Novelty Journals

ISSN 2394-7330

International Journal of Novel Research in Healthcare and Nursing
Vol. 6, Issue 1, pp: (765-785), Month: January - April 2019, Available at: www.noveltyjournals.com

The Effect of an Educational Program on the Elderly with Stroke and their Family Caregivers Based on Transitional Care Model

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Abstract: **Stroke is the most serious life threatening disease that affects individuals at any age but it's most common among the elderly. It affects the elderly physically, mentally and psychologically, so they require continuous care, especially from their family caregivers. Aim of the study: Was to evaluate the effect of an educational program on the elderly with stroke and their family caregivers based on transitional care model. Subjects and method: A quasi - experimental research design was utilized in this study. This study was conducted at neurological department and at neurological outpatient clinics at Tanta University hospitals. Study subject: A convenient sample of 50 elderly patients with stroke and 50 family caregivers were included in the study. Two tools were used in this study. Tool I: An interview schedule consisted of four parts. Tool II: Applied transitional care model consisted of six parts. Results: Total knowledge, mental status and quality of life, level of depression, activities of daily living and instrumental activities of daily living scores of the studied elderly patients were significantly improved post program intervention than the preprogram. Furthermore, the studied family caregivers also showed significant improvement in the total knowledge and practices scores immediately and three months post program intervention than the preprogram intervention. Conclusion and recommendations: the educational program was effective and improved the level of knowledge and practices of the stroke patients and their family caregivers. Therefore, educational programs should be planned and offered at regular basis to all stroke patients and their caregivers to improve their knowledge, practices and quality of life.**

Keywords: **Stroke - Elderly patients - Family caregivers - Transitional care model.**

1. INTRODUCTION

Stroke is the most common life threatening neurologic disease and the third leading cause of death after heart disease and cancer. Stroke occurs at any age, it can occur in children and younger persons but it is most common among the elderly persons. The risk of stroke doubles with each passing decade after the age of 55 years [(1-4)].

According to the World Heart Federation in 2016, every year, 15 million people worldwide suffer from stroke. Nearly six million die and another five million are left permanently disabled. According to the Official National Statistics in Egypt in 2013, stroke considered the primary cause of death and account for one-third of all deaths. Where stroke accounts for 6.4% of all deaths, and followed closely by cancer which accounts for 6.1% of all deaths [(5-7)].

Strokes occur quickly as well as the symptoms of stroke often appear suddenly without warning, the most common signs and symptoms of stroke are sudden numbness, weakness of the face, arm, or leg, sudden confusion or trouble speaking or understanding others, sudden trouble seeing in one or both eyes, sudden dizziness, trouble walking, or loss of balance or coordination and sudden severe headache with unknown cause [(8-10)].

Persons with stroke often experience physical, cognitive, and emotional problems that limit their functional capacity [9]. Functional incapacity can create difficulties for the elderly in carrying out daily activities which may be transient or permanent depending on the region of the brain affected, the level of the lesion and the individual capacity for recuperation following stroke. These difficulties can lead to reduction in quality of life with an impact on the everyday routine of the elderly persons and their family [11-13].

Family caregivers have important role in the process of caregiving of elderly patients with stroke. Where the elderly patients with stroke are dependent fully in the family caregivers and need meticulous care during hospitalization, during discharge and at home. So that, it is necessary for all family caregivers to be involved in all aspects of caring of elderly patients with stroke [11,14].

The Transitional Care Model (TCM) designed by Naylor in 1990 and a multidisciplinary team of colleagues at the University of Pennsylvania. It provides comprehensive hospital planning and home follow up for chronically ill high-risk older adults hospitalized for common medical and surgical conditions including elderly patients with stroke [15].

Community health nurse has important and crucial role in caring of elderly patient with stroke. Care of the stroke can be divided into three phases, **phase one** or initial care, which nursing activity is directed toward maintain the elderly patient vital functions and facilitating survival of the cerebral assaults. **Phase two**, which are concerned with rehabilitation efforts. **Phase three**, during which community health nurse make plan for continuity of care for elderly patient with stroke and prepare the patient to returns home [8, 16-18].

Stroke is most common among elderly and its incidence increase markedly with advancing age. Stroke has negative impact on the elderly persons and their family caregivers physically, socially and psychologically [1,2,9]. Therefore the aim of this study was to evaluate the effect of an educational program on the elderly with stroke and their family caregivers based on transitional care model.

Aim of the study

The aim of this study was to:

Evaluate the effect of an educational program on the elderly with stroke and their family caregivers based on transitional care model.

Research Hypothesis:

The research hypothesis was met as the level of knowledge and practice of the elderly and their family caregivers regarding stroke improved after implementation of an educational program based on transitional care model.

2. SUBJECTS AND METHOD

Study design: A quasi - experimental research design was utilized in this study.

Study setting: This study was conducted at neurological department and neurological outpatient clinics at Tanta University hospitals.

Study subjects: A convenient sample of 50 elderly patients with stroke and their family caregivers attending the previous setting were included in the study (50 elderly patients with stroke and 50 family caregivers). **The following inclusion criteria were used for selecting the sample:** Aged 60 years and above, included both sexes and able to communicate and accept to participate in the study.

Tools of the study:-

In order to collect the necessary data, two tools were used in this study according to the adapted transitional care model.

Tool I: - An interview schedule: it included the following parts:-

Part I: Bio-socio-demographic characteristics & health history of the elderly patients with stroke.

