Strategies of Daily Living Rehabilitative Activities for Post Stroke Patients at Minia University Hospital

Hend Elham Mohamed Zaky[1]*   Zienab Abd EL-Lateef Mohammad [2]
Abdou Saad Taha EL-Labban[3]   Gahen Ahmed[1]
1.Medical/Surgical Nursing, Faculty of Nursing, Minia University
2.Medical/Surgical Nursing, Faculty of Nursing, Assiut University
3.Rheumatology and Rehabilitation, Faculty of Medicine, Minia University
* E-mail of the corresponding author: hendelham@yahoo.com

Abstract

Back ground: Stroke is a leading cause of disability. Rehabilitation aims to hasten and maximize recovery from stroke by treating the disabilities caused by the stroke. Therefore, the aim of this study determine the post stroke patients' knowledge and practices in relation to disease and activities of daily living before the implementation of stroke rehabilitation and examine the effect of stroke rehabilitation on stroke patients' knowledge and practices in relation to disease and activities of daily living strategies. To fulfill the aim of these study three research hypotheses were formulated; Quasi-experimental research design was utilized to fulfill the aim of this study. The study sample included 60 male and female adult patients with stroke they were allocated randomly into two groups, study and control (30 patients each) the sitting Rheumatology and Rehabilitation Department at Minia University Hospital. Four tools were utilized for data collection; socio-demographic and medical data sheet, pre/post knowledge questionnaire interview schedule, Barthel index scale, Ashworth scale and Construction patient teaching booklet about stroke and activities of daily living performance. Before, immediate post test, after two month. Results of the study documented a significant improvement in knowledge and practices post strategies in study group in addition to reaching of an optimum level of independence for daily activities living and improvement degree of spasticity in study group more than control group, . In conclusion, education of stroke patient is necessary to achieve an optimum level of functioning. Replication of this study on larger probability sample is highly recommended.
Key words: Activities of Daily Living Strategies - Stroke- Patient's out comes

Introduction

Stroke defined according to National Institute of Neurologic Disorder and Stroke (NINDS) and the World Health Organization (WHO) as loss of the brain function related to inadequate cerebrovasculer blood flow more than 24 hour (Carison, 2009).

The stroke is leading causes of death and disability in many developed nations. In the United States, it is the third leading cause of death, after heart disease and cancer. There are approximately 750,000 cases of stroke each year and 160,000 are fatal. Approximately 4 million people in the United States have survived a brain attack and are living. Although stroke is considered a condition of elderly, stroke can happen to any one, 28% of their victims are under the age 65years. The annual cost of ischemic stroke is approximately $71.8 billon. The prevalence of stroke is almost twice as high for African Americans than Caucasians, and more men than women experience stroke. However, women account for approximately 60% of all stroke deaths. Stroke kills almost twice as many women as breast cancer (Osborn, et al., 2010).

In Upper Egypt, Abbas, et al., (2009) determine the characteristics of hospitalized stroke patients and case fatality Sohag, Quena and Aswan. We reported higher prevalence of hemorrhagic strokes reported in 37.5% of cases, 56 % were above 60 years. 8.6% are were juvenile events. 62% of stroke occurred in autumn-winter. Hemorrhagic stroke was higher in spring-summer (53%). Hypertension was the more frequent risk factor reported in 42% of patients.

Strokes can be classified into two major categories: ischemic and hemorrhagic. Ischemic strokes are those that are caused by interruption of the blood supply, while hemorrhagic strokes are the ones which result from rupture of a blood vessel or an abnormal vascular structure. About 85% of strokes are caused by ischemia while hemorrhagic stroke reprsents approximately 15% of all strokes (Donnan et al., 2008).

Risk factors can be divided into nonmodifiable and modifiable. Stroke risk increases with multiple risk factors. Nonmodifiable risk factors include age, gender, ethnicity/race, and family history/heredity. Stroke risk increases with age, doubling each decade after55 years of age. Two third of all strokes occur in individuals older than 65years, but stroke can occur at any age. Strokes are more common in men, but more woman die from stroke than men, because the woman tend to live longer than men; they have more opportunity to suffer a stroke (Lewis et al., 2011).

Modifiable risk factors are that can potentially be altered through lifestyle changes and medical

treatment, thus reducing the risk for stroke. Modifiable risk factors include hypertension, heart disease, smoking, excessive alcohol consumption, obesity, sleep apnea, metabolic syndrome, and lack of physical exercises, poor diet and drug abuse (Haley, 2010).

The warning signs of stroke are any of the following conditions that occur suddenly which need Immediate medical attention; sudden weakness and numbness of the face, arm or leg most often on one side of the body, sudden dimness or loss of vision, especially in one eye, loss of speech or difficulty understanding speech, sudden sever headache without known cause, unexplained unsteadiness, dizziness, or sudden falls, especially with one of other symptoms. Therefore, each person may have different stroke warning signs (Edlin and Golanty, 2010).

Asghar et al., (2009) stated that, Stroke survivors develop their own strategies to combat disabilities, as a making an appropriate strategy is an important step in improving life for many stroke survivors and may affect the success of rehabilitation and minimize the negative effects of recurrent stroke to the stroke patient. Participants valued better knowledge and skills regarding the adaptive strategies for stroke survivors are essential in accomplishing with activities of daily living and doing social roles for improving life after stroke. Also developing the socio- economic supports is crucial for assuring a more supportive approach to achieve rehabilitation services and design better educational program for them. Therefore, the present study has carried out in an attempt to investigate the impact of implementing strategies of daily living rehabilitative activities for post stroke patients at Minia University Hospital.

