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The Effect of Health Education Intervention for Informal Caregivers of Elderly Persons Post Stroke

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Abstract: A stroke is a serious, life-threatening medical condition that occurs when the blood supply to part of the brain is obstructed. It is the most common cause of death worldwide. Stroke leads to loss of independence, and decreased quality of life. **Aim:** Evaluate the effect of health promotion intervention for elderly persons post stroke and their informal caregivers. **Design:** A quasi-experimental design was applied. Setting: This study was carried out in two neurology out-patient clinics, El Nasr insurance hospital at Helwan city and Aswan University hospital, Egypt and followed by home visit to elderly. **Sample:** A purposive sample was applied. **Sample Size:** 70 elderly persons and their informal caregivers. **Tools:** three tools were used: (1) An interview questionnaire sheet included elderly persons and informal caregivers intervention. **Recommendations:** A similar study can be applied by a nurse researcher of the neurological out-patient's clinics in other settings to evaluate caregivers' knowledge and practices about stroke and its management, demographic characteristics, and their knowledge about stroke. (2) Barthel Index of activity of daily living for elderly. (3) An observational checklist for assessing the informal caregivers' practices. Results: The study revealed that there was a statistically significant improvement in elderly persons' activities of daily living and informal caregivers' knowledge and practices after applying intervention. **Conclusions:** Elderly persons post stroke activity of daily living and informal caregivers' knowledge & practices about needs and care to elderly person post stroke improved after applying health promotion.

Keywords: Elderly Persons, Informal Caregiver, Post Stroke.

INTRODUCTION

Stroke means 'a neurological inability attributed to an acute focal damage of the central nervous system (CNS) by a vascular cause'.^[1] Stroke is one of the major causes of loss of independence, decreased quality of life and increased mortality among elderly persons^[2]. The incidence of stroke disease increases with age, in both men and women with nearly 50% of all strokes occurring in people over age 75 and 30% over age 85^[3]. Stroke is the second cause leading to death worldwide^[4]. Worldwide stroke-related illness, disability and early death is set to double in the next 15 years (by 2035)^[5]. The number of stroke events in Europe is expected to rise from 1.1 million in 2000 to 1.5 million per year by 2025, largely due to the ageing population^[6]. The elderly persons have increased stroke prevalence, greater stroke-related mortality and disability, and are at higher risk of complications related to thrombolytic treatment compared to younger patients^[9]. Disability from stroke is now emerging as a major public health problem, particularly in the elderly, as observed an increase in aging of the population^[10].

Elderly persons with stroke are often confronted with disabilities in physical, psychological and social functioning which have a serious impact on the patient's activities of daily living (ADL), and cause a greater range of disabilities than any other condition^[11]. Also, stroke may affect walking, talking, speech, balance, co-ordination, vision, spatial awareness, swallowing, bladder control and bowel control^[12]. These changes in function following stroke require rehabilitation, and/or continued care^[13]. The results

of stroke vary widely depending on size and location of the lesion^[14]. The most common health problems of elderly with stroke are emotional and psychological problems such as depression or cognitive deficits, social problems and health-related problems including rest paralysis and fatigue^[15].

Elderly persons who have a stroke may have problems with many activities that were easy before, such as walking, talking, and taking care of "activities of daily living (ADLs)". These include basic tasks such as bathing, dressing, eating, and using the toilet, add to more complex tasks called "instrumental activities of daily living (IADLs)", such as housekeeping, using the telephone, driving, and writing checks^[16]. Stroke is a family disease and has the ability to influence the health and quality of life not only of the individuals but their family caregiver as well^[17]. Caregivers play a major role in long term well-being of elderly persons post stroke and their rehabilitation^[18].

Many caregivers have shortage background information about stroke, caring for elderly persons with stroke survivors, and the ways to prevent complication and future attacks of stroke^[18]. Many caregivers have low basic information about stroke management, strategies for caring for elderly person with stroke survivors, and the ways to prevent complication and future attacks of stroke^[19]. Moreover, informal caregivers face the dual challenge of coming to terms with the sudden onset and subsequent disabling impact of stroke and the realization that the elderly person may require long-term support^[20]. Support for the informal caregivers by knowledge and practices about management elderly person with stroke is important to

decrease the burden of care and improve quality of life of elderly person^[21].

Caregivers need to be educated and trained under professional supervision from nurses to provide elderly stroke patients suitable intervention and rehabilitation^[22]. Providing appropriate and sufficient knowledge is a key support to prepare caregiver for their new role and this can be achieved by a specific teaching program prepared by qualified nurses^[23]. So a program could benefit both survivors and family caregivers by helping them feel more confident in their caring role and helping to reduce their strain. It is also an effective way to ensure that stroke survivors receive the rehabilitation required to promote quality of life and restore maximum function^[24].