This included data about age, sex, marital status, occupation, level of education, income and its source and place of residence. Health history of the elderly as: date of hospital admission, number, and causes of previous hospitalization,

types of chronic diseases and type of medication taken for it, history of stroke, onset of disease, duration of disease, affected side, number of recurrence, type of treatment, and medication received.

Part II: Socio-demographic characteristics of the elderly patients' family caregivers.

It included data about caregivers as: age, sex, marital status, occupation, level of education, and their relative degree with the elderly.

Part III: knowledge of the elderly patients and their family caregivers regarding stroke [8-14].

This part was developed by the researcher to assess elderly patients and their caregivers' knowledge about stroke. It covered the following areas: definition, causes, risk factors, signs and symptoms, complications, preventions, and treatment of stroke, importance of follow-up, and the available community health services for stroke patients.

The scoring system: The items of the questionnaire were checked with a model key answer, which were prepared by the researcher. Each correct point of answer was given score one while incorrect answer and don't know were given score zero.

The total score of knowledge was calculated by summation of the score of all questions related to knowledge about stroke and it equaled 58 points. The total amount of score summation of each elderly patient or family caregivers were divided by maximum score of knowledge and multiplied by 100 to get the total score percentage.

The scoring system of knowledge was classified into:-

- Poor knowledge < 50 % of the total score of knowledge.
- Fair knowledge 50 < 70 % of the total score of knowledge.
- Good knowledge ≥ 70 % of the total score of knowledge.

Part IV: - Practices of the studied family caregivers [11]:

This part was developed by the researcher to assess the level of practices of care provided by caregivers for elderly patients with stroke by using observational checklist and reported practice before and after implementation of the program. It included items related to: proper use of assistive devices, skills in moving the elderly, skin care, bladder care, bowel care, and communication skills.

The scoring system for practices

- It was made using a 3-point Likert like scale, a zero (0) score for the items which that wasn't done, one score for the items that was done incorrectly and two score for the items that was done correctly.

- These scores were summed up and the total score equal 104 points then converted into a percent score. The higher score indicated a greater level of elderly patient's caregivers' practices.

The scoring system for practices was classified into:

- Unsatisfactory practice < 60 % of the total score of practices.
- Satisfactory practices ≥ 60 % of the total score of practices.

Tool II: -Applied Transitional Care Model [15]:

The Transitional Care Model (TCM) designed by Mary Naylor and a multidisciplinary team of colleagues in 1990 and updated in 2013-2014, at the University of Pennsylvania which addressed the negative effects associated with common breakdowns in care when older adults with complex needs transition from an acute care setting to their home or other care setting, also prepared patients and family caregivers to more effectively manage changes in health associated with multiple chronic illness. It included the following parts:-

Part I: Short Portable Mental Status Questionnaire (SPMSQ) [19]:

The Short Portable Mental Status Questionnaire (SPMSQ) measured intellectual function by assessing response to 10 items. The questionnaire was scored one for correct response or zero for incorrect response.

Scores ranged from 0-10. For 0 – 2 errors = intact intellectual functioning, for 3 – 4 errors = mild intellectual impairment, for 5 – 7 errors = moderate intellectual impairment and for 8 – 10 errors = severe intellectual impairment.

Part II: Mini-Mental State Examination (MMSE) [20]:

The Mini Mental State Examination (MMSE) was a tool that can be used to systematically and thoroughly assess mental status. It consisted of eleven questions which measure five areas of cognitive function such as: orientation (10 points), registration (3 points), attention and calculation (5 points), recall (3 points), and language (9 points).

The total score ranged from 0 to 30. The maximum score was 30 and it was classified into:-

- No cognitive impairment for the score 25 - 30.
- Mild cognitive impairment for the score 20 - 24.
- Moderate cognitive impairment for the score 10 - 19.
- Sever cognitive impairment for the score 0 – 9.

Part III: Geriatric Depression Scale (GDS) [21]:

This scale developed by Kurlowicz and Wallace in 1999 specifically for the elderly and standardized on elderly samples. It consisted of fifteen item self-report instrument in a "yes" or "no" format. Each item was scored zero or one depending upon whether the item was worded positively or negatively. For the items (2 - 4, 6, 8 - 10, 12, 14 and15) the scoring was yes = 1 and no = 0, where the items (1, 5, 7, 11and 13) were reversed scored as no = 1 and yes = 0.

The total score ranged from 0 to 15. Scores of (0 – 5) were normal for non-depressed responders, scores of (6 - 10) indicated mild depression, and score of (11- 15) indicated moderate to severe depression.

Part IV: Instrumental Activities of Daily Living (Lawton's IADL) [22]:

Lawton's instrumental activities of daily living Scale developed in 1969. It was used to assess independent living skills of an individual and measures functional ability as well as declines and improvements over time. It was assessed 8 domains of function like telephoning, shopping, food preparation, housekeeping, laundering, use of transportation, use of medicine and financial behavior. Women were scored on all 8 areas of function but, for men the areas of food preparation, housekeeping and laundering were excluded.

Elderly patients were scored according to their highest level of functioning in that category (for each independent item one point score and for each dependent item zero point score).

The total score was ranged from (0-8) for women and from (0-5) for men. A score 0 (low function, dependent), 1-7 (mild to moderate function, dependent) and 8 (high function, independent) for women, while men 0 (low function, dependent), 1- 4 (mild to moderate function, dependent) and 5 (high function, independent).

