

Effect of Nursing Intervention for Cognitive Rehabilitation among Elderly patients with Stroke at Assiut University Hospital

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Abstract

Cognitive impairment is a frequent consequence of stroke, *The study aimed* to measure effect nursing intervention on cognitive rehabilitation of elderly patients with stroke for improving their cognitive function , Quasi experimental research design were used in this study. It conducted at neuropsychiatric, physical medicine and rehabilitation departments and outpatient neurology clinics at Assiut University hospital. Convenient sample of elderly patients attending to the previous setting were included in this study during a period of one year from September 2011 to September 2012, their number were 75 elderly stroke patients aged 60 years and above, (study group, 35, control group, 35) . Six tools were utilized ,tool I: Socio- demographic characteristics and questions about stroke tool II: Mini-Mental State Examination tool III: Digit Span tool IV: Logical memory tool V: Geriatric Depression Scale. Tool VI: Barthel Index scale. The main result of the present study revealed that a significant statistical difference was existed between both studied groups in relation to Min Mental State Examination (P-value = 0.000*). **Conclusion:** Application of training program about cognitive impairment of stroke elderly patients have significant therapeutic effect on cognitive function, and on activities of daily living. **Recommendation:** Routine use of screening assessment of cognitive impairment in every stroke patient for early detection, and Health education to the elderly patients and caregivers about the possible ways of prevention of recurrent stroke and ways for controlling of diabetes and hypertension

Key words: *Cognitive rehabilitation, Elderly, Stroke patients.*

Introduction

Stroke is the third leading cause of death and the leading cause of disability in the United States. Approximately 600,000 strokes, or brain attacks, occur in the United States each year and of these, approximately 150,000 (25%) are fatal. (Stanley & Swierzewski, 2007). According to the latest WHO data published in April 2011 Stroke deaths in Egypt reached 52,166 or 14.37% of total deaths, (WHO, 2011) .

Stroke risk factors include: Personal or family history of stroke, heart attack or Transient Ischemic Attack (TIA), being age 55 or older, high blood pressure, high cholesterol level above 200 milligrams per deciliter (mg/dL), cigarette smoking or exposure to secondhand smoke, diabetes, being overweight (body mass index of 25 to 29) or obese (body mass index of 30 or higher), physical inactivity, and cardiovascular disease, (Donnan, *etal*, 2008& *Stroke Association – 2013*).

Stroke patients often experience cognitive dysfunctions. Different sources indicate that cognitive dysfunction and dementia are present in 16.8–31.8% of stroke patients. Such disorder may range from slight memory impairment or temporal

orientation impairment to severe cognitive impairment, (Alladi, *et al.*, 2002).

Strokes may best be prevented by implementing nursing interventions to reduce risk factors, such as obesity and hypertension. Diet and nutritional management, exercise, and weight reduction are primary prevention strategies that have been effective in reducing the risk of stroke, (Wallace, 2008).

Cognitive rehabilitation offers retraining in the ability to think, use judgment, and make decisions. The focus is on correcting deficits in memory, concentration and attention, perception, learning, planning, sequencing, and judgment, (Nair & Lincoln, 2007). In addition to speech therapy, occupational therapy, physical therapy, psychotherapy, and medication, stroke survivors may greatly benefit from Cognitive Rehabilitation (CR) treatment to decrease their cognitive deficits, (Canadian Stroke Network 2009).

Significance of the study

According to the World Health Organization, About 15 million people have a stroke worldwide annually. Five million of survivors are left permanently disabled, (WHO, 2009), with complications including motor (50–83%), cognitive (50%),

language impairments (23–36%), and psychological disturbances (20%), (Paul, et al 2007). By 2020, it is projected that there will be 25 million deaths annually from Cerebro Vascular Disorder (CVD) worldwide, with 19million in populations from developing countries. Over 65% of stroke deaths are reported from developing countries, (Bonita, et al, 2004& Feigin, 2005).The significance of continued rehabilitation following a stroke can make the difference in a full or partial recovery. Recent studies show that rehabilitation is responsible for more than 70% of the recovery process.

Aim of the study

To measure the effect of nursing intervention on cognitive rehabilitation of elderly patients for improving their cognitive function.

Research hypotheses

1. There will be improvement in cognitive function and activities of daily living for study group (group1) after application of nursing intervention.

Subject and Methods

Research Design:

Quasi experimental research design was used in this study.

I-Setting

The study was carried out at three setting; Neuropsychiatric, physical medicine and rehabilitation departments and outpatient neurology clinics at Assiut University hospital (The cause for choosing this hospital only because there was a rehabilitation center and patients from other places come to her).

Sampling

Convenient sample of elderly people attending to the previous setting were included in this study, their number were 75 elderly person aged 60years and above (five of them were pilot study). They randomly assigned into one of two group, group I used as study group (35 elderly post stroke patients) and group II used as a control group(35 elderly post stroke patients) using closed envelop.