Significance of study:

According to few epidemiological studies, incidence of stroke in Egypt was 1.8/1000 between elderly persons annually. Also, male elderly persons are more risky for stroke in Egypt than female, they constituted 58.2% of elderly persons with stroke versus female^[7]. Review of Aswan University Hospital; statistical records revealed that about 520 elderly patients with stroke were admitted to the neurology departments annually. Also, in El Nasr insurance hospital at Helwan city statistical records showed that about 640 elderly patients with stroke were attended to the medical neurology out patient clinic annually.

The hospital nurses must educate care giver about discharge plan. Nurses could anticipate the care problems encountered by informal caregivers after discharge, those needs could be addressed during hospitalization, leading to an improved quality of care at home. Therefore, nurses must determine all health needs of elderly with stroke and prepare health education intervention to learn informal caregiver and elderly stroke persons^[25].

Aim of study:

The study aimed to evaluate the effect of health education intervention for elderly persons post stroke and their informal caregivers through the following objective:

- 1- Determining the elderly person post stroke activity of daily living
- 2- Assessing the informal caregivers' knowledge & practice about needs and care to elderly person post stroke.
- 3- Designing health education intervention about needs and care to elderly persons post stroke.
- 4- Implementing of health education intervention for informal caregivers to elderly person post stroke.
- 5- Evaluating activity of daily living for elderly persons post stroke
- 6- Appraising informal caregivers' knowledge & practices about needs and care to elderly person post stroke.

Hypothesis:

H1- Elderly persons' activity of daily living post stroke will be improved after implement the health education intervention.

H2- Informal caregivers' knowledge & practices about needs and care to elderly person post stroke will be improved after health education intervention.

SUBJECTS AND METHODS

Research Design: A Quasi-experimental design was used in the study.

Setting:

The study was carried out in two governmental out-patient clinic namely neurology out-patient clinic, El Nasr insurance hospital at Helwan city; it works three days per week and neurology out-patient clinic, Aswan University hospital; it works two days per week, and followed by home visit to elderly.

Sample: A purposive sample. Included both elderly persons and their informal caregivers selected from the above used setting, according following criteria: aged 60 years and above, diagnosed with stroke, able to communicate and accept to participate in the study. Their number 70 elderly persons post stroke (40 from Aswan University hospital and 30 from El Nasr insurance hospital in Helwan city). Caregivers: The number of informal caregivers included in the study was 70 persons and fulfilled the following criteria: responsible for providing care to the elderly persons post stroke, and accept to participate in the study.

Tools: Three tools were used to collect the data of this study.

Tool I: An interview questionnaire:

This it developed by the researcher. It consisted of four parts:

Part 1: Concerned with demographic characteristics of elderly persons post stroke such as age, sex, marital status, income, level of education etc. And demographic characteristics data of the Informal care giver as age, residency, and level of education, source of income, and marital status.

Part 2: This part deal with elderly post and present medical history. It included 7 items as previous hospitalization, time of stroke, associated disease, current medications, duration of disease, etc.

Part 3: Informal Caregivers' Psychological Status consisted of ten items as feel responsibility to provide care for elderly, feel satisfaction about care provided to elderly, need assistant during provide elderly care Taking enough time for sleep, suffering from stress or effort during provide care to elderly person, etc.

Part 4: Informal Caregivers' knowledge about stroke

It include 15 questions on Arabic language as meaning, causes of stroke, risk factors, signs and symptoms, complications, preventions, treatment, available community health services for stroke elderly person and importance of follow-up. The answers were scored based on the level of knowledge of the studied subjects. Each question had 3 possible responses: complete correct answers (2), incomplete answers (1), and incorrect answer (0). The total score is 30. The higher score indicates a greater level of knowledge. Informal caregivers' answers were compared with a model key answer and accordingly their knowledge were categorized into either:

- Poor knowledge: Less than 50%.

- Fair knowledge: From 50- 75 %.
- Good knowledge: More 75%.

Tool II: Barthel Index of activity of daily living composed of ten items such as bowels, bladder, and grooming ...etc.Total possible scores range from 0 – 20, with lower scores indicating increased dependency.

Tool III:An observational checklist of informal caregivers' practices for assessing the informal caregivers' practices toward elderly person with stroke. It include 10 items related to range of motion, change position, measure vital signs, observe of dangerous signs of stroke, give elderly medication on time, communication skills etc. Scoring system of the practices on the checklist was made using a 3-point liker scale, a zero (0) scored for the items which not done, one (1) means done incorrectly, while two (2) means done correctly. The total score is computed out of 20. The higher score indicates a greater level of elderly person caregiver's practices were categorized into either:

- Inadequate practices: <60%.
- Adequate practices: ≥ 60%.

Preparatory phase:

Construction of the health educational intervention: The first step in contracting this program was to determine the objectives. A review of the past, current related literature, covering various aspects of elderly post stroke. In addition to the use of available books, articles, periodicals, magazines, and internet search, to get aware with the research problem and improve the study tools and the intervention content.

Validity:

The tool was distributed among group of experts (three in the field of community health nursing, and two of geriatric health nursing). According to experts' views, the researchers made all modification suggested.

Reliability:

The reliability of the modified scale was done using the internal consistency method. The reliability proved to be high with Cronbach alpha coefficient = 0.873 for knowledge and 0.925 for practices.