Significance of the study

Stroke is a condition with high incidence and mortality rates, leaving a large proportion of survivors with significant residual physical and psychological impairments. Through the previous 2 years from 2008 to 2010 inpatient hospital's recorded 255 patients come to rheumatology and rehabilitation department at Minia University Hospital. The increasing numbers of older adults for acute stroke suggest that will be an increase in the number of stroke survivors living with disabilities. This increased demands on rehabilitation efforts and services, making the issue of how to best limit stroke-related disability and health risks a major concern for healthcare providers. At this time efforts to prevent stroke must be balanced with the pragmatic effort to prevent disability and maximize quality of life for those who have suffered the consequences of stroke. So, this study will be carried out to investigate the impact of implementing strategies of daily living rehabilitative activities for post stroke patients at Minia University Hospital.

Subjects and Methods

Research design;

Quasi-experimental research design was utilized to meet the aim of the study.

Technical design

Setting of the study:

This study was carried out in Rheumatology and Rehabilitation Department at Minia University Hospital.

Subjects:

Inclusion & Exclusion criteria

Sixty convenient adult stroke patients and their age ranged between 20-64 years was selected according to the following criteria: patients with stroke who are free from sever cognitive, physical and communication impairment and study of comorbideties such as arthritis, diabetic neuropathy and musculoskeletal problem and didn't receive any program related to stroke rehabilitation. The patient will be divided randomly into two equal groups (study and control).

Study Tools: Data pertinent to the study were collected, utilizing four tools:
1- Pre/post test questionnaire sheet for the patient to assess their knowledge about stroke and activities of daily living after stroke disease in additional to sociodemographic and medical data sheet for patient.
2- Barthel index to assess activities of daily living performance.
3- Ashworth score to assess degree of spasticity.
4- Construction patient teaching booklet about stroke and activities of daily living performance.

Tools I – Interview questionnaire sheet:

Interview questionnaire sheet was constructed after reviewing the relevant literature (Carlson (2009), Kluwer (2009), Rodgers and Kowalski (2008) and Sole, et al., (2009) that was designed by the researcher to assess Patients' knowledge regard his disease. It was developed and translated into arabic language. The questionnaire sheet was administered by the researcher to the Patients' for answering all its components (pre/post tests

immediately and after 2 month) the total number of questions was 40.

Patient health needs assessment questionnaire concerning two parts:
- A. Sociodemographic and medical data sheet will be developed by the investigator and revised by supervisors, this covered the following:
- 1- Patient age, sex, occupation, education level, address and diagnosis.
- 2- Medical past history suffering from chronic disease such as (cardiovascular disease, diabetes mellitus and respiratory disease) and previous neurological disease such as if patients' history for cerebral infarction, cerebral hemorrhage, transient ischemic attacks, seizure and brain tumor.
- B. Patients' knowledge and practices regard his disease; this part covered the following information:
- 1- Patients' knowledge about concept of stroke, it was included 19 questions.
- 2- Patients' knowledge about activities of daily living performance after stroke disease, it was included 20 questions.

Scoring system for patients' knowledge was (39) degree, score of one was given for correct answer and a zero for incorrect answer.

Tool II: Activities of Daily Living (ADL) performance: This tool will be assessing by the Barthel index. It uses ten variables describing activities of daily living (Mobility (on level surfaces, Stairs, Transfers (bed to chair and back), Toilet use, Bladder, Bowels, Dressing, Grooming, Bathing and Feeding) were adopted from (Mahony and Barthel, 1965).
Scoring system, full credits have score (100) when patient not need minimal help or supervision during performance and physically independent, while a score of (75-90) is given when patient mildly disabled, subsequently a score of (50-70) is given when patient moderately disabled, while a score of (25-45) severely disabled and a score of (0-20) is given when patient very severely disabled and can not perform activities of daily living

Tool III: Clinical assessment of degree of spasticity according to Ashworth Score then stratification of the patient according to spasticity degree were adopted from (Ashworth, 1964).
Scoring system, no increase in muscle tone have score (0), while a score of (1) is given whenSlight increase in tone giving a "catch" when affected part is moved in flexion or extension, buta score of (2) is given when more marked increase in tone but affected part is easily flexed, subsequently a score of (3) is given when considerable increase in tone; passive movement difficult and a score of (4) is given when limb rigid in flexion or extension.

Tool IV- Educational and Training booklet was prepared by the researcher based on the knowledge and skills needs. It was also supplemented with information based on review of relevant literature (Carlson. (2009), Black and Hawks. (2009) and National Stroke Association. (2009) about stroke and activities of daily living for stroke patients' and the booklet was reviewed by supervisors.

Operational design:
Tools testing and pilot study:
A pilot study was carried out in November-December 2011 to test the tool. A pilot study was conducted for purpose to testing clarity, completeness, and validity, practicability of the study tools of (6) patients   to determine the time involvement. Also it was done to show the possibility and effectiveness of using the study tools. Necessary changes were carried out after completing the pilot study. Testing the questions were done to see if they are relevant and if they elicit the type of information, which are thought according to the answers and comments made by patients. The researcher modified some of the questions. Some details not required were omitted, either to advance or reduce the tool lengthy test. Also to show the possibility and the effectiveness of using the study tools regarding the policy of hospital.