Inclusion criteria

1. Elderly stroke patients aged 60 years and above
2. History of post stroke dementia(Ischemic or hemorrhagic) (chronic stroke) according to Mini-Mental State Examination.
3. Stable medical status enabling active rehabilitation treatment

Exclusion criteria

1. Presence of additional severe medical conditions preventing active rehabilitation (eg, cardiac failure, severe chronic lung disease necessitating a constant use of oxygen);
2. Patient with aphasia, agnosia
3. Patient with disturbed conscious level

4. Patients receiving anti psychotic drugs, antiepileptic and anticoagulant drugs
5. Other causes of dementia rather than stroke

II-Study Tools

Content validity of the tool: Tools were reviewed by experts in nursing and medicine sciences at Assiut University.

The researcher after reviewing different related researches and literatures and tools validated and used by neuropsychiatrics department.

Tool A : consisted of two parts

Part (1): An interview questionnaire were used to collect data about:

- I Socio-demographic data: this included question such as name, age, gender, residence, marital status, level of education, occupation before retirement.
- Past history : Full past history were taken from elderly, Medical history such as:- Diabetes mellitus, hypertension, heart disease, anemia, atrial fibrillation, respiratory disorder, rheumatic disorder, dementia, urinary tract infection and kidney disease.

Part (2)

This part included questions related to elderly knowledge about stroke included: past history of stroke, present history of stroke, causes of stroke, signs and symptoms of stroke, risk factors of stroke, possible ways for prevention of recurrent stroke, and complication of stroke.

Tool B

Before admission to the nursing intervention, patients were administered the following neuropsychological tests to characterize various aspects of cognitive function (baseline testing) and provide a screen for cognitive impairment and general psychological status **included:**

1. Mini-Mental State Examination (**Folstein et al., 1975**): a brief assessment of general functioning that screens for dementia. This scale include five items (orientation, registration, Attention & calculation, recall and language , the total score for this scale is 30 degree. A score less than or equal to 23degree was required for inclusion criteria for educated elderly and score greater than or equal to 19degree was required for illiterate elderly. The scoring were considered normal from (23-30 = Normal / 19-23 = Borderline / <19 =Impaired).
2. Digit Span (forward and backward, this scale validated and used by neuropsychiatric department) , forward span measures simple attention, with backward span providing a general index of working memory; In forward span the researcher give the patient numbers from four to eight numbers and ask patient to forward this numbers

in sequence, in backward span the researcher give the patient from four to eight numbers and ask patient to backward this numbers. The patient had impairment in the brain if know one to three numbers, moderate impairment from three to four, mild impairment from four to five and the patient had normal cognitive status if know six numbers and more.

3. Logical Memory (this scale validated and used by neuropsychiatric department), immediate recall of two short stories; the researcher read for elderly stroke patients two short stories and after that ask him to recall the words of these stories. The researcher give one degree for each word recall and collect degree of these words. A patient recall most words of two stories have a good memory for recall.
4. Geriatric Depression Scale GDS; (Brink, 1982, Yesavage, 1983 - & Sheikh, 1986), a test of depression commonly used in the elderly population. This scale include fifteen items if the patient take (From 0-4 the patient is normal, 5-8 mild depression, 8-11 moderate depression, 12-15 sever depression)
5. The Barthel Index establishes a patient's degree of independence in activities of daily living (ADL). This scale include items related to feeding, bathing, grooming, dressing, bowels, bladder, toilet use, transfers, mobility and stairs. (Barthel scores. **Shah et al., 1989** suggested that scores of 0-20 indicate "total" dependency, 21-60 indicate "severe" dependency, 61-90 indicate "moderate" dependency, and 91-99 indicates "slight" dependency).

Field work

Ethical consideration

- An ethical approval from Assiut university committee was obtained to conduct the study.
- Oral consent of each participant in this study was obtained and informed that the information obtained will be confidential and used only for the purpose of the study

Pilot test

- A pilot study was conducted before starting data collection to evaluate the clarity and applicability of the questionnaire and to do the necessary modification. Also to determine the time needed. It was carried out on 5 elderly persons from the previous settings. Analyses of the pilot study revealed that minimal modifications are required. These modifications were done and the subjects were excluded from the actual study.
- Data collection was during the period from September 2011 to September 2012, three days

weekly, the average number which interviewed was 1-2 elderly per day. The approximate time spent during the filling of sheet was around 30-45 minutes. according to respond of patient. Post test after two weeks and follow up after one months of nursing intervention rehabilitation program.

Program constructure or development

It consisted of 3 phases

1. Phase (I): Preparatory phase and administrative design

An official letter from the dean of the faculty of nursing to the head of neurological department and head of physiotherapy department and oral permission from elderly people to obtain their vital assistance and necessary approval to conduct the study. This letter includes a permission to carryout the study and explain the purpose and nature of the study.

Assessment phase

- At initial interview the researcher introduce her self to elderly to initiate line of communication, explain the nature & purpose of the training program and filled out questionnaire sheet (tool 1) before implementation training program to assess theoretical knowledge needs of elderly.