Pilot study:

A pilot study was performed on 10 % of studied sample, males and females, to evaluate the content of the tools. A pilot study was used to assure clarity of questions, to remove any ambiguity, also helped to estimate the time required for application of the tools and to build up the program. Those who shared in the pilot study were included from the main study sample because no changes done on the tools.

Field work:

Data were collected from beginning of Mars 2017 up to the end of August 2017. It was fulfilled by the investigators for informal caregivers to elderly person post stroke in neurology out-patient clinic carried at El Nasr insurance hospital and Aswan University hospital. An official approval was obtained from the study settings to carry out the study. A clear explanation was provided about the nature, and the expected outcomes of the study. The investigators began to collect data and explain objectives of

the study during the interview. The researchers started each phase with a summary for a previous one. The investigators used different teaching methods to appraise elderly persons post stroke health status and their informal caregivers' knowledge and practices pre – post implementation of the intervention program.

Assessment phase:

The investigators first introduced themselves and explained the purpose of the study briefly to the informal caregivers to elderly person post stroke. Every informal caregiver of elderly person post stroke was met individually and an oral consent for participation was obtained. The informal caregivers of elderly person post stroke were assured that the obtained information treated confidentially, and used only for the purpose of the study. The investigators read and explained each item of the study scales in front of the informal caregivers of elderly person post stroke separately and recorded his/her response to each item. The time consumed for answering the study questionnaire ranged from 30-40 minutes. The time in which the data were collected was at the beginning of Mars 2017 to end August 2017.

Planning phase:

Based on the results obtained from the assessment phase, the investigators designed the health educational intervention sessions' contents according to the elderly post stroke needs. The health educational intervention sessions were developed after reviewing of related literature, and needs, requirements detected were clarified and discussed in the form of a booklet. Contents of the booklet were selected on the base of identified needs. The booklet consisted of two main parts: The first is a theoretical part which included knowledge about stroke such as definition, types, signs and symptoms, causes, risk factors, classification, diagnostic tests, complications, treatment, prevention and discussing the management of stroke. The second part is a practical, which included applying range of motion, how to change position, how to measure vital signs, analysis of blood sugar, storage of insulin & areas of inject insulin, how to give medication on time, observe of danger signs stroke, create method of communication if elderly aphasia, learn elderly persons and their caregivers stress management techniques, and how to caregivers assist elderly persons to apply ALDs.

Methods of teaching used in the training sessions included lectures, discussions, booklet, give life situation examples, brain storming, role-play and demonstration. Media used were pictures, assistive devices, videos, and illustrated colored booklet prepared by researchers.

Program implementation phase:

An interviewing questioner sheet was applied pre- and post-tests with each informal caregiver of elderly person post stroke, which takes 30-45 minutes. Educational program with target group was started, and the study group was divided into four groups (8-10) informal caregivers of elderly person post stroke. The educational program was divided into 6 sessions; each session lasts 30-45 minutes and was applied three times/week over a period of 6 months.

To ensure that the informal caregiver and elderly person post stroke understands the booklet contents, each session started by a summary about what was given through the previous one and objectives of the new one were explained, taking into consideration the use of simple language to suite the educational level of informal caregivers and elderly person post stroke. Motivation and reinforcement techniques as praise, and recognition during the session were used to enhance motivation and learning.

To ensure exposure of all subjects to the same learning experience, all members received the same contents using same teaching methods, discussion and same booklet. The session was aided by using pictures, posters and the booklet.

The sessions were offered according to the following schedule:

1st session: (Time: 25-45 min)

During the initial session, the investigators explained the aim of the study, and determined the meeting time that was one time/week and gave pre-assessment test. The main objective was to identify definition of stroke, type, cause and sign & symptom

2nd session: (Time: 25-45 min)

This session focused on provide knowledge about high risk groups as elderly person high blood pressures, obesity, smokers, and diabetic person.

3rd session: (Time: 25-45 min)

The focus of this session was to explain diagnostic tests of stroke, and complications of stroke.

4th session: (Time: 25-45 min)

The focused on knowledge concerning the treatment of strokes and prevention in elderly.

5th session: (Time: 25-45 min)

This session focused on importance and how to apply range of motion, and change position /2 hours for elderly persons post stroke, how to observe fingers signs of stroke, and how to create new methods of communication if elderly person have aphasia. How caregivers assist or proved elderly persons to apply ALDs.

6th session: (Time: 25-45 min)

This session focused on practice about how to give elderly persons medication on time, measures vital signs and blood sugars, and give insulin injection if elderly person need it, how to apply stress management techniques for elderly persons and their caregivers and were give a post test.

4) Evaluation of the training program:-

Immediately after the implementation of the health education intervention each elderly person and informal caregiver was assessed using the same study tool.

Statistical analysis: Data were analyzed using the Statistical Package of Social Science (SPSS) software version 20.0. The 0.05 level was used as the cut off value for statistical significance and the following statistical measures were

used: descriptive statistics (count & percentage, arithmetic mean & standard deviation) and analytical statistics (t-test & spearman's correlation coefficient).