Technique for data collection:
A structured interview was utilized to fill out the four tools.

Technique for data collection:
This study was carried out in two phases:

Phase I: Preparatory phase:
A review of current and local and international related to literature in a various aspects of the problems using

books, articles, periodicals and magazines was done. The proposed study settings were assessed for the number of patients suffering from stroke this phase ended by a pilot study.

Phase II: Implementation phase:

Once permission was granted to proceed with proposed study, the researcher initiated data collection. The study tools were carried out while the patients were done physiotherapy treatment. Each patient interview lasted for 30-45 minutes by using the direct observation technique; data were collected over a period of 12 months. At initial interview the researcher introduce her self to initiate line of communication, explain the nature & purpose of the study, prior to answering the questions to gain their oral consent & cooperation, and fill out the questionnaire sheet by patients individually. Monitoring the Barthel index and Ashworth scale was carried out while the patients were on take physiotherapy treatment (ultraviolet rays and rang of motion exercise). Each patient was observed by the researcher (pre educational Strategies and post immediately and after two month). The whole period for implementation of study was morning shift. The educational strategy was conducted through 6 sessions. The duration of each session ranged from 30-45 minutes. The first 2 sessions started by theoretical part about knowledge related to meaning of stroke, its signs and symptoms, Predisposing factors, types of medication use as treatment, complications and prevention the recurrent stroke. The later 4 sessions concerning the practical part about moving of hemparesis patient and exercise, how to wear clothes after disabilities, nutrition and elimination. Before beginning any sessions usually started by a summary of what has been taught during the previous sessions and the objectives of the new topics. The sessions were conducted by the researcher in a simple Arabic language utilizing the pre-determined teaching materials, Theoretical part; the teaching program was conducted through discussion, demonstration and redemonstration. Each patient was received the illustrated booklet as a hand out theoretical and practical content. An open channel of communication was achieved between the researcher and patients to assure understanding, answer any question and to verify information and practice. The effect of the educational strategies on patient's condition was reached through comparing patients achieved levels (scores or grades) before and after the application of the educational strategies (for knowledge about (stroke and activities of daily living for stroke patient) and could increase independency measured by Barthel index and assessment degree of spasticity according to Ashworth Scale testing form. compared study group with the control group.

Ethical and legal consideration:

Confidentiality and anonymity of patients was assured through coding of all data. Each patient has right to withdraw each from the study at any time without any rational.

Results

The aim of the present study is to:

1. Determine the post stroke patients' knowledge and practices in relation to disease and activities of daily living before the implementation of stroke rehabilitation
2. Examine the effect of stroke rehabilitation on stroke patients' knowledge and practices in relation to disease and activities of daily living strategies.

Research hypothesis

To fulfill the aim of the present study, the following research hypotheses are formulated:

1. Post stroke patients who are received post stroke rehabilitation (study group) are more knowledgeable about activities of daily living strategies than patients who not receiving activities of daily living strategies (control group).
2. Post stroke rehabilitation strategies enables stroke patients to participate in their management while in hospital regardless of whether or not they experienced the disease related to activities of daily living.
3. There is a relationship between degree of spasticity and performance of activities of daily living among both study &control group.

Result

The first part: Table (1) Socio-demographic characteristic of the studies group (control group and study group)

Socio-demographic characteristic	Control No(30)		Study No(30)		T. test	p. value
	No	%	No	%		
Sex						
Male	16	53.3%	14	46.7%	-0.509	0.613 Ns
Female	14	46.7%	16	53.3%		
Marital status						
Married	20	66.6%	17	56.6%	1.000	0.0001**
Widow	10	33.3%	13	43.3%		
Age						
< 20 years	2	6.7%	0	0.00%	0.222	0.825 Ns
21- 40years	4	13.3%	6	20.0%		
41- 50 years	6	20.0%	6	20.0%		
>51 to 64 years	18	60.0%	18	60.0%		
Mean ± SD	51.20±12.333		50.03±15.041			
Educational level						
Illiterate	26	86.7%	22	73.3%	1.350	0.182 Ns
Write and read	4	13.3%	4	13.3%		
Secondary	0	0.00%	2	6.7%		
Diploma	0	0.00%	2	6.7%		
Occupation						
Farmer	12	40.0%	6	20.0%	0.0001	1.000 Ns
Worker	4	13.3%	4	13.3%		
Housewife	14	46.7%	14	46.7%		
Retirement	0	0.00%	4	13.3%		
Employ	0	0.00%	2	6.7%		
Residence						
Urban	18	60.0%	22	73.3%	1.000	0.0001**
City	12	40.0%	8	26.7%		

Table (1) show that; socio-demographic characteristic of the studied group (control and study groups) as regarding to age the majority of both group aged between 51 to 64 years. Regarding to sex it was found that more than half of study group (53.3%) were female compared to (46.7%) in control group. It was found that, the highest percentages in both groups (study and control) were married, illiterate, house wife and live in urban area (56.6%,66.6%), (73.3%,86.7%), (46.7%) and (73.3%,60.0%) respectively.