Phase (II): Designing and implementation phase

- The researcher started a face to face individual interview with elderly, stroke patients, completed the sheet for all persons and wrote exactly the answers that the elderly persons given. After implementing the sheet and choose the study and control groups according to inclusion and exclusion criteria. The researcher begin the program by giving the elderly stroke patients pictures to improve memory, this pictures repeat for two weeks. (three times per week this pictures include: spatial memory, visual memory, visual and spatial abilities, attention and concentration, visual and spatial perception, sustained attention and concentration all this picture work on visual processing to improve working memory and concentrations.

Rehabilitation Program

- **Description of the program:** the program has been developed by the researcher based on review of relevant literature, revision of my supervisors in neurological department and community health nursing department. It were designed for stroke patients based on their functional abilities. The patient was en-courage to participate actively in the treatment program.
- **General objectives of the program:**
 - To improve cognitive function of elderly stroke patients.

Teaching methods:

Group of teaching method and audio-visual aids were used such as lecturing, discussions, brain storm and Computerized training.

Media:--Handout -Pictures

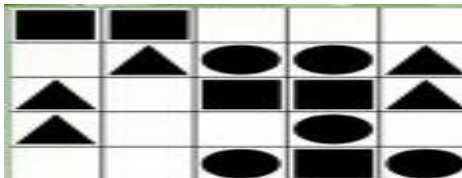
Content of the program

The program consist of Three theoretical session about health education for diabetes mellitus, hypertension and prevention of recurrent stroke and five practical session about spatial memory, attention and concentration, visual attention, fish face task and N400 task.

1- Spatial Memory

The task: The patient has to memorize the number of those elements and recall their number afterwards (Number of square, circle, triangle)

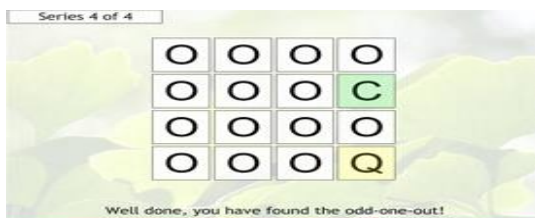
-The patient has to memorize the location of those elements and recall their position afterwards.



<https://www.scientificbraintrainingpro.com/programs/re>

2-Attention and concentration

The task: In this task, the patient needs a discriminating eye to must either locate a symbol in a grid full of intricate symbols and letters (intruder) that differs from other symbols (all of which are identical), and catch the sneaky suspect that was shown before starting the task and that does not belong.



<https://www.scientificbraintrainingpro.com/programs/re>

3-Visual Attention

- **The task:** In this exercise, the patient must pay close attention to two sets of characters. His task is to distinguish on the second set the characters that are different from the first set of characters.



<https://www.scientificbraintrainingpro.com/programs/re>

- Also the researcher training the group 1 (study group) on computerized program fish face task (visual processing) and N400 task (auditory processing) in fish face task the patients see drawing of people who each have some pet fish. Different people have different kinds of fish. Their job are to learn which kinds of fish each person has. At first, the researcher help stroke patients to guess color of fish with person after that begin the training and ask patients what fish does this person have? Click left or right on mouse by help from researcher because some patients had right sided hemiplegia. After that change position of fish and ask patients again until know the correct answer .
- As regard N400 task (auditory processing) this computerized training program to improve working memory, in this task the researcher hear the elderly stroke patients name of two things as sea and fish , boy and dog, book and pencil, hair and comb, pharmacy and drug, girl and cow, boy and cooker, queen and tiger, camel and desert, bed and pillow, cup and coffee, man and tree, lion and seller, hoarse and client and so on, after the patient hear two names from these things ask if two things similar or different. This training repeat three times in the same session for three day.
- After that give patients health education about diabetes mellitus, hypertension and prevention of recurrent stroke and also teach patients exercise to

improve activities of daily living. These health education and exercises were given for both groups (study and control group).

Phase (III): evaluation phase

In which the elderly stroke patients evaluated in pre and after program implementation as well as after one months through filling the tools to evaluate the degree of cognitive impairment of elderly stroke patients.

Statistical analysis:

Data were analysed using SPSS v.16. The following tests for significance were used, frequency, percentage, means and standard deviation, chi square. ANOVA and t-test for comparison of means. A probability level of 0.05 was adopted as a level of significance for testing the research hypothesis.

Results

Table (1): Distribution of socio demographic characteristics for both studied groups at Assiut University Hospital, 2012.

Variables	Study(n=35)		Control (n=35)		X ²	P-value
	N	%	N	%		
Age						
60-	20	57.1	19	54.3	7.99	0.924
65-	8	22.9	9	25.7		
70 >	7	20.0	7	20.0		
Mean ± S.D	64.22. ±5.68		65.14±6.42			
Marital status:						
Single	0	0.0	0	0.0	2.61	0.270
Married	30	85.7	26	74.3		
Widow	0	00.0	2	5.7		
Divorce	5	14.3	7	20.0		
Level of education:						
Read and write primary education	18	51.4	25	71.4	4.69	0.320
prep education	10	28.6	8	22.8		
secondary	2	5.7	0	00.0		
University	3	8.6	1	2.9		
	2	5.7	1	2.9		
Sex						
Male	18	51.4	14	40.0	.921	0.337
Female	17	48.6	21	60.0		
Work before retirement						
House wife	17	48.6	21	60.0	.923	0.630
Employ	5	14.3	4	11.4		
Non employ	13	37.1	10	28.6		
Living status						
Alone	7	20.0	7	20.0	.000	1.000
With other	28	80.0	28	80.0		

N.S. $P > 0.05$

Table (2): Distribution of past history, of stroke for both studied group at Assiut University Hospital, 2012.