RESULTS

Table (1A): shows that the mean age of them was 66 ± 8.5 years. Males were 60% of the studied sample, 50% of the studied elderly were widowed. Also, it was observed that 51.4% of the studied elders were life in rural area and 68.6% of them the monthly income was insufficient.

Figure 1: Shows source of income 37% of elderly persons were family assistant.

Table (1B): Shows that 57.1% of caregivers were at more than age of 40 years old. Concerning marital status 74.4% of caregivers were married and 42.9% of them had secondary education. Also, 64.3 % of informal caregivers living with elderly, 56.8% of them had insufficient income.

Table (2): Clears that, 78.6% of elderly persons reported they admitted once to hospital. Hypertension was the most common disease among the elderly (75.7%). In relation to the current medications used, it was observed that 85.7% of them used anti-coagulants drugs, 78.6 used anti-thrombotic, and 75.7 used anti-hypertensive drugs. Also, 57.1 of the elderly person follow up every two weeks.

Table (3): Shows the distribution of the elderly persons post stroke daily activities. It was observed that statistically significant difference in elderly daily activities pre – post health education intervention in all items of daily activities except feeding, transfer and stairs $P < 0.05$.

Table (4): Explores that, there were statistically significant difference in informal caregivers' psychological status, in post health education intervention than pre ($P < 0.05$).

Table (5): Indicates that, there were statistically significant difference of informal caregivers' knowledge about stroke in post health education intervention than pre ($P < 0.001$) in all items.

Table (6): Shows that, there was statistically significant improvements of informal caregivers' total level of knowledge score regarding stroke in the post intervention than pre where ($P = 0.001$).

Table (7): Displays that, there were statistically significant improvements in the informal caregivers' practice regarding stroke in the post– intervention than pre, ($P = 0.001$).

Figure (2): Shows that, there was statistically significant difference in informal caregivers' total practices regarding stroke in the post intervention than pre, ($P = 0.0001$).

Table (8): Clears that, there was highly statistically significant differences between total level knowledge score and total practices' score of informal caregivers regarding stroke post intervention where ($P = 0.001$).

Table (1A): Distribution of Elderly Persons' Socio-Demographic Characteristics Data(n = 70)

Items	No.	%
Age (years)		
• Young- old (60-)	40	57.1
• Middle-old (75-)	20	28.6
• Old-old (85+)	10	14.3
Mean ± SD =	64 ± 7.9	
Sex		
• Female	28	40
• Male	42	60
Marital status		
• Widow	35	50
• Married	25	35.7
• Divorced	10	14.3
Level of education		
• Illiterate	14	20
• Read & write	22	31.4
• Primary school	22	31.4
• Secondary education	8	11.4
• University education	4	5.8
Residence		
• Rural	36	51.4
• Urban	34	48.6
Occupational		
• Farmer	22	31.4
• House wife	28	40
• Pension (not work)	20	28.6
Income		
• Insufficient	48	68.6
• Sufficient	17	24.3
• Sufficient and save	5	7.1

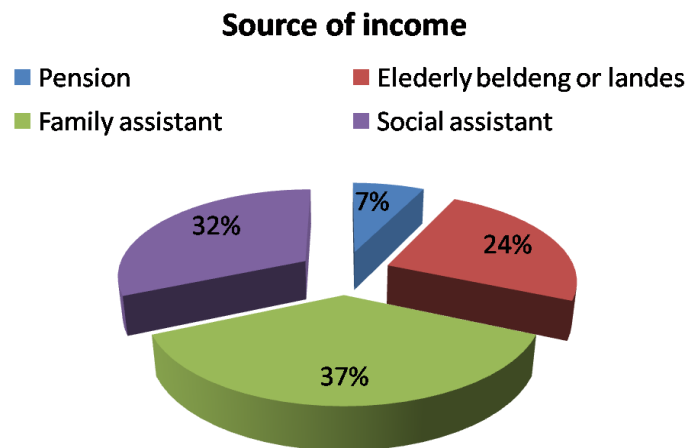


Figure (1): Distribution of Elderly Persons' Source of Income (n=70).

Table (1B): Distribution of Informal Caregivers' Socio-demographic Characteristics (n = 70).

Items	No.	%
Age (years)		
• <30	10	14.3
• >30	20	28.6
• >40	40	57.1
X ±SD	38.41± 9.345	
Sex		
• Female	61	87.2
• Males	9	12.8
Marital status		
• Single	9	12.8
• Married	52	74.4
• Divorced	9	12.8
Level of education		
• Read & write	13	18.6
• Primary school	18	25.7
• Secondary education	30	42.9
	9	12.8

• University education		
Occupational		
• Employee	14	20
• house wife	38	54.3
• Skilled	18	25.7
Time of work for employee (No.=14)		
• Partial time	6	42.8
• Full time	8	57.2
Caregiver's relation		
• Sons	9	12.8
• Daughters	18	25.7
• Sons' wife	22	31.5
• Spouse	21	30
Living situation with the elderly		
• With the elderly	45	64.3
• Not with the elderly	25	35.7
Income		
• Insufficient	46	56.8
• Sufficient	24	29.6

Table (2): Distribution of the Elderly Persons Post Stroke Medical History (present & past) (n=70).