Table (2) Distribution of medical data for both groups related to patients' past medical history

Variable	Control No(30)		Study No(30)		T. test	p. value
	No	%	No	%		
Previous hospitalization						
Yes	18	60.0%	20	66.7%	0.528	0.599Ns
No	12	40.0%	10	33.3%		
History of neurological disease						
Cerebral infarction	14	46.7%	2	6.7%		
Cerebral hemorrhage	2	6.7%	0	0.00%		
TIAS	0	0.00%	2	6.7%		
Cerebral infarction and TIAS	4	13.3%	2	6.7%	-0.627	0.533Ns
Infarction and hemorrhage	0	0.00%	2	6.7%		
Not found	10	33.3%	22	73.3%		
Time of previous neurological disease						
< one year	8	26.7%	4	13.3%		
2<5 years	12	40.0%	4	13.3%	-3.043	0.004**
Not found	10	33.3%	22	73.3%		
Stroke recurrence	20	66.7%	8	26.6%	-3.043	0.004**
Smoking						
Cigarette	14	46.7%	2	6.7%		
Water pipe	6	20.0%	6	20.0%		
Negative smoker	0	0.00%	14	46.7%	-1.255	0.215Ns
Non smoker	10	33.3%	8	26.6%		

Tables (2) show that; more than half of study group admitted to hospital in last years (66.7%) compared to control group (60.0%). The highest percentage of control group suffered from pervious cerebral infarction (46.7%) which occur in period 2<5 years (40.0%) while the majority of study group not suffered from pervious neurological disease (73.3%). More than half of control group suffered from stroke recurrence (66.7%) compared to 26.6%in study group. As regard to smoking the majority of study group were negative smoker (46.7%) and same percentage of control group were cigarette smoker (46.7%).

Table (3) Distribution percent of both groups related to current medical data

Variable	Control No(30)		Study No(30)		T. test	p. value
	No	%	No	%		
Causes of current stroke						
Cerebral infarction	24	80.0%	24	80.0%	0.0001	1.000 Ns
Cerebral hemorrhage	6	20.0%	6	20.0%		
Time of current stroke						
< 6 month	18	60.0%	24	80.0%		
7 month <1 year	8	26.7%	6	20.0%	2.184	0.033**
1 year to 2 years	4	13.3%	0	0.00%		
Physical disabilities from stroke						
Left side paresis	8	26.7%	12	40.0%		
Right side paresis	18	60.0%	18	60.0%	1.964	0.054*
Left side paralysis	2	6.7%	0	0.00%		
Right side paralysis	2	6.7%	0	0.00%		
Physical disabilities effect on dominant hand						
Yes	18	60.0%	22	73.3%	1.088	0.281 Ns
No	12	40.0%	8	26.7%		
Using assistive device						
Use cane	8	26.7%	4	13.3%		
Use wall	8	26.7%	12	40.0%	0.092	0.127 Ns
Support through sons	0	0.00%	8	26.7%		
Don't use	14	46.7%	6	20.0%		

That; the majority of both groups were having cerebral infarction (80.0%) which was developed within 6 month in study & control groups (80%, 60%) with affection on dominant hand in study& control group (73.3%, 60.0%). less than half from study group use wall as assistive device (40.0%) and in control group (46.7%) don't

use any assistive device.

Table (4) Distribution of medical data among both groups related to presence of chronic disease and risk factor for stroke

Variable	Control No(30)		Study No(30)	
	No	%	No	%
Hypertension	14	46.7%	16	53.3%
Hypotension	-	-	2	6.7%
Diabetesmellitus (DM)	10	33.3%	8	26.6%
Heart disease	2	6.7%	6	20.0%
Increased cholesterol level	4	13.3%	-	-
Genetics factors	4	13.3%	8	26.6%
Not found	10	33.3%	6	20.0%

Tables (4) show that; more than half of the study group were having hypertension (53.3%) compared to control group (46.7%). More than third of control group (33.3%) were having diabetes mellitus compared to (26.6%) in study group. In control group (33.3%) not suffered from chronic disease and (20.0%) in study group. As clear from the above table, both groups complain from more than one chronic disease in same time.

The first section related to hypotheses testing

Post stroke patients who are received post stroke rehabilitation (study group) are more knowledgeable about activities of daily living strategies than patients who not receiving activities of daily living strategies (control group).

Table (5): Mean and standard deviation of Patients' knowledge before application of strategy & post test I and post test II in both groups

Patients' knowledge		Study	Control	T. test	P. Value
		Mean ± SD	Mean ± SD		
Knowledge about concept of stroke	Pre test	0.9333 ±1.63861	0.9333±1.63861	0.0001	1.000 Ns
	Post test I	20.2667±2.27328	0.9333±1.63861	37.788	0.0001**
	Post test II	18.0667±3.05053	0.9333±1.63861	27.101	0.0001**
Knowledge about activities of daily living after stroke	Pre test	0.9333 ±1.63861	0.9333±1.63861	0.0001	1.000 Ns
	Post test I	29.333±2.53708	0.9333±1.63861	47.384	0.0001**
	Post test II	28.0000±2.28941	0.9333±1.63861	47.384	0.0001**
Total score of knowledge	Pre test	1.8667±2.51524	1.8667±2.51524	0.0001	1.000 Ns
	Post test I	49.6667±4.46699	1.8667±2.51524	51.071	0.0001**
	Post test II	46.0667±5.08502	1.8667±2.51524	42.674	0.0001**

Statistical significant difference (P < 0.05)

Table (5) show that; increase in total Patients' knowledge among study group after application of strategy (46.0667±5.08502) compared to (1.8667±2.51524) in control group with high statistical significant (0.0001).