Variables	(Study group) (n=35)		(Control group)(n=35)		X ²	P-Value
	N	%	N	%		
Past history of stroke						
Yes (recurrent)	10	28.6	10	28.6	1.02	0.600
NO (single)	25	71.4	25	71.4		
Type of stroke						
Ischemic stroke	26	74.3	23	65.7	.719	0.698
Hemorrhagic stroke	9	25.7	12	34.3		
Side of hemiplegia						
Left side	20	57.1	16	45.7	.915	0.698
Right side	15	42.9	19	54.3		

N.S. $P > 0.05$

Table (3): Distribution of risk factors of stroke among studied group at Assiut University Hospital, 2012.

Risk factors	(Study group) (n=35)		(Control group) (n=35)		X ²	P-Value
	N	%	N	%		
Family history of stroke	6	17.1	4	11.4	.467	0.495
High blood pressure	29	82.9	32	91.4	1.14	0.284
Heart disease	4	11.4	2	5.7	.729	0.393
Smoking	5	14.3	7	20.0	.402	0.526
Diabetes	20	57.1	17	48.6	.516	0.473

N.S. $P > 0.05$

Figure: (1) : Number of risk factors of stroke patients among studied groups.

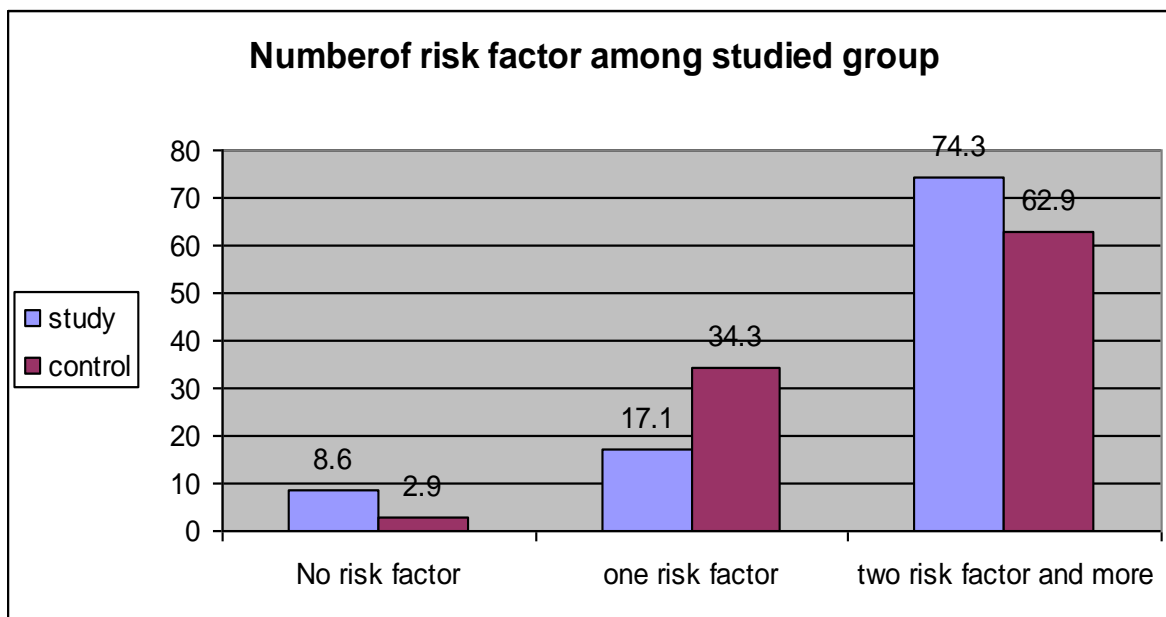


Table (4): Distribution of method for prevention of stroke recurrence for both studied group at Assiut University Hospital, 2012.

Method for Prevention of stroke	(Study group)I(n=35)		(Control group) (n=35)		X ²	P-Value
	No	%	No	%		
Eat healthy diet by reduction of saturated fat and salt. Eat fruits and vegetables	10	28.6	6	17.1	1.29	0.255
Stop smoking .	5	14.3	6	17.1	.108	0.743
Treatment of blood pressure & diabetes mellitus	17	48.6	7	20.0	6.34	0.012*
continue the treatment of stroke as aspirin in case of ischemic stroke.	10	28.6	5	14.3	2.12	0.145
Exercise, walked for 30 minutes three times a week	2	5.7	2	5.7	.000	1.000

*Significant $P < 0.05$

Table (5):Relation between studied group regarding their Mini Mental State Examination, (MMSE) in pre , post and follow up test.

