage was 33.56%.

The post-test result reveals that among 60 patients with stroke, 35(58%) had adequate knowledge, 19(32%) had moderate knowledge and 6(10%) had inadequate knowledge after the administration of the structured teaching programme regarding physical-based rehabilitation.

The post-test knowledge was analyzed in major 3 areas and calculated the mean and standard deviation. Regarding general information on stroke, the mean score and standard deviation was 5.77 ± 1.60 with a mean score percentage of 52.452%. The mean score and standard deviation for general guidelines of physical-based rehabilitation was 7.30 ± 4.24 with a mean percentage score of 66.36%. For knowledge regarding physical-based rehabilitation, the mean score and standard deviation was 6.67 ± 2.36 and the mean percentage was

60.63%. The data indicated that the knowledge of the patient improved gradually after the administration of a structured teaching programme.

Concerning the overall pre-test and post-test scores, a significant enhancement was observed in the post-test mean and standard deviation of 19.74 ± 5.45 with a mean percentage score of 60% when compared to the pre-test. The mean difference of both the pre-test and post-test was 10. The improvement was enhanced to 26.44, indicating a significant improvement in knowledge level regarding physical-based rehabilitation.

The calculated "t" value was 20.64 which was greater than the table value at $p < 0.05$ level of significance. Therefore, the structured teaching programme regarding physical-based rehabilitation to improve functional mobility among patients with stroke was effective. The enhanced knowledge helps the patient to perform physical-based rehabilitation measures effectively to lead a healthy life. Hence, the research hypothesis H1 was accepted.

Limitations of the study

The study was limited to the patients:

- diagnosed with stroke between the age group of 30-75 years.
- who have other co-morbidities like diabetes mellitus, hypertension, kidney diseases, lung diseases, and other heart diseases.
- who are hemodynamically stable and able to practice physical-based rehabilitation.
- willing to participate.
- understands the language Kannada and English.

Recommendations:

Based on the present study findings it is recommended that;

1. A similar study can be conducted to find out the knowledge of patients regarding physical-based rehabilitation in a large group population which may help to

- draw a more definite conclusion and make a generalization.
2. A true experimental study can be conducted to evaluate the effectiveness of a structured teaching programme on knowledge regarding physical-based rehabilitation to restore functional mobility among patients diagnosed with stroke.
 3. A comparative study can be conducted to derive the inference regarding the impact of physical exercises on left and right hemiplegia.
 4. A comparative study can be conducted to differentiate the impact of physical-based rehabilitation among patients diagnosed with ischemic and hemorrhagic stroke.
 5. A similar study can be conducted to know the impact of physical therapy on other components such as ADL, cognitive ability, and upper and lower limb use.
 6. A study to evaluate the effectiveness of a structured teaching programme on knowledge regarding physical-based rehabilitation among patients diagnosed with a stroke can be conducted during the acute phase.
 7. A comparative study can be conducted to compare the impact of physical therapy with other forms of rehabilitation measures.
 8. An experimental study can be conducted to determine the improvement in knowledge and practice regarding physical-based rehabilitation.

CONCLUSION

The study aimed to evaluate the effectiveness of the structured teaching programme regarding physical-based rehabilitation to restore functional mobility among patients diagnosed with stroke. Teaching was given regarding physical-based rehabilitation which included selected physical exercises such as wrist curl, hand and wrist stretch, shoulder opener, table towel slide, trunk bends, knee rotation, and

hip abduction to restore functional mobility among patients diagnosed with stroke. The result was presented by using descriptive and inferential statistics.

The following conclusion was drawn based on the findings of the study.

The study finding revealed that the mean percentage and the standard deviation of post-test knowledge was 19.74 ± 8 , which was higher than the pre-test mean and standard deviation of 9.86 ± 5.29 . The enhancement score was 26.44% which shows that the mean post-test knowledge scores of the patients are significantly higher than their mean pre-test knowledge scores. The calculated “t” value was 20.64 which was greater than the table value at a 0.05 level of significance. The study concluded that a structured teaching programme regarding physical-based rehabilitation was effective and knowledge among patients regarding physical-based rehabilitation to restore functional mobility was increased from inadequate level to moderate and adequate level.

Declaration by Authors

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