Part V: Katz Activities of Daily Living (Katz ADL) [23]:

Katz Activities of Daily Living (ADL) index measured ability to conduct self-care. It consisted of six-item instrument which assessed the independence or dependence in the activities of bathing, dressing, toileting, transferring, continence and feeding.

Elderly patients were scored yes/no for independence in each of the six functions. Scores ranged from 0-6, a score of 6 indicated full function, a score of 3- 5 indicated moderate impairment and a score of 2 or less indicated severe functional impairment.

Part VI: World Health Organization Quality of Life-BREF (WHOQOL- BREF) [24]:

WHOQOL-BREF was an abbreviated generic quality of life scale developed by the World Health Organization in 1997. The WHOQOL-BREF instrument comprised of twenty six items. The twenty six standard items contain two generic items (over all QOL and general health) and the remaining twenty four items could be further classified into four domains:

physical health included seven items (items 3, 4, 10, 15, 16, 17 and 18), where psychological included six items (5, 6, 7, 11, 19 and 26), social relationships included three items (20, 21 and 22). Finally, environment included eight items (8, 9, 12, 13, 14, 23, 24 and 25).

The score ranged from 26-130. The twenty six which referred to (the worst possible QOL) and 130 referred to (the best possible QOl).

Scoring system was modified by the researcher to be as follows:-

Poor quality of life: (26 - < 52) Fair quality of life: (52 - < 78)

Good quality of life: (78 - <104) Excellent quality of life: (104-130)

Method

The operation of this study was carried out as follows:-

1- Administrative approval:-

- An official permission to conduct the study was obtained from the Dean of the Faculty of Nursing and directed to the manager of Tanta University hospitals and the director of neurological department of Tanta university hospitals.
- Director of neurological department of Tanta university hospitals was informed about the objectives of the study to take their permission to collect data from the selected settings.

2- Ethical and legal considerations:-

- An approval from the ethical committee in the faculty of nursing was obtained on the proposal of the study.
- An informed consent was obtained from all study subjects after providing appropriate explanation about the purpose of the study.
- Each participant was informed that he/she had the right to withdraw from the study at any time he/she wants.
- Nature of the study did not cause any harm or pain for the entire sample.
- Confidentiality and privacy were put into consideration regarding the data collected.

3- Developing the tools:-

- Tool I of the study was developed by the researcher based on literature review (Part I, II, III and IV).
- Tool II of the study was used by the researcher based on transitional care model developed by Mary Naylor and a multidisciplinary team of colleagues in 1990 and updated in 2013-2014, at the University of Pennsylvania [(26)].
- The study tools were tested for its face and content validity by a jury of five professor expertise (Three expertises in the Community Health Nursing and two expertises in the Public Health and preventive Medicine) before conducting the study.

4- The study tools were tested for its reliability by using Chronabach's alpha test, it was computed and it was found to be = (0.931) for all the study tools. **The pilot study:-**

- A pilot study was carried out by the researcher on 10% of the sample for testing the tool/s for its clarity, applicability and to identify obstacles that may be encountered with the researcher during data collection. Accordingly, the necessary modification was done. This sample was excluded from the study.

5- The actual study:-

- Elderly patients and their family caregivers were interviewed by the researcher at neurological department one week before discharge according to the pre-determined date and time coordination with the director and participants. Then follow up to them was done in outpatient clinics.
- The researcher designed the educational intervention program about stroke and caring of the elderly based on Transitional Care Model, which included the following steps:

1- Developing the educational program:

The following phases were adopted to develop the program.

I- Assessment phase:

The data was collected by the previously mentioned tools through interviewing each elderly and their family caregivers individually in pre-determined setting to collect the baseline data as a pre-intervention assessment.

II- Planning phase:

The education program planned according to elderly patient and their family caregiver's needs obtained from the assessment phase and through literature review. The planning phase included the following parts:-

a- Formulating program objectives

- **The goal of the program**: was to enable elderly patient to live with sequences of the stroke and their family caregivers to gain knowledge and skills that help them in providing care for elderly with stroke and help in prevention of stroke recurrence.

b- Preparing and organizing the program content

- Based on the elderly patients with stroke and their family caregivers' needs which were determined in the preprogram assessment and the objectives of the program, the researcher reviewed the related literature that covered the various aspect of the problem.

- The health education program was developed by the researcher based on the results obtained from the interviewing sheet, as well as literature review.

- The content of the program was organized in six sessions to be provided for the study group. **The sessions were as follow:**

Session 1: Program orientation and expectation.

The aim of this session was to orient the elderly patient and their family caregivers about the importance of the program and to assess their expectations from each session.

Session 2: An overview about stroke.

The aim of this session was to increase the elderly patient and their family caregivers' knowledge about definition, causes, risk factors, signs and symptoms of stroke.

Session 3: Types, complications and prevention of stroke.

The aim of this session was to inform the elderly patient and their family caregivers about the classification, complication and measures needed to prevent subsequent stroke.

Session 4: Nutrition and medication education about stroke. The aim of this session was to discuss with family caregivers the suitable nutrition for elderly patient with stroke and types of received medication.

Session 5: Skills of moving the elderly and using of the assistive devices.

The aim of this session was to educate the family caregivers how to move the elder patients, safety measures to prevent falls and common assistive devices used for elderly with stroke.