MMSE	Pre test Mean \pm S.D	Post test Mean \pm S.D	1 month follow up Mean \pm S.D	P-value1 One way ANOVA	P-value2 Two way ANOVA
Study group	19.20 \pm 2.22	22.60 \pm 2.84	23.08 \pm 1.85	0.001*	.000*
Control group	18.00 \pm 3.21	18.22 \pm 3.14	18.45 \pm 3.06	0.08	
P-value (T-Test)	.092 0	.000* 0	.000* 0		

*Significant $P < 0.05$

N.S. $P > 0.05$

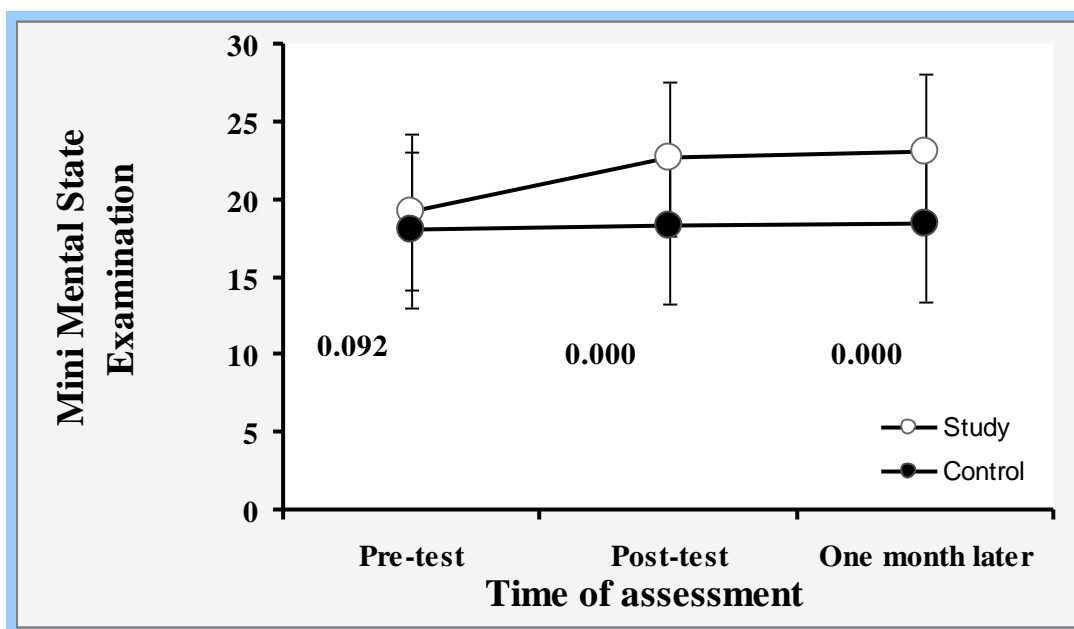
Figure: (2) : Relation between studied group regarding Mini Mental State Examination.

Table (6): Distribution of geriatric depression scale for both studied group.

Geriatric depression scale	Study group(n=35)		Control group(n=35)	
	Pre		Pre	
	No	%	No	%
Normal	1	2.9	2	5.7
Mild depression	17	48.6	17	48.6
Moderate depression	10	37.1	11	31.4
Severe depression	4	11.4	5	17.1
P-value (pre test)	0.128			

* N. S. $P > 0.05$

Table (7):Relation between studied groups regarding Geriatric depression scale, in pre , post and follow up test.

Geriatric depression scale	Pre test	Post test	1 month follow up	P-value1 One way ANOVA	P-value2 Two way ANOVA
Study group	7.82±2.82	6.91±2.46	5.91±2.04	0.001*	.000*
Control group	7.80±2.39	7.34±2.32	7.54±2.47	0.003*	
P-value (T-Test)	0.964	0.457	0.004		

Significant $P = < 0.05$.

Figure: (3) : Relation between studied group regarding Geriatric depression scale