Medical History	Frequency (n=70)	Percent (%)
Previous hospitalization:		
• No	6	8.6
• Once	55	78.6
• Twice	9	12.8
Time of stroke		
• Since one month	30	42.9
• Two month or more	40	57.1
Associated disease :		
• Hypertension	53	75.7
• Diabetes mellitus	15	21.4
• Osteoarthritis	4	5.7
• Coronary artery disease	7	10
• Liver diseases	1	1.5
Current medications used		
• Anti-thrombolytic drugs	55	78.6
• Anti-coagulants	60	85.7
• Anti-hypertensive drugs	53	75.7
• Antacids	20	28.6
• Hypoglycemic drugs	15	21.4
Follow up post stroke		
• Yes	70	100
• No	0	0
Place of follow up		
• In hospital	70	100
• Private clinic	0	0
Periodical time for follow up		
• Every week	10	14.3
• Two weeks	40	57.1
• Every month	20	28.6

Table (3): Distribution of the Elderly Person Post Stroke According to their Daily living Activities pre/ post Intervention (n=70).

Items	Pre		Post		X ²	P
	No.	%	No.	%		
Bowels						
• Incontinent	15	21.4	0	0	54.87	0.001*
• Occasional accident	25	35.7	10	14.3		
• Continent	30	42.9	60	85.7		
Bladder						
• Incontinent, or catheterized	30	42.9	10	14.3	39.65	0.001*
• Occasional	25	35.7	15	21.4		
• Continent	15	21.4	45	64.3		
Grooming						
Needs help with personal care	65	92.9	12	17.1	51.34	0.002*
Independent face/hair/teeth	5	7.1	58	82.9		
Toilet use						
• Dependent	60	85.7	20	28.6	49.56	0.001*
• Needs some help, but can do something alone	7	10	25	35.7		
• Independent	3	4.3	25	35.7		

Feeding						
• Unable	25	35.7	10	14.3	29.76	0.143
Needs help cutting, spreading butter, etc.	12	17.1	25	35.7		
• Independent	33	47.2	35	50		
Transfer						
• Unable – no sitting balance	67	95.7	37	52.8	23.69	0.131
• Major help	2	2.9	20	28.6		
• Minor help (verbal or physical)	1	1.4	10	14.3		
• Independent	0	0	3	4.3		
Mobility						
• Immobile	40	57.1	10	14.3	51.98	0.001*
• Wheelchair independent	20	28.6	35	50		
• Walks with help of one person	10	14.3	10	14.3		
• Independent	0	0	15	21.4		
Dressing						
• Dependent	60	85.7	25	35.7	63.87	0.003*
• Needs help, but can do about half Unaided	10	14.3	29	41.4		
• Independent	0	0	16	22.9		
Stairs						
• Unable	65	92.9	36	51.5	19.79	0.054
• Needs help (verbal, physical, carrying aid)	5	7.1	29	41.4		
• Independent up and down	0	0	5	7.1		
Bathing						
• Dependent	66	94.3	25	35.7	55.64	0.002*
• Independent	4	5.7	45	64.3		

* P< .05

Table (4): Distribution of Informal Caregivers' Psychological Status per / post Intervention (n = 70).

Items	Pre		Post		X ²	P
	No.	%	No.	%		
Feel responsibility to provide care for elderly					53.76	0.004
• Yes	15	21.5	40	57.1		
• Sometimes	27	38.5	20	28.6		
• No	28	40	10	14.3		
Feel satisfaction about care provided to elderly					58.12	0.005
• Yes	16	22.9	45	64.3		
• Sometimes	25	35.7	18	25.7		
• No	29	41.4	7	10		
Having ability to provide elderly more care					48.67	0.013
• Yes	10	14.3	18	25.7		
• Sometimes	20	28.6	29	41.4		
• No	40	57.1	23	32.9		
Need assistant during provide elderly care					54.36	0.005
• Yes	30	42.9	10	14.3		
• Sometimes	25	35.7	15	21.4		
• No	15	21.4	45	64.3		
Feeling frustration if elderly case not progress					39.89	0.041
• Yes	33	47.1	44	62.8		
• Sometimes	27	38.5	20	28.6		
• No	10	14.3	6	8.6		
Taking enough time for sleep					56.21	0.005
• Yes	25	35.7	42	60		
• Sometimes	25	35.7	23	32.9		
• No	20	28.6	5	7.1		
Suffering from stress or effort during provide care to elderly person					57.92	0.004
• Yes	36	51.4	9	12.8		
• Sometimes	26	37.2	19	27.2		
• No	8	11.4	42	60		
Applying stress management techniques					64.83	0.001
• Yes	10	14.3	50	71.3		
• Sometimes	15	21.6	15	21.6		
• No	45	64.1	5	7.1		
Do you have recreational methods?					65.37	0.001
• Yes	9	12.8	47	67.2		
• Sometimes	14	20	13	18.5		
• No	47	67.2	10	14.3		
Need to express negative feeling to others					51.47	0.003
• Yes	32	45.6	15	21.6		
• Sometimes	28	40	22	31.4		
• No	10	14.3	33	47		

Table (5): Distribution of Informal Caregivers' Knowledge about Stroke pre/post Intervention (n = 70).