Session 6: Skin, bowel and bladder care of the elderly with stroke.

The aim of this session was to demonstrate to the family caregivers the practical skills for skin, bowel and bladder care to prevent pressure ulcer, fecal impaction and urinary tract infection, communication skills and available community health services for elderly with stroke in Tanta.

c- Selecting the teaching strategies

- Lectures, discussions**,** booklet and demonstration were used as teaching methods.

1- **Lectures** were presented in a simple language and in a concise manner.

2- **Group discussion** allowed the researcher to explore the main ideas to be discussed and also helped the researcher to offer practice in verbal expression. It helped elderly patients with stroke and their family caregivers to talk freely about their problems, share information, encourage understanding and feedback. In addition, the researcher was able to direct the group by asking stimulating questions listen to all comments and summarize the important facts from time to time.

3- **Demonstration and re-demonstration** were used to illustrate the important procedure for caring of elderly with stroke e.g. moving the elderly, exercise to the affected part, using assistive walking devices (wheel chair, walker and cane) and skin care. Enough time was offered for interpretation, re – demonstration and discussion.

- Power point presentation, pictures, assistive devices, videos and handouts like (colored booklet and brochure) were used as teaching aids.

D- Preparation done before program implantation.

- **Pre – requisites:**

- Human resources

The program was totally carried out by the researcher, this to ensure providing complete, consistent and accurate knowledge about stroke, its management and prevention of stroke recurrence to the elderly patients and their family caregivers.

- Non-human resources

Developing the audiovisual materials used in this study in order to increase the elderly patients and their family caregivers' knowledge about stroke and to improve their practice regarding care of the elderly with stroke. These materials included booklet for elderly patients and their family caregivers (Appendix) and power point slides. The booklet and power point were prepared by the researcher based on literature review. Booklets were distributed to the studied sample at the end of the sessions to refresh their knowledge and the power point was presented during each session as needed.

E- Preparation was done before each teaching session.

1- Ensuring that audiovisual materials were in good condition.

2- Arranging the training place (the patient word in hospital especially near each patient bed).

3- Ensuring that the main family caregivers were present before starting each session.

III- Implementation phase:

- Implementation of the program was carried out at neurological department and neurological outpatient clinics at Tanta University hospitals.

- The researcher introduced herself to the study group and took their consent to participate in the study after that every patient and his /her family caregivers were informed about the purpose and benefits of the study at the beginning of the interview.

- The researcher met with the elderly patient and his family caregiver at neurological department before discharge from the hospital all days of the week except Friday. Then the researcher met them during follow up visit at neurological outpatient clinic and through telephone call. The field work of this study started from March to December 2017, about ten months to be distributed as follow: assessment and planning phase (start from the first of March to the end of June 2017), implantation phase (start from the first of July to the end of September 2017) and the evaluation phase (start from the first of October to the end of December 2017).

- The average number was taken from the elderly patients and their family caregivers was ranged from 1-2 cases per day and each session was given to each patient and his/her family caregiver at the same time.

- Elderly patients with stroke and their family caregivers were present in all six sessions of the program about (300 minutes), each session take time from 45 – 60 minutes.

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Vol. 6, Issue 1, pp: (765-785), Month: January - April 2019, Available at: www.noveltyjournals.com

- The program was implemented to the elderly patient and their family caregivers together to ensure that they were exposed to the same learning experience, as well as to the same learning content and to the same teaching methods.

- Each session started by summary of what was given in the previous session, also group discussion about topic and specific objectives of the present session.

- Booklet of stroke educational program was distributed to all participants to use it as a future reference.

IV-Evaluation phase:

The aim of this phase was to evaluate the effectiveness of the educational intervention program on knowledge and practice of the elderly patients and their family caregivers. Therefore, the interview sheet was introduced to the studied subjects three times:

1- First time (pre-test): Before implementation of the health education program using (tools I and II).

2- Second time: Immediately after implementation of the health education program using tools (tool I part III and IV and tool II).

3- Third time: After three months of implementation of the health educational program using tools (tool I part III and IV and tool II).

6- Statistical analysis of the data:-

The statistical data were organized, tabulated and statistically analyzed using statistical package for social studies (SPSS) version 23. For categorical data the number and percent were calculated and the differences between subcategories were tested by chi square (X^2) through Friedman test. When chi square was not appropriate Wilcoxon test was used. For numerical data the range, mean and standard deviation were calculated. For comparison for more than two means the F variance of repeated measures analysis was used and for comparison of two means paired sample t test was used. Correlation between variables was evaluated using Pearson's correlation coefficient (r). The level of significant was adopted at $p < 0.05$ for interpretation of results of tests of significance.