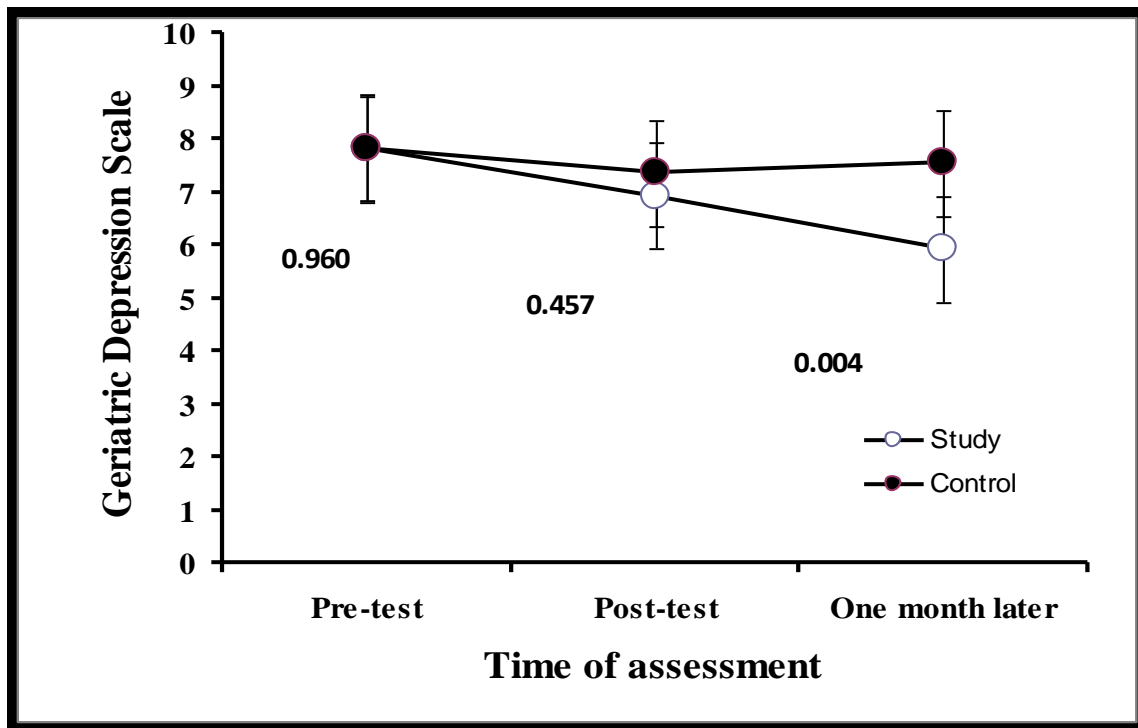


Table (8) : Distribution of Barthel scale for both studied group.

Barthel scale	Study Group I n=35		Control Group II n=35	
	Pre		Pre	
	No	%	No	%
Total dependent(0-20)	12	34.3	8	22.8
Sever dependent(21-60)	18	51.4	24	68.6
Moderate dependent(61-90)	5	14.3	3	8.6
Slight dependent(91-99)	0	0.0	0	0.0
P-value (pre test)	0.119			

*N.S $P>0.05$ **Table (9):Relation between studied groups regarding barthel scale in pre , post and follow up test.**

barthel scale	Pre test	Post test	1 month follow up	P-value1 One way ANOVA	P-value2 Two way ANOVA
Study Group I	39.85±23.15	44.00±22.45	46.14±21.38	0.001*	.000*
Group II Control	37.57±17.42	37.28±17.67	37.85±17.55	0.229	
P-value (T-Test)	.642 0	.1690 0	0.060		

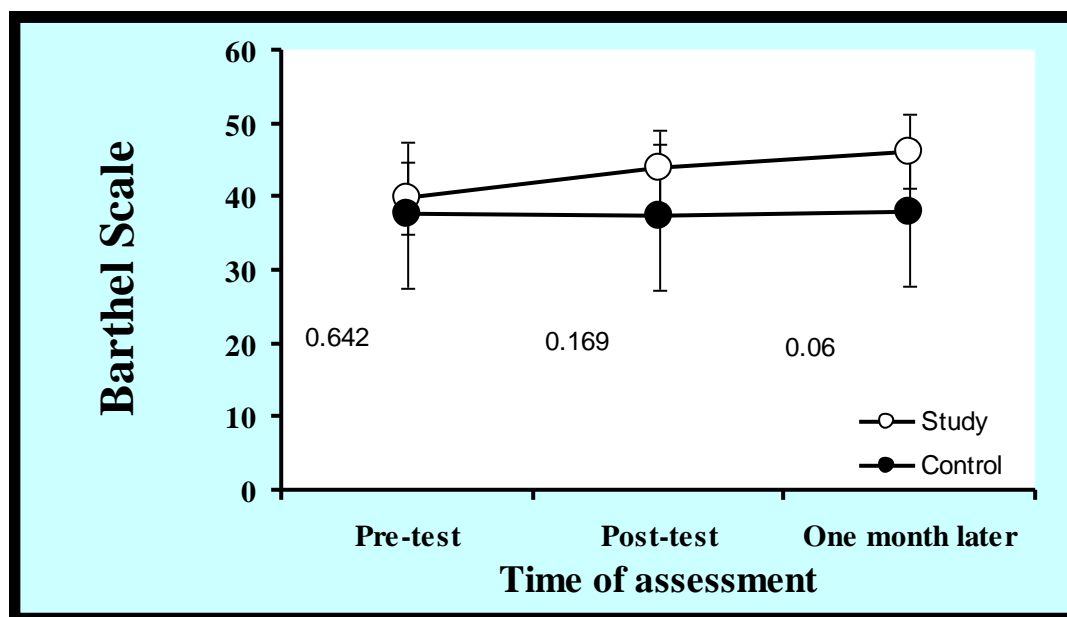
*Significant $P<0.05$ N.S $P>0.05$ **Figure: (4) : Relation between studied group regarding barthel scale.**

Table (1): illustrate that, more than half of the studied sample (Group I & Group II (7.1, 54.3%) their ages ranged from 60 to 64 years with mean of age (64.22. ±5.68) . The majority of them (85.7%) were married.. As regards educational level, it was observed that 34.3 of the studied sample were had education less than 6 years compare to 14.3% of them were had education more than 6 years, also more than half of them (51.4, 71.4%) were illiterate. Concerning work before retirement it was observed that 48.6%

were house wife compare to 60% of Group II Others details were illustrated in the table. No statistical significant difference was found between group I and group II as regarding sociodemographic characteristics.