The second section related to hypotheses testing

Table (6): Distribution of activities of daily living measured by Barthel index in pre, post I and post II for both group

Barthel index	Control Group						Study group						T test	P value
	Pre test		Post I		Post II		Pre test		Post I		Post II			
	No	%	No	%	No	%	No	%	No	%	No	%		
Very severely disabled	6	20	6	20	2	6.7	30	100	8	26.7	0	0	3.221	0.0001**
Severely disabled	20	66.7	20	66.7	22	73.3	0	0	12	40	8	26.7	3.521	0.0001**
Moderately disabled	4	13.3	4	13.3	6	20	0	0	10	33.3	14	46.7	3.751	0.0001**
Mildly disabled	-	-	-	-	-	-	-	-	-	-	8	26.7	-	-
Physical independent	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table (6) show that, increase in patients' performance activities of daily living measured by Barthel

index after application of strategy (post test II) than in pre test and post test I in study group than control group this appear through (8.9%) improved mildly disabled in study group while the highest degree of patients' activities of daily living performance is moderately disabled (6.7%).

The third section related to hypotheses testing
There is a relationship between degree of spasticity and performance of activities of daily living among both study &control group.

Table (7): Distribution of degree of spasticity according to Ashworth scale through pre, post I, post II in both group

Ashworth Scale (Lower extremities)	Study group						Control group						T test	P value
	Pre test		Post I test		Post- test II		Pre test		Post I test		Post- test II			
	No	%	No	%	No	%	No	%	No	%	No	%		
Hamstrings														
0	10	33.3	14	46.7	16	53.3	2	6.7	2	6.7	4	13.3	33.359	0.0001**
1	16	53.3	10	33.3	12	40	14	46.7	14	46.7	20	66.7		
2	2	6.7	4	13.3	2	6.7	10	33.3	10	33.3	6	20		
3	2	6.7	2	6.7	0	0	4	13.3	4	13.3	0	0		
Quadriceps														
0	14	46.7	14	46.7	16	53.3	2	6.7	2	6.7	4	13.3	35.972	0.0001**
1	10	33.3	10	33.3	12	40	14	46.7	14	46.7	22	73.4		
2	4	13.3	4	13.3	2	6.7	10	33.3	10	33.3	4	13.3		
3	2	6.7	2	6.7	0	0	4	13.3	4	13.3	0	0		
Gastrocnemius														
0	14	46.7	12	40	14	46.7	2	6.7	2	6.7	4	13.3	31.722	0.0001**
1	10	33.3	10	33.3	14	46.7	14	46.7	14	46.7	22	73.3		
2	4	13.3	6	20	2	6.7	10	33.3	10	33.3	2	6.7		
3	2	6.7	2	6.7	0	0	2	6.7	2	6.7	2	6.7		
4	0	0	0	0	0	0	2	6.7	2	6.7	0	0		
Soleus														
0	12	40	12	40	12	40	2	6.7	2	6.7	4	13.3	24.480	0.0001**
1	10	33.3	8	26.7	16	53.3	14	46.7	14	46.7	22	73.3		
2	6	20	8	26.7	2	6.7	10	33.3	10	33.3	2	6.7		
3	2	6.7	0	0	0	0	2	6.7	2	6.7	2	6.7		
4	0	0	2	6.7	0	0	2	6.7	2	6.7	0	0		
Hamstrings														
0	10	33.3	14	46.7	16	53.3	2	6.7	2	6.7	4	13.3	33.359	0.0001**
1	16	53.3	10	33.3	12	40	14	46.7	14	46.7	20	66.7		
2	2	6.7	4	13.3	2	6.7	10	33.3	10	33.3	6	20		
3	2	6.7	2	6.7	0	0	4	13.3	4	13.3	0	0		
Quadriceps														
0	14	46.7	14	46.7	16	53.3	2	6.7	2	6.7	4	13.3	35.972	0.0001**
1	10	33.3	10	33.3	12	40	14	46.7	14	46.7	22	73.4		
2	4	13.3	4	13.3	2	6.7	10	33.3	10	33.3	4	13.3		
3	2	6.7	2	6.7	0	0	4	13.3	4	13.3	0	0		
Gastrocnemius														
0	14	46.7	12	40	14	46.7	2	6.7	2	6.7	4	13.3	31.722	0.0001**
1	10	33.3	10	33.3	14	46.7	14	46.7	14	46.7	22	73.3		
2	4	13.3	6	20	2	6.7	10	33.3	10	33.3	2	6.7		
3	2	6.7	2	6.7	0	0	2	6.7	2	6.7	2	6.7		
4	0	0	0	0	0	0	2	6.7	2	6.7	0	0		
Soleus														
0[1]	12	40	12	40	12	40	2	6.7	2	6.7	4	13.3	24.480	0.0001**

[1] No increase in muscle tone

Ashworth Scale (Lower extremities)	Study group						Control group						T test	P value
	Pre test		Post I test		Post- test II		Pre test		Post I test		Post- test II			
	No	%	No	%	No	%	No	%	No	%	No	%		
1[1]	10	33.3	8	26.7	16	53.3	14	46.7	14	46.7	22	73.3		
2[2]	6	20	8	26.7	2	6.7	10	33.3	10	33.3	2	6.7		
3[3]	2	6.7	0	0	0	0	2	6.7	2	6.7	2	6.7		
4[4]	0	0	2	6.7	0	0	2	6.7	2	6.7	0	0		

Table (7) show that, the above table that there is decrease in patients' degree of spasticity according to Ashworth scale after application of strategy (post test II) less than in pre and post test I in study group than control group and improvement in lower extremities more than upper extremities and some patient suffered from flaccidity immediately after stroke and convert to increase intensity of muscle tone .