3. RESULTS

Table (I): Distribution of the studied elderly patients according to their socio- demographic characteristics

Variables	The studied elderly patients (n=50)	
	n	%
Age in years		
60 < 70	33	66.0
70 < 80	13	26.0
More than 80 years	4	8.0
Range	60-92	
Mean ± SD	67.14 ± 7.923	
Sex		
Male	26	52.0
Female	24	48.0
Marital status		
Single	1	2.0
Married	32	64.0
Widow	17	34.0
Occupation before retirement		
Not working (Housewife)	23	46.0
Working	27	54.0
Education		
Illiterate or read and write	34	68.0
Elementary education	6	12.0
Secondary education	4	8.0

Novelty Journals

ISSN 2394-7330

International Journal of Novel Research in Healthcare and Nursing
Vol. 6, Issue 1, pp: (765-785), Month: January - April 2019, Available at: www.noveltyjournals.com

University education& more	6	12.0
Family income		
Just enough	46	92.0
Not enough	4	8.0
Residence		
Rural	38	76.0
Urban	12	24.0
Number of family caregivers		
1-2	30	60.0
3-4	18	36.0
5-6	2	4.0
Range	1 – 6	
Mean ± SD	2.5 ± 1.282	
Mean family caregiver		
Wife	16	32.0
Daughter	17	34.0
Son	8	16.0
Step daughter	9	18.0

Table (I): represents the distribution of the studied elderly patients according to their socio- demographic characteristics. This table showed that the age of the studied elderly patients ranged from 60- 92 years with a mean of 67.14 ± 7.923 years and about two - thirds of them (66%) their age ranged from 60 < 70. Slightly more than half of them (52%, 54%) were male and working before retirement respectively. About more than two - thirds of the studied elderly patients (64%, 68%) were married and illiterate or read and write respectively.

Concerning family income the majority of them (92%) mentioned that their income just enough while only (8%) reported that their income wasn't enough. In relation to residence slightly more than three - quarters of them (76%) were living in rural areas. Regarding number of the elderly patients' family caregivers, it ranged from 1-6 family caregivers with a mean of 2.5 ± 1.282 caregivers. About one - third of them (34%, 32%) reported that the main family caregivers were daughter and wife respectively.

Table (II): Distribution of the studied elderly patients according to their present attack of stroke

Variables	The studied elderly patients (n=50)	
	n	%
Type of present stroke		
Hemorrhagic stroke	17	34.0
Ischemic stroke	33	66.0
Affected side of the brain		
Right side	25	50.0
left side	25	50.0
Medical intervention immediately after stroke		
Medication and IV infusion	48	96.0
Surgical treatment	2	4.0
Medication used for stroke now		
Clot busting medication	33	66.0
Blood vessels strengthen medication	17	34.0

Table (II): this table illustrated that about two - thirds of the studied elderly patients (66%) had ischemic stroke while about one - third of them (34%) had hemorrhagic stroke. Concerning the affected side of the brain, half of the studied elderly patients (50%) had the right side affected and the other half (50%) had the left side affected.

Regarding the medical intervention immediately after stroke, the majority of the studied elderly patients (96%) reported that they were taken medication and IV infusions while only (4%) were undergone surgical treatment. In relation to medication used for stroke now, about two - thirds of them (66%) were taken clot busting medication compared to one - third of them (34%) were taken blood vessels strengthen medication.

Novelty Journals

ISSN 2394-7330

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Table (III): Distribution of the studied elderly patients throughout the study phases regarding to their total knowledge score

Variables	The studied stroke elderly patients					
	Pre intervention (I) (n= 50)		Immediate post intervention (II) (n= 50)		Three months post intervention (III) (n= 50)	
	N	%	n	%	n	%
Good	0	0.0	45	90.0	40	80.0
Fair	0	0.0	5	10.0	10	20.0
Poor	50	100.0	0	0.0	0	0.0
X^2 P	97.097 0.001*					
Range	0-4		29-54		29-53	
Mean ± SD	0.40 ± 1.030		45.44 ± 4.416		43 ± 4.982	
F P	1789.056 0.001*					

*Significant at (p < 0.05)

Table (III): This table presented that, There was a significant improvement of the total knowledge score of the studied elderly patients during pre, immediate and three months post program intervention (p<0.05), where the mean scores of their knowledge increased from 0.40 ± 1.030 in pre-program intervention to 45.44 ± 4.416 immediate post intervention and to 43 ± 4.982 three months post intervention. This difference was a statistically significant (F= 1789.056).

Table (IV): Distribution of the studied elderly patients throughout the study phases regarding to their mental status according to short portable mental state questionnaire

Variables	The studied stroke elderly patients						X^2 P
	Pre intervention (I) (n= 50)		Immediate post intervention (II) (n= 50)		Three months post intervention (III) (n= 50)		
	n	%	n	%	n	%	
Intact intellectual skills	16	32.0	27	54.0	44	88.0	59.579 0.001*
Mild intellectual impairment	7	14.0	21	42.0	6	12.0	
Moderate intellectual impairment	25	50.0	2	4.0	0	0.0	
Sever intellectual impairment	2	4.0	0	0.0	0	0.0	
Range	1-10		1-7		1-4		
Mean ± SD	2.26 ± 0.965		1.46 ± 0.579		1.12 ± 0.328		
F P	39.031 0.001						

*Significant at (p < 0.05)

Table (IV): represents the distribution of the studied elderly patients throughout the study phases regarding to their mental status according to short portable mental state questionnaire. This table showed that, there was a statistically significant improvement of the mental status of studied elderly patients during pre, immediate and three months post program intervention (P < 0.05), where the mean score of their mental status error decreased from 2.26 ± 0.965 during

pre-program intervention to 1.46 ± 0.579 immediately post program intervention and 1.12 ± 0.328 during three months post program intervention with a statistically significant difference (F = 39.031, P < 0.05).