Table (2): show that 28.6% of the studied sample had recurrent attacks of stroke and about three quarters of group I (74.3%) had ischemic stroke compare to 65.7% of group II. As regards to the affected side, more than half of group I (57.1%) their affected side

were the left side compare to 45.7% of group II. No statistical significant difference was found between group I and group II as regarding past history, type of stroke and affected side.

Table (3): revealed that the majority of both group I & group II (82.9%, 88.6% respectively) don't have family history of stroke. As regard hypertension , it detected in the majority of the studied sample (82.9, 91.4% respectively) . More than half of group I (57.1%) and about 48.6% of group II had diabetes mellitus as risk factor of stroke. Among the group I; smoking was present at 14.3% compare to one fifth (20.0%) of group II. No statistical significant difference was found between group I group II as regarding risk factors of stroke among studied group

Figure (1): show that the majority of both group I and group II (74.3%, 62,9% respectively) had two risk factor of stroke and only (8.6%, 2.9% respectively) of group I and group II don't have risk factor for stroke. No statistical significant difference was found between group I & group II as regarding number of risk factors among studied group P-value=(0. 189).

Table (4): illustrates possible ways for prevention of recurrent stroke, it was observed that about half (48.6%) of group I said treatment of blood pressure& diabetes mellitus compare to exactly one fifth (20.0%) of group II . As regard exercise only 5.7% of both group I and group II stated that walking exercise prevent recurrent stroke.

Also this table show that, the majority of studied sample (71.4% , 85.7%) respectively don't know continue taking of aspirin in case of ischemic stroke to prevent recurrent stroke. Statistical significant difference was found between group I & group II as regarding treatment of blood pressure& diabetes mellitus (**P= 0.012**)

Table (5) and figure (2) :shows that there was statistical significant difference in pre, post test and follow up (P-value = 0.000*) between studied group regarding Mini Mental State Examination.

Table (6): shows that nearly half of both studied groups (48.6%) had mild depression before starting the program, and only 2.9%, 5.7% for both studied group were normal. No statistical significant difference was found between group I & group II as regarding geriatric depression scale for both studied group **P-value = 0.128**

Table (7)figure (3):revealed that there was statistical significant difference between two group in pre, post and follow up test regarding geriatric depression scale (**P-value = 0.000***).

Table (8): shows that (34.3%) of study group before starting the program was totally dependent in barthel scale item and more than half of both study and control group (51.4%, 68.6% respectively) were

severe dependent before starting the program. No statistical significant difference was found between group I & group II as regarding barthel scale items in pre test (**P value=0.119**).

Figure: (4) showed that there was statistical significant difference in pre, post, and follow up test (**P-value = 0.000***) between group I & group II regarding barthel scale . Also show that no statistical significant difference between pre , post and follow up for group II (**P-value = 0.229**).

Discussion

The findings of present study showed that, the mean age group of the studied sample were 64.22. ± 5.68 for group I and 65.14 ± 6.42 for group II. More than two fifth of studied samples were males and more than half of them were females. Also the majority of studied sample (85.7%, 74.3% respectively) were married.

This result was agree with **Pakaratee, & Kongkiat, (2012)** they studied the effectiveness of home rehabilitation program for ischemic stroke upon disability and quality of life and found that the mean age group of the studied group was 67 years and 66 years for control group, more than two fifth of them were males.

Also agree with **Bernard, et al, (2007)** they studied online cognitive training improves cognitive performance and reported that the sample was nearly evenly divided between women (58%) and men (42%).

Regarding living status the majority of the studied sample were living with other and only one fifth living alone. This result agree with **El-Shater, (2008)** who studied prevalence and risk factors of vascular cognitive impairment without dementia in patients with first-ever stroke and reported that among the studied sample 12.1% were living alone. This present because the majority of the studied samples were dependent on others and most of them can't live alone because their disability.

As regarding educational level, it was observed that 34.3% of the studied sample were had education less than 6 years compare to 14.3% of them were had education more than 6 years. Also more than half of studied sample (51.4, 71.4% respectively) were illiterate. This may because more than half of studied sample were females and in the past the culture of educated female was absent.

Regarding past history of stroke, the finding of present study revealed that more than one quarter of the studied sample (study and control) had recurrent attacks of stroke. This result was consistent with **Lasse, et al, (2010)** they studied the depressive symptoms in stroke patients and reported that

previous stroke was found in more than one quarter of the studied sample. This present because most elderly patients non compliance with medication regiment, and this exposure them to second attack of the disease.

As regard affected side, more than half of study group (57%) their affected side were the left side compare to 43% of control group. This result in line with **Devora, & David, (2005)** , and **Khedr, et al., (2013)**. Also this result agree with **Griffin, (2008)** who study influence of post stroke cognitive status and social support availability on rate of functional recovery during acute rehabilitation and found that more than half of studied group their affected side were the left side compare to more than two fifth their affected side was the right side .

Concerning type of stroke about three quarters of study group had ischemic stroke compare to two thirds of control group , also more than one quarter for study group compare to more than one third of control group had hemorrhagic stroke.