Discussion

The current study revealed that, more than half of study group (53.3%) were female compared to (46.7%) in control group this result supported with Seana et al, (2012) who recently reported that females had more severe strokes, higher short-term mortality, and different management in comparison to males.

The result of the present study revealed that, the majority of patients in both groups aged between 51 to 64 years, the highest percentages in both groups (study and control) were married, illiterate, house wife and live in urban area, this result agree with Zhaoqing et al, (2012) who stated that, the annual incidence of stroke and resulting mortality has increased at an accelerated rate. Furthermore, the incidence of stroke in rural China was higher than that found in urban China and Western countries.

The majority of study group were negative smoker (46.7%) and the highest percentage of control group were cigarette smoking (46.7%) this result agree with Carmona, (2010) with who mention that, smoking nearly doubles the risk for stroke. Smoking causes increased fibrinogen and platelet aggregation. The risk associate with smoking decreases substantially over time after the smoker quiets. After 5 to10 years of no tobacco used.

The current study revealed a great lack of patient's knowledge as regards to stroke pre the application of strategy in both study and control group. This finding could be attributed to lack of patient's education about how to deal with stroke disease and the highest percentages in both group illiterate, Judi and Valinda, (2012) reported that, use of structured education classes to facilitate the adaptation of stroke survivors who have returned to living in the community

More than 40 percent of stroke patients surveyed reported feeling only some what or not very successful in meeting their rehabilitation goals. Nearly the same percentage of respondents (38%) said they lack information on rehabilitation and recovery after stroke. Forty-three percent of the general public surveyed said they wouldn't help, or weren't sure if they would help, someone who had a stroke with daily activities such as food delivery (Russell, 2006).

After implementation of the strategy, patient's knowledge score level were significantly improved in study group but not changed in control group.

Joyce and Jane, (2009) reported that, education is the key to successful treatment of the disease, and the nurse plays a major role as patient educator. Patient and their families need accurate information about the disease and about strategies to minimize its impact. Effective education can alter behavior and empowering patient to make a positive change in their health status.

Public awareness has changed the outlook for stroke. No longer is stroke viewed as fatal or devastating. Education has broadened public knowledge about stroke. Education has taught the public that they have some control over their own health (Osborn, et al., 2010).

The result of the present study revealed increase in patients' activities of daily living measured by Barthel index after application of strategy (post test II) than in pre test and post test I in study group than control group. Debbie and Janice, (2012) mentioned that, Inpatient rehabilitation may enhance an individual's functional ability after stroke. Stroke patients demonstrated a significant increase in mobility function, and this was accompanied by an increase in daily walking.

Chao et al; (2012) mentioned that, Effects of different intensities of arm rehabilitation training on the functional recovery of hemiplegic upper extremity. An increase in the intensity of arm training might improve the motor function of the arm after stroke.

---

[1] Slight increase in tone giving a "catch" when affected part is moved in flexion or extension
[2] More marked increase in tone but affected part is easily flexed
[3] Considerable increase in tone; passive movement difficult
[4] Affected part is rigid in flexion or extension

Stroke is a major cause of long-term disability. About half of the patients surviving for three months after their stroke will be alive five years later, and one third will survive for 10 years. Approximately 60% of survivors are expected to recover independence with self-care, and 75% are expected to walk independently. It is estimated that 20% will require institutional care. The remainder will need assistance either by family. It is noteworthy that psychosocial disabilities (such as difficulties in socialization and vocational functions) are more common than physical disabilities (such as problems with mobility or activities of daily living) (Goldstein, 2006). Stroke represents one of the most costly and long-term disabling conditions in adulthood worldwide and there is a need to determine the effectiveness of rehabilitation programs in the late phase after stroke for which currently only limited scientific support exists. The general belief has been that treatment of individuals in the late phase of stroke is of no benefit. Today, the concept gives hope for improvements in rehabilitation that go beyond spontaneous recovery of function. The rehabilitation process should encompass all dimensions of a stroke survivor's life, and rehabilitation programs that address both the social and physical needs of the patients, preferably individually tailored, are therefore highly desirable. (Lina et al, 2012).

The current study revealed that, decrease in patients' degree of spasticity according to Ashworth scale after application of strategy (post test II) more than in pre test and post test I in study group higher than control group Yocheved and michal, (2011) reported that, Paretic muscle strength improved after training ($p < 0.05$) while tone remained consistent ($p > 0.87$). Gait velocity increased after training ($p < 0.05$) and at follow-up ($p < 0.05$). Changes in stair climbing were not significant ($p > 0.37$), although subjects perceived gains in their physical abilities at follow-up ($p < 0.01$).

As regard activities of daily living measured by Barthel index and correlation with knowledge, the result of the present study show that, after application of the strategy, positive statistical significant correlation (high knowledge high Barthel) while knowledge and Barthel index before application of strategy & post test I and post test II in control group had highest strong positive statistical significant correlation (less knowledge less Barthel index this based on score knowledge of control group).