Table (V) Distribution of the studied elderly patients throughout the study phases regarding to their mental status according to mini mental state questionnaire

Variables	The studied stroke elderly patients						X^2 P
	Pre intervention (I) (n= 50)		Immediate post intervention (II) (n= 50)		Three months post intervention (III) (n= 50)		
	n	%	n	%	n	%	
No cognitive impairment	14	28.0	27	54.0	45	90.0	62.595 0.001*
Mild cognitive impairment	12	24.0	21	42.0	4	8.0	
Moderate cognitive impairment	24	48.0	2	4.0	1	2.0	
Range	1 - 4		1 – 4		1 – 4		
Mean ± SD	2.20 ± 0.857		1.50 ± 0.580		1.12 ± 0.385		
F P	43.094 0.001						

*Significant at (p < 0.05)

Table (V): represents the distribution of the studied elderly patients throughout the study phases regarding to their mental status according to mini mental state questionnaire. This table showed that there was a statistically significant improvement of the mental status of studied elderly patients during pre, immediate and three months post program intervention (P < 0.05), where the mean score of their mental status error decreased from 2.20 ± 0.857 during pre - program intervention to 1.50 ± 0.580 immediately post - program intervention and 1.12 ± 0.385 during three months post - program intervention with a statistically significant difference (F = 43.094, P < 0.05).

Table (VI): Distribution of the studied elderly patients throughout the study phases regarding to their level of depression according to geriatric depression scale

Variables	The studied stroke elderly patients				Z P
	Pre intervention (n= 50)		Three months post intervention (n= 50)		
	n	%	n	%	
Normal (No depression)	24	48.0	48	96.0	4.707 0.001*
Mild depression	26	52.0	2	4.0	
Moderate to severe depression	0	0.0	0	0.0	
Range	0 – 10		0 – 10		
Mean ± SD	1.52 ± 0.505		1.04 ± 0.198		
T P	6.244 0.001				

*Significant at (p < 0.05)

Table (VI): represents the distribution of the studied elderly patients throughout the study phases regarding to their level of depression according to geriatric depression scale. This table showed that there was a statistically significant improvement of the level of depression of the studied elderly patients during pre and three months post program intervention (P < 0.05), where the mean score of their level of depression decreased from 1.52 ± 0.505 during pre-program intervention to 1.04 ± 0.198 during three months post program intervention with a statistically significant difference at (t = 6.244, P < 0.05).

Novelty Journals

ISSN 2394-7330

International Journal of Novel Research in Healthcare and Nursing
Vol. 6, Issue 1, pp: (765-785), Month: January - April 2019, Available at: www.noveltyjournals.com

Table (VII): Distribution of the studied elderly patients during pre and three months post program intervention regarding to their level of independency in performance of instrumental activities of daily living

Variables	The studied stroke elderly patients				Z p
	Pre intervention (n= 50)		Three months post intervention (n= 50)		
	n	%	n	%	
Low function dependent for men and women	18	36.0	1	2.0	4.820 0.001*
Mild to moderate function for women	11	22.0	20	40.0	
High function independent for women	1	2.0	3	6.0	
Mild to moderate function for men	18	36.0	17	34.0	
High function independent for men	2	4.0	9	18.0	
Range	0 – 8		0 – 8		
Mean ± SD	1.50 ± 1.403		2.26 ± 1.226		
t **P**	5.866 0.001				

*Significant at (p < 0.05)

Table (VII): this table showed that more than one third of the studied elderly patients (36%) had a low function (dependent) and only (2% and 4% respectively) of them had a high function independent for men and women during pre-program intervention. On the other hand, during three months post - program intervention the percentage of the studied elderly patients who had a low function (dependent) decreased to (2%) and the number of those with a high function (independent) for men and women increased to (6% and 18% respectively) with a statistically significant improvement (P < 0.05).

The mean score of their instrumental activities of daily living increased from 1.50 ± 1.403 during pre-program intervention to 2.26 ± 1.226 during three months post program intervention. This difference was a statistically significant at (t= 5.866, P < 0.05).

Table (VIII): Distribution of the studied elderly patients pre and three months after program intervention regarding to their degree of independency in the performance of activities of daily living

Variables	The studied stroke elderly patients				Z p
	Pre intervention (n= 50)		Three months post intervention (n= 50)		
	n	%	n	%	
Severe functional impairment	31	62.0	10	20.0	4.976 0.001*
Mild to moderate impairment	9	18.0	15	30.0	
High patient function (highly independent)	10	20.0	25	50.0	
Range	0 - 6		0 – 6		
Mean ± SD	0.58 ± 0.810		1.30 ± 0.789		
t **P**	7.263 0.001				

*Significant at (p < 0.05)

Table (VIII): this table illustrated that, there was a statistically significant improvement in the level of independency in the activities of daily living among the studied elderly patients during pre and three months post program intervention (P < 0.05), where the mean total score of their independency in the activities of daily living increased from (0.58 ± 0.810) during pre-program intervention to (1.30 ± 0.789) during three months post program intervention with a statistically significant difference at (t= 7.263, p < 0.05).