Items	Pre		Post		χ^2	P
	No	%	No	%		
Meaning of stroke						
• Complete correct answers	0	0.0	55	78.6	52.76	.0001
• Incomplete answers	20	28.7	12	17.1		
• Incorrect or don't know	50	71.3	3	4.3		
Types of stroke						
• Complete correct answers	0	0.0	54	77.1	62.28	.0001
• Incomplete answers	17	24.3	14	20		
• Incorrect or don't know	53	75.7	2	2.9		
Causes of stroke						
• Complete correct answers	2	2.9	61	87.2	56.96	.0001
• Incomplete answers	13	18.5	9	12.8		
• Incorrect or don't know	55	78.6	0	0.0		
Symptoms & sign of stroke						
• Complete correct answers	4	5.7	63	90	55.72	.0001
• Incomplete answers	22	31.4	7	10		
• Incorrect or don't know	44	62.9	0	0.0		
High risk group of stroke						
• Complete correct answers	0	0.0	61	87.2	59.08	.0001
• Incomplete answers	10	14.3	7	10		
• Incorrect or don't know	60	85.7	2	2.8		
Diagnoses of stroke						
• Complete correct answers	1	1.4	64	91.5	61.56	.0001
• Incomplete answers	19	28.2	5	7.1		
• Incorrect or don't know	50	71.4	1	1.4		
Complications of stroke						
• Complete correct answers	0	0.0	60	85.7	57.84	.000
• Incomplete answers	7	10	8	11.4		
• Incorrect or don't know	63	90	2	2.9		
Prevent bleeding for elderly with stroke						
• Complete correct answers	1	1.4	59	84.4	79.32	.0001
• Incomplete answers	9	12.8	9	12.8		
• Incorrect or don't know	60	85.8	2	2.8		
Treatments of stroke						
• Complete correct answers	4	5.7	65	92.9	55.12	.0001
• Incomplete answers	21	30	5	7.1		
• Incorrect or don't know	45	64.3	0	0.0		
Prevention of stroke						
• Complete correct answers	0	0.0	61	87.2	60.68	.0001
• Incomplete answers	11	15.7	8	11.4		
• Incorrect or don't know	59	84.3	1	1.4		

*(P value = .0001)

Table (6): Total Knowledge Score Level of Informal Caregivers about Stroke pre/ post Intervention (n=70).

Total Knowledge Score	Pre		Post		χ^2	P
	No	%	No	%		
• Poor < 50%	59	84.3	3	4.3	66.52	.0001
• Fair 50- <75%	9	12.9	7	10		
• Good ≥ 75%	2	2.8	60	85.7		

Table (7): Informal Caregivers' Practices pre / post Intervention Provided to Elderly post Stroke (n=70).

Items	Pre						Post						χ^2	P
	Always		Sometime s		Rarely		Always		Sometimes		Rarely			
	No	%	No	%	No	%	No	%	No	%	No	%		
Range of motion	5	7.1	7	10	58	82.9	59	84.3	10	14.3	1	1.4	52.34	.001
Change position	10	14.3	15	21.4	45	64.3	56	80	12	17.1	2	2.8	29.32	.0001
Measure vital sings	0	0.0	3	4.3	67	95.7	55	78.6	14	20	1	1.4	27.64	.0001
Measures blood sugars if need	0	0.0	2	2.8	68	97.1	10	14.3	5	7.1	55	78.6	33.48	.0001
Give insulin injection if needed	0	0.0	10	14.3	60	85.7	15	21.4	0	0.0	55	78.6	57.64	.0001

Observe of dingers sings stroke	0	0.0	2	2.8	68	97.1	67	95.4	3	4.3	0	0.0	54.28	.0001
Create method of communication if elderly aphasia	0	0.0	1	1.4	69	98.6	65	92.9	4	5.7	1	1.4	18.76	.0001
Learn elderly stress management techniques	0	0.0	2	2.8	68	97.1	64	91.4	5	7.1	1	1.4	55.96	.0001
Give elderly medication on time	55	78.6	15	21.4	0	0.0	58	82.9	2	2.8	10	14.3	18.68	.001
Assist elderly person to apply ALDs	35	50	15	21.4	25	35.7	30	42.9	20	28.6	20	28.6	20.64	.001