Stefan et al; (2011) reported that, successful rehabilitation depends on systematic treatment by an interdisciplinary team of experienced specialists, can provide patients with the best functional results. In the area of functional restoration, there has been major progress in our understanding of the physiology of learning, relearning, and training. Further experimental and clinical studies will be needed to expand our knowledge and improve the efficacy of rehabilitation

As regard correlation of spasticity with activities of daily living after application of the strategy in study group, a highest strong negative statistical significant correlation was found in upper and lower extremities (Elbow, wrist, fingers, hamstrings, quadriceps, gastrocnemius, soleus) low of spasticity and high Barthel index based on table of percentage degree of spasticity and barthel while in control group after application of strategy had negative statistical significant correlation in lower extremities (hamstrings, gastrocnemius soleus) low of spasticity and high Barthel index due to progress on lower extremity more than upper and treatment of spasticity progress by use many modalities such as Electrical stimulation to the antagonist muscles or vibrations.

Anthony, (2012) mentioned that, spasticity is a common feature of the upper motor neuron syndrome following stroke. It can have a disabling effect on the stroke survivor through pain and reduced mobility, which may limit the potential success of rehabilitation. Spasticity can also affect quality of life (QoL) and can be both diverse and highly detrimental to daily functioning. Spasticity can result in urinary incontinence; limit sexual intimacy; interfere with walking, sitting, and standing; and generally reduce a person's ability to undertake activities of daily living ADLs.

Stroke is a major cause of chronic impaired arm function and may affect many activities of daily living. At hospital admission after stroke more than two-thirds of all patients have arm paresis, resulting in reduced upper extremity function and six months after stroke the affected arm of approximately half of all patients remains without function. Therefore, to reduce this burden, many patients receive a multidisciplinary rehabilitation approach soon after stroke. Thus, there still exists an urgent need for new inpatient and outpatient rehabilitation and training strategies that match the specific needs of patients and their relatives (Mehrholz et al; 2012).

A recent study examined 103 patients at 6 days, 6 weeks, and 16 weeks post-stroke for change in muscle tone, pain, and paresis. Within 2 weeks of stroke, 24.5% of patients developed an increase in muscle tone according to the Modified Ashworth Scale. By the first follow-up (median time = 6 weeks after baseline measurements were recorded), spasticity had emerged in 98% of patients diagnosed with spasticity throughout the course of the study, and the rate of spasticity at first follow-up had increased only slightly, up to 26.7%. Other predictive factors include a low Barthel Index score (indicating severe disability) at baseline and paresis at any point throughout the study. a history of smoking and all other baseline factors such as sex and age were not associated with severe spasticity. They also had experienced early arm or leg weakness (Wissel et al, 2010).

Despite significant improvements in paretic hand function, no increase in daily use of the paretic or no paretic hand. A disparity between functional recovery and increases in daily use of the upper and lower

extremities was found during inpatient stroke rehabilitation (Debbie and Janice, 2012).

Sensory stimulation via TENS may be beneficial to enhance aspects of motor recovery following a stroke, particularly when used in combination with active training. Because of the great variability between studies, particularly in terms of the timing of the intervention after the stroke, the outcome measures used, and the stimulation protocols, insufficient data are available to provide guidelines about strategies and efficacy (Yocheved and michal, 2011).

Conclusion

Based on results of the present study the following can be concluded:
- Lack patient's knowledge regarding stroke in both study& control group before application of strategy.
- Application of educational strategy for patient with stroke showed an improvement in patients' knowledge in study group. An improvement of patient's knowledge could reflect an improvement on patient's outcomes.
- Improvement of patient performing activities of daily (measured by Barthel index) in study group than control group and after than before strategy.
- Decrease patient degree of spasticity (measured by Ashworth scale) which may also help in improvement on patient's activities of daily.

Recommendation

Based on results of the present study the following can be recommended:

For patients'
- A continuous educational and training program planned and offered on regular basis to stroke patients in the Rheumatology and Rehabilitation unit.
- Written, simple booklet about stroke and its management should be provided & available for patients and their families (relatives)

For further study and research:
- Replication of the current study on larger probability sample is recommended to achieve generalize ability and wider utilization of the designed program.
- Establish an effective training program on nursing intervention of post stroke patients' rehabilitation, should be well organized and equipped with necessary educational facilities for nurses.

References

Abbas MN, Fawi1 F, Corea MA, Thabit G and Comi. (2009): Southern Egypt Stroke Study: Case Fatality Rates in a Hospital-Based Setting General and Internal Medicine Journal,40-46.

Anthony BW. (2012): Literature Review of the Pathophysiology and Onset of Post Stroke Spasticity, European Journal of Neurology, 19, 21-27.

Asghar D, Sirkka LE, Seyed BM, Hamid RK and Kristiina H. (2009): Post Stroke Life in Iranian People: Used and Recommended Strategies Iranian, Rehabilitation Journal, 17-24.

Ashworth B. (1964): Preliminary trial of carisoprodol in multiple sclerosis. Practitioner, 540-542.

Black JM and Hawks JH. (2009): Medical - Surgical Nursing (Clinical Management for Positive Outcomes). Saunders company, 8th ed., 1844- 1867.

Carison KK. (2009): AACN Advanced Critical Care Nursing, American Association Critical Care Nurses Saunders 1st ed., 576-316.

Carmona R. (2010): The Health Consequence of Smoking; a Report of the Surgeon General, Medicine Journal, 12, 22.