Novelty Journals

ISSN 2394-7330

International Journal of Novel Research in Healthcare and Nursing
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Table (IX): **Distribution of the studied elderly patients pre and three months post program intervention regarding to their total score of quality of life**

Variables	The studied stroke elderly patients				Z P
	Pre intervention (n= 50)		Three months post intervention (n= 50)		
	N	%	n	%	
Excellent	1	2.0	20	40.0	
Good	22	44.0	27	54.0	5.938
Fair	26	52.0	3	6.0	0.001*
Poor	1	2.0	0	0.0	
Range	50 – 110		68 – 128		
Mean ± SD	77.06 ± 11.566		101.1 ± 11.908		
t	11.143				
P	0.001*				

***Significant at (p < 0.05)**

Table (IX): represents the distribution of the studied elderly patients during (pre and three months post program intervention) regarding their total score of quality of life. This table showed that there was a significant improvement of the total score of quality of life of the studied elderly patients during pre and three months post program intervention ($p<0.05$), where the mean scores of their quality of life increased from 77.06 ± 11.566 during pre-program intervention to 101.1 ± 11.908 during three months post intervention. This difference was a statistically significant ($t= 11.143$, $p = 0.001$).

Table (X): Distribution of the studied family's caregivers according to their socio- demographic characteristics

Variables	The studied family caregivers (n=50)	
	n	%
Age in years		
21 - 30	15	30.0
31 - 40	10	20.0
41 – 50	15	30.0
More than 50 years	10	20.0
Range	21 – 62	
Mean ± SD	39.54 ± 11.33	
Sex		
Male	9	18.0
Female	41	82.0
Marital status		
Single	5	10.0
Married	45	90.0
Widow	0	0.0
Occupation		
Not working (housewife)	34	68.0
Working	16	32.0
Level of education		
Illiterate or read and write	15	30.0
Elementary education	5	10.0
Secondary education	19	38.0
University education	11	22.0
Relative relationship to the elderly patient		
Wife	16	32.0
Daughter	17	34.0
Son	8	16.0
Step daughter	9	18.0

Novelty Journals

ISSN 2394-7330

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Table (X): represents the distribution of the studied family's caregivers according to their socio- demographic characteristics. This table revealed that the age of the studied family's caregivers ranged from 21 to 62 years with a mean of 39.54 ± 11.33 years. Slightly less than one - third of them (30%) their age ranged from 21to 30 years and from 41 to 50 years respectively while those in the age group from 31 to 40 years and those more than 50 years constituted 20%.

About (82%) of the studied family's caregivers were female and the majority of them (90%) were married. Concerning occupation more than two thirds of the studied family's caregivers weren't working (housewife) and (38%) of them had secondary education.

Regarding the relative relationship to the elderly patient, it was observed that about one - third of them (32% and 34% respectively) were wife and daughter, compared to (16% and 18% respectively) were son and step daughter.

Table (XI): Distribution of the studied family's caregivers throughout the study phases regarding to their total knowledge score

Variables	The studied family caregivers						X^2 P
	Pre- intervention (I) (n= 50)		Immediate post intervention (II) (n= 50)		Three months post intervention (III) (n= 50)		
	n	%	n	%	n	%	
Good	1	2.0	50	100.0	45	90.0	95.105 0.001*
Fair	1	2.0	0	0.0	5	10.0	
Poor	48	96.0	0	0.0	0	0.0	
Range Mean ± SD	0-43 3.16 ± 7.702		42-58 53.7 ± 4.687		30-58 49.38 ± 7.431		
F P	925.041 0.001*						

*Significant at (p < 0.05)

Table (XI): illustrates the distribution of the studied family's caregivers throughout the study phases regarding to their total knowledge score. This table illustrated that, there was significant improvement of the total score of knowledge of the studied family's caregivers pre, immediate and three months post program intervention (p<0.05), where the mean scores of their knowledge increased from 3.16 ± 7.702 pre-program intervention to 53.7 ± 4.687 immediately post program intervention and 49.38 ± 7.431three months post intervention (table XIX and figure III). This difference was statistically significant (F= 925.041, p = 0.001).

Table (XII): Distribution of the studied family's caregivers throughout the study phases regarding to their total practice score

Variables	The intervention group (n=50)						X^2 P
	Pre intervention (I) (n=50)		Immediate post intervention (II) (n=50)		3 months post intervention (III) (n=50)		
	n	%	n	%	n	%	
Satisfactory practice	1	2.0	50	100.0	50	100.0	98.00 0.001*
Un satisfactory practice	49	98.0	0	0.0	0	0.0	
Range Mean ± SD	10 – 70 39.66 ± 10.592		85 – 104 102.52 ± 4.381		82 – 104 100.5 ± 5.056		
F P	1021.992 0.001*						

*Significant at (p < 0.05)

Novelty Journals

ISSN 2394-7330

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Table (XII): represents the distribution of the studied family's caregivers throughout the study phases regarding to their total practice score. This table showed that the majority of the studied family caregivers (98%) had an unsatisfactory practice during pre-program intervention compared to (100%) had a satisfactory practice either during immediately or three months post program intervention.

There was a significant improvement of the total practice score of the studied family's caregivers during the three phases of the study (pre, immediate and three months post program intervention) at ($p<0.05$), while the mean scores of their practice were (39.66 ± 10.592) in pre-program intervention and increased to (102.52 ± 4.381) immediately post program intervention and (100.5 ± 5.056) three months post program intervention (table XXVIII and figure 4). This difference was statistically significant at (F= 1021.992, p= 0.001).