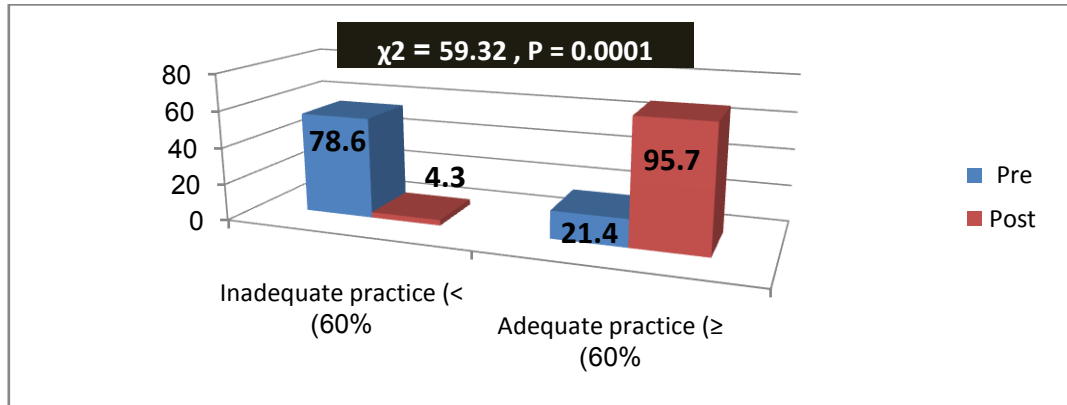


Figure (2) Informal Caregivers' Total Practices Score level about Care of Elderly Post Stroke Pre /post Intervention (n=70).

Table (8): The Association between Levels of Knowledge and Practices of Informal Caregivers about Stroke After Intervention (n=70)

Level of Knowledge	Level of Practices				χ ²	p-value
	Inadequate practices (< 60%)		Adequate practices (≥ 60%)			
	No	%	No	%		
• Poor	3	4.3	0	0	57.53	.0001
• Fair	0	0	7	10		
• Good	0	0	60	85.7		

*: Significant at p ≤ .05

DISCUSSION

Stroke is a common condition in later life affecting an estimated 9% of the US population age from 65 to 79 and 15% of those ages 80 and older. It is associated with greater disability and mortality with increasing age and often considered a disease of the older adults because approximately 60% to 75% of all strokes occur in those over the age of 65 ages [26]. The most common signs and symptoms of stroke are falling, urinary incontinence (UI), sleep disturbances, depression, gait impairment, and cognitive deficits. Together these may ultimately lead to higher rates of recurrent hospitalization, longer lengths of hospital stay, poorer quality of life, increased costs, excessive caregiver strain, and death of the elderly [27].

As regarding age of elderly persons, the present study findings showed that the mean age of them was 64± 7.9 years. This finding was similar with Shebl and AbdElhameed [32] who study intitle "Impact of Informal Caregivers Training Program on Geriatric Patients' Functional Status and Post-Stroke Depression" in Mansoura, Egypt, they found that mean age of geriatric patients were 66± 8.5 years. On the others hand this result is disagreement

with Venketasubramanian N, [28] who studied "The Prevalence of Stroke among Chinese, Malay, and Indian" in Singapore", they found that stroke prevalence among older adults aged 65 and above said that the prevalence of 7.67% for adults aged 65 years. This might be due to physiological and health life changes happened to elderly persons which make them high risk for exposure to stroke.

Also, the study showed that around two thirds of elderly persons post stroke were males. This finding was in the same line with, Tiana et al. [29], who study title "The Effects of Gender on Gene Expression in the Blood of Ischemic Stroke Patients" carrying out a study at Davis. Institute and Department of Neurology, and the National Institute of Neurological Disorders and stroke [30], who reported that, gender also plays a role in risk for stroke, men have a higher risk for stroke, but more women die from stroke and the stroke risk for men is 1.25 times than for women. Also, incongruent with Qureshi et al. [31] who study was conducted at Medical department of Peoples Medical College & Hospital Nawabshah, they studied the stroke frequencies of intra-cerebral bleed, cerebral infarction and subarachnoid hemorrhage and showed that, from 100 cases there were 44 cases of the studied sample were males and 56 cases were

females. From the investigators view this might be due to males are more prone to hypertension which was the first cause of stroke.

Concerning to income the results of the present study showed monthly income was insufficient. These findings were agreement with Sureshkumar^[33] who studied in India study rehabilitation needs of stroke survivors after discharge from hospital, they found that the lack of finances due to either reduced family income or excessive expenses led to discontinuation of treatments and rehabilitation that obviously increased the risk of delay in recovery, and to complications and subsequent stroke attacks.

Regarding post and present medical history of elderly persons the present study showed that majority of elderly admitted hospital once, three quarter of them had hypertension disease and take anti-thrombolytic, anti-coagulants, and anti-hypertensive drugs. These result agree with Cantu *et al.*^[35] in study title "Interventions for caregivers of stroke survivors" who mention that the prevalence of diagnosed HT among elderly was 73.0%, which is very similar to the 68.3% recorded in another population-based study in Spain.