Chao H, Qiang W, Ping PM, Ming-zhu Q. (2012): Effects of intensity of Arm Training on Hemiplegic Upper Extremity Motor Recovery in Stroke Patients: a Randomized Controlled Trial Clinical Rehabilitation, Rehabilitation Journal, 16,122-128.

Debbie R and Janice JE. (2012): Disparity between Functional Recovery and Daily Use of the Upper and Lower Extremities during Subacute Stroke Rehabilitation , Neurorehabil Neural Repair January, 26, 76-84.

Donnan GA, Fisher M, Macleod M and Davis SM. (2008): "Stroke", Neurology Journal,12, 161-223.

Edlin G and golanty E. (2010)|: health and wellness Jone and Bartlett publishers 10th ed., 330.

Goldstein LB. (2006): Primary Prevention of Ischemic Stroke: a Guideline from the American Heart Association Stroke Council, American Stroke Association, 37, 1583.

Haley WE, Roth DL, Howard G. (2010): Caregiving Strain and Estimated Risk for Stroke and Coronary Heart Disease among Spouse Caregiver Differential Effects by Race and Sex, Stroke Journal, 41, 331.

Joyce B, and Jane H. (2009): Medical Surgical Nursing. Congress, 8th ed., 474.

Judi J and Valinda P. (2012): The Effects of a Structured Education Course on Stroke Survivors Living in the Community, Rehabilitation Nursing Journal, 25, 59-65.

Kluwer W. (2009): Evidence Based Nursing Guide to Disease Management Lippincott Williams and Wilkins, 1st ed., 143-156.

Lewis SM, Heitkemper MM, and Dirksen SR and Bucher L. (2011): Medical Surgical Nursing. Assesment and Management of Clinical problems Mosby, 10th ed., 788-1525

Lina BK, Asa LN, Christian B and Michael N. (2012): The Effects of a Rhythm and Music-Based Therapy Program and Therapeutic Riding in Late Recovery Phase following Stroke: a Study Protocol for a Three-armed Randomized Controlled Trial, BMC Neurology journals, 141, 1471- 2377.

Mahoney FI and Barthel D. (1965): Functional Evaluation: the Barthel Index, Maryland State Med Journal, 14, 56-61.

Mehrholz J, Hädrich A, Platz T, Kugler J and Pohl M (2012): Electromechanical and robot-assisted arm training for improving generic activities of daily living, arm function, and arm muscle strength after stroke (Review), PubMed Journal, 27, 1-52

National Stroke Association. (2009): Stroke Rehabilitation.

Osborn KS, Wraa CE and Waston AB. (2010): Medical Surgical Nursing (preparation for practice) pearson 1st ed., 757-761.

Rodgers CB and Kowalski MT. (2008): Text Book of Basic Nursing Lippincott company 9th ed., 1241-1245.

Russell. (2006): Lack of Adequate Post-Stroke Care Unveiled New Survey Finds the "Forgotten Stroke Survivors" Are Not Receiving Enough Information about Rehabilitation Options, National Stroke Association Journal, 4, 12-35.

Seana LG, Pham LT, Kara M, Leigh B and Velandai S. (2012): Sex Differences in Long-Term Outcomes After Stroke Functional Outcomes, Handicap, and Quality of Life, American Heart Stroke Association Journal, 8, 1982-1987.

Sole ML, Klein DG, and Moseley MJ. (2009): Introduction to Critical Care Nursing. Saunders Company, 5th ed., 410-420.

Stefan K, Stefan H and Peter O. (2011): Rehabilitation after Stroke, Neurologische Rehabilitation Journal, 108, 600-606.

Wissel J, Schelosky LD, Scott J, Christe W, Faiss JH and Mueller J. (2010): Early development of spasticity following stroke: a prospective, observational tria, Neurology Journal, 257, 1067-1072.

Yocheved L and Michal EG. (2011): Does Sensory Transcutaneous Electrical Stimulation Enhance Motor Recovery Following a Stroke? A Systematic Review. Neuro rehabilitation Journal, 25, 799-809

Zhaoqing S, Liqiang Z, Robert D, Xingang Z, Jue L, Dayi H and Yingxian S. (2013): An Epidemiological Survey of Stroke among Rural Chinese Adults Results from the Liaoning Province, International Journal of Stroke, 44, 1500-1504.

The IISTE is a pioneer in the Open-Access hosting service and academic event management. The aim of the firm is Accelerating Global Knowledge Sharing.

More information about the firm can be found on the homepage:
http://www.iiste.org

CALL FOR JOURNAL PAPERS

There are more than 30 peer-reviewed academic journals hosted under the hosting platform.

Prospective authors of journals can find the submission instruction on the following page: http://www.iiste.org/journals/   All the journals articles are available online to the readers all over the world without financial, legal, or technical barriers other than those inseparable from gaining access to the internet itself. Paper version of the journals is also available upon request of readers and authors.

MORE RESOURCES

Book publication information: http://www.iiste.org/book/

Academic conference: http://www.iiste.org/conference/upcoming-conferences-call-for-paper/

IISTE Knowledge Sharing Partners

EBSCO, Index Copernicus, Ulrich's Periodicals Directory, JournalTOCS, PKP Open Archives Harvester, Bielefeld Academic Search Engine, Elektronische Zeitschriftenbibliothek EZB, Open J-Gate, OCLC WorldCat, Universe Digtial Library , NewJour, Google Scholar