This result similar with **Fawi, et al (2009)** who studied the characteristics of hospitalized stroke patients and case fatality in Upper Egypt Governorates Areas (Sohag, Qena, Aswan). Hemorrhagic strokes reported in more than one third of cases. Also this result was agree with **Griffin, (2008)**

Khedr, et al., (2013) Reported that there was a significantly higher prevalence of ischemic than hemorrhagic stroke and hypertension being the commonest risk factor then diabetes mellitus second in epidemiological study and risk factors of stroke in Assiut Governorate, Egypt: Community-Based Study , this agree with result of the present study.

Concerning risk factors the result of the present study revealed that the majority of both studied groups don't have family history of stroke . This result was in line with **Tamer, (2009)** who study the acute cerebrovascular stroke cases admitted to Alexandria main university hospital and found that the majority of studied sample don't have family history of stroke.

As regard hypertension , it was detected in the majority of the studied sample . This result was agree with **Suchat, et al., (2011)** who study prevalence of stroke and stroke risk factors in Thailand and found that hypertension was recorded in the majority of the studied sample.

In the present study diabetes mellitus was reported in more than half of study group and about half of control group. Also smoking was present at less than one fifth of study group compare to one fifth of control group. This result was disagree with **Fawi, et al (2009)** who study case fatality in Upper Egypt governorates areas (Sohag, Qena, Aswan) found hypertension in less than half of studied sample and

diabetes mellitus in less than one quarter this may because small sample of the current study also smoking was found in more than one third of studied sample this contrast with the result of current study this may because half of studied sample were females. This present because age related changes in elderly people (taste sensation decrease especially in salt and sweet food and also bad habits in diet, may exposure them to hypertension and diabetes)

Regarding number of risk factors of stroke among studied groups less than three quarter of both studied groups had two risk factor of stroke this result was in line with **Khedr, et al., (2013)** who reported that less than three quarter of studied sample had one or more risk factors for stroke.

The result of the present study revealed that, about half of study group said treatment of blood pressure& diabetes mellitus possible ways for prevention of recurrent stroke compare to exactly one fifth of control group . This result was consistent with **Rashid, et al., (2003)** they studied blood pressure reduction and secondary prevention of stroke and other vascular events and states that antihypertensive medications reduced the risk of recurrent stroke after stroke or TIA.

Regarding stop smoking only less than one fifth of studied groups stated that stop smoking away for prevention of recurrent stroke. This result was in line with **Goldstein, et al., (2006)** who study guideline statement on primary prevention of ischemic stroke. Also regarding physical activity as walking only 5.7% of both studied group stated that walking exercise prevent recurrent stroke this percent may be elderly people don't found people encourage them for walking or because disability from stroke.

Bernard, et al., (2007) they studied online cognitive training improves cognitive performance and reported that significant improvement in all cognitive domains(P-value = 0.000*). **Cha& Kim, (2013)**. They studied effect of computer-based cognitive rehabilitation (CBCR) for people with stroke and found that (CBCR) is effective on improving cognitive function after stroke. This result was agree with result of present study.

This study found that nearly half of both (study and control group) had mild depression before starting the program, this percent improved after application of the program and there was a statistical significant difference between two group in pre, post and follow up test (P-value = 0.000). This because the effectiveness of the rehabilitation program and elderly patient need just talking with them for improving their psychological status.

This result was agree with **Lasse, et al., (2010)** they studied depressive symptoms in stroke patients and

found The prevalence of depression was relatively unchanged from baseline (56%) to 13 month. Concerning barthel scale this result shows that more than half of both studied groups were severe dependent before starting the program in barthel scale items. This result was agree with **El-Shater, (2008)**. Who reported that more than half of study group were had severe functional impairment. This because cognitive impairment following stroke can reduce a person's independence in performing basic activities of daily living (ADL) such as eating, dressing, and toileting as well as instrumental ADL such as housework and social interactions also this agree with **Zinn, et al., (2004) and Burton et al,(2009)**. After application of the program this percent improved in study group only this because the effectiveness of the rehabilitation program. P-Value 0.000*

Conclusion

Based on the results and research hypothesis of the present study, it can be concluded that:

- Elderly Patients with post stroke dementia have a significant impact on physical and psychological status of stroke patient. Hypertension and diabetes mellitus were a major risk factor for stroke. Most stroke patients had moderate depression and were dependent in activities of daily living. Application of nursing intervention program about cognitive impairment of stroke patients have significant therapeutic effect on cognitive function, and on activities of daily living.

Recommendation

Based on the results of the present study, the following recommendations are suggested:

1. Routine use of screening assessment of cognitive impairment in every stroke patient for early detection.
2. The nature of the impairment should be determined, and its impact on activity and participation should be explained to patients.
3. Proper and update neurorehabilitation of early cognitive compromization, and all cognitive rehabilitation tasks should focus on improving real life functioning.
4. Health education to the elderly patients about the possible ways of prevention of recurrent stroke and ways for controlling of diabetes and hypertension.
5. Replication of the study on a larger probability sample acquired from different geographical areas in Egypt to figure out the main aspects of this problems. And generalize the result.

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