The results of the present study revealed that statistically significant enhancements in elderly persons post stroke activities of daily living, after applying intervention than pre ($P < 0.05$) in all items except feeding, transfer and stairs. A similar finding to the present study also was presented in a study done by AbdElhameed^[8] & Hadidi^[34], who found that clients post stroke activities of daily living (ADLs) improved after intervention. While, Eftekhar^[44] they report that the majority of Iranian post stroke clients surveyed required assistance with activities of daily living (ADLs). This finding supports existing literature that shows education and information regarding the nature of stroke, recovery, and secondary prevention are key components of skill development^[35]. From the investigators view the improvement in elderly persons post stroke activities of daily living due to effectiveness of treatment, planned follow-up and the effectiveness of the health promotion intervention which gives the elderly persons and their informal caregivers that focused on information, motivation, and skill practices on post-stroke care needed and helped them to be competent care need for daily living and therefore save effort and time needed for nursing care as well as increase of self-confidence of the elderly persons.

Hence the research hypothesis (H1) which stated that elderly persons post stroke activity of daily living will be improved after applying the health promotion intervention.

The study's results cleared that statistically significant enhancement in informal caregivers' psychological status, in the post intervention than pre ($P < 0.05$). A similar finding to the present study also was presented in a study done by Galvin (2011)^[38], who studied in Ireland, report that the caregivers of patients in the mild and moderate experimental subgroups showed a significant increase in satisfaction and psychological status. Form the investigators opinion the training caregivers to deal with elderly post stroke reduces their burden, anxiety, and depression and improves quality

of life to informal caregivers. Also it improved care provided to elderly persons post stroke.

The current study revealed that, knowledge of informal caregiver pre and post health promotion intervention about stroke was highly statistically significant enhancements in knowledge of the studied sample, regarding stroke in the post - health promotion intervention than pre ($P < 0.001$). This finding was congruent with a study carried out by Hamad^[36], who studied in Qatar and also the study carried out by Abd El Ghany^[37], The study was conducted at the out-patient of the neurological clinic on Asser General Hospital at Abha city Saudi Arabia, they found in their studies a significant improvement in knowledge and practices after health education sessions whether in post-test one or two compared to their initial assessment done through the pre-test.

As regarding informal caregivers' practice pre and post health promotion intervention provided to elderly person post stroke, there were statistically significant improvements in the informal caregivers' practice in the post- intervention than pre, ($P < 0.001$). This finding was congruent with Shebl & Abdel-Hameed (2014)^[32], in study title "The Impact of Informal Caregivers Training Program on Geriatric Patients' functional status and post stroke depression" who reported that before application of the training program all caregiver's knowledge and practice level was poor, while immediately after the implementation of the training program, the level of knowledge and practices improved to a great extent. A highly statistically significant difference was found between total knowledge and practices score pre and post the implementation of the program.

Also this finding was congruent with Abd El Aziz *et al.*, (2013)^[40], in study was conducted at out-patient of the neurological clinic on Asser General Hospital at Abha city Saudi Arabia, they reported that the differences in total knowledge of caregivers about stroke disease were highly statistically significant between pre, and post program. On the others hand this finding incongruent with Abdel-Hameed *et al.*, (2010)^[41], who reported that more than two-thirds of the stroke patient caregivers had poor skills about practices after the training program.

Regarding to Informal caregivers' total knowledge and total practices score about care of elderly post stroke, in the current study there was highly statistically significant differences between total scores knowledge and total score practices of informal caregivers regarding stroke post health promotion intervention. This finding was congruent with Helmey (2013)^[42], who studied was conducted at Benha University Hospital who reported that there were highly statistically significant relations between socio-demographic and total knowledge and needs of the study patients. Also this finding contraindicated with Ramirez-Moreno *et al.*, (2015)^[43], in their study conducted on population of Extremadura, Spain, who reported that there were low significant differences regarding response to stroke or to its warning signs.

The above mentioned results proved the research hypothesis (H2), which revealed that informal caregivers' knowledge

&practices about needs and care to elderly person post stroke will be improved after applying health promotion intervention.

The study found that knowledge, and practices of informal caregivers were poor and needed to be improved. This study was carried out to test the research hypotheses thatthere was a significant improvement in elderly persons postactivity of daily living and informal caregivers' knowledge & practices about care needed to elderly persons post strokeafter applying health promotion intervention.

CONCLUSION

In the light of the present study findings, it can be concluded that, elderly persons' activity of daily living post stroke improved after implement the health education intervention.And informal caregivers' knowledge & practices about needs and care to elderly person post stroke improved after health education intervention.So by that finding the study results supported the two research hypotheses.

RECOMMENDATIONS

- ❖ Health promotion intervention for stroke management should be performed at the outpatient clinics by using booklets, posters and other mass media to improve caregivers' knowledge and practices regarding stroke and its managements to be planned by nurse and gerontology specialists in hospitals and offered on a regular basis.
- ❖ A similar study can be replicated by a nurse researcher of the neurological out patient's clinics at anther setting to evaluate caregivers' knowledge and practices toward elderly persons with stroke and its managements.

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CONFLICT OF INTEREST

The authors declare that they have no conflict of interest.

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