Table (XIII): Correlation between knowledge, instrumental activities of daily living and quality of life among the studied elderly patients during pre-program and three months post program intervention

Variables	Instrumental activities of daily living		Quality of life	
	Pre intervention	Three months post intervention	Pre intervention	Three months post intervention
	r p	r p	r p	r p
Knowledge	0.254 0.075	0.378 0.007*	- 0.101 0.484	0.292 0.040*
Instrumental activities of daily living	-	-	0.550 0.001*	0.309 0.029*

*** Correlation is significant at the (p < 0.05 level) (2-tailed).**

****Correlation is significant at the 0.01 level (2-tailed)**

Table (XIII): represents the correlation between knowledge, instrumental activities of daily living and quality of life among the studied elderly patients during pre-program and three months post program intervention. This table revealed that there was a significant positive correlation between knowledge of the elderly patients and instrumental activities of daily living and quality of life at (p = 0.007 and 0.04 respectively) three months post - program intervention. There was also a significant positive correlation between instrumental activities of daily living and quality of life in pre-program intervention and three months post - program intervention at (p= 0.001 and 0.029 respectively).

Table (XIV): Correlation between knowledge, instrumental activities of daily living, activities of daily living, quality of life and socio-demographic data among the studied elderly patients during pre-program intervention

Variables	knowledge	Instrumental activities of daily living	Activities of daily living	Quality of life
	r p	r p	r p	r P
Age	-0.172- 0.232	-0.353- 0.012**	- 0.277- 0.052	-0.147- 0.308
Occupation	0.323 0.022*	0.592 0.001**	-0.33- 0.820	0.180 0.211
Education	0.618 0.001**	0.383 0.006**	-.108- 0.456	0.040 0.0783
Place of residence	0.101 0.485	0.202 0.159	0.061 0.675	-.007- 0.961
Knowledge	-	0.254 0.075	-0.137- 0.343	-0.101- 0.484

Instrumental activities of daily living	0.254 0.075	-	0.368 0.009**	0.550 0.001**
Activities of daily living	-0.137- 0.343	0.368 0.009**	-	0.567 0.001**

***Correlation is significant at the 0.05 level (2-tailed)**

****Correlation is significant at the 0.01 level (2-tailed)**

Table (XIV): represents the Correlation between knowledge, instrumental activities of daily living, activities of daily living, quality of life and socio-demographic data among the studied elderly patients during pre-program intervention. This table revealed that there was a significant negative correlation between elderly age and instrumental activities of daily living (p = 0.012). But there was also a significant positive correlation between knowledge, occupation and education at (p=0.022 and 0.001 respectively).

Moreover, there was a significant positive correlation between instrumental activities of daily living, occupation, education, activities of daily living and quality of life at (p = 0.001, 0.006, 0.009 and 0.001 respectively). Also there was a significant positive correlation between activities of daily living and quality of life as (p= 0.001)

Table (XV): Correlation between knowledge, practice and socio- demographic characteristics among the studied family caregivers' preprogram and three months post program intervention

Variables	**Knowledge**		**Practice**	
	Pre - intervention	Three months post intervention	Pre - intervention	Three months post intervention
	r p	r P	r p	r P
caregivers age	-0.167- 0.247	0.043 0.768	-0.093- 0.520	-0.047- 0.745
caregivers occupation	0.044 0.763	0.046 0.751	-0.203- 0.158	0.034 0.813
level of education	0.403 0.004**	0.439 0.001**	0.376 0.007**	0.324 0.022*
Knowledge	-	-	0.229 0.110	0.741 0.001**

***Correlation is significant at the 0.05 level (2-tailed)**

****Correlation is significant at the 0.01 level (2-tailed)**

Table (XV): represents the correlation between knowledge, practice and socio- demographic characteristics among the studied family's caregivers during pre-program and three months post program intervention. It was observed that there was a significant positive correlation between family's caregivers knowledge and the level of education during pre and three months post- program intervention as (p= 0.004 and 0.001respectively). As regards to their practice, it was a positively correlated with the level of education in pre and three months post- program intervention as (p= 0.007 and 0.022 respectively). It was also a positively correlated with knowledge during three months post program intervention as (p= 0.001).

4. DISCUSSION

Stroke is a global health issue which not only affects people in the developing countries but also in the developed countries. It occurs at any age but it is most common among the elderly persons. It leads to serious consequences which include physical disabilities, cognitive impairment and emotional disturbance [25,26].

Regarding socio – demographic characteristics of the studied elderly patients, the results of the present study revealed that about two thirds of the studied elderly patients their age ranged from (60 < 70) with a mean of (67.14 ± 7.923 years), more than half of them were male and more than two thirds of them were illiterate or read and write **(table I)**. This result is in agreement with **Abd-Elaziz et al., (2015)** who conducted a study to examine the effect of cognitive rehabilitation on improving cognitive function and activities of daily living among elderly patients with stroke at Assiut University

Hospital and found that more than three-quarters of their studied elderly patients their age ranged from (60 < 70) with a mean of (64.22 ± 5.68 years) and more than half of them were male and illiterate [27]. While the study conducted by **Chang et al., (2015)** in Korea, they found that more than half of their studied elderly patients with stroke their age ranged from (61-74) with a mean of (74.47 ± 4.64 years) and also were male [28].

As regards to the place of residence, the present study revealed that slightly more than three-quarters of the studied elderly patients were living in rural areas **(table I)**. This is in contrast with **Shahla et al., (2017)** who mentioned that only one-fifth of the studied patients were living in rural areas [29].

In relation to family income, the present study illustrated that the majority of the studied elderly patients mentioned that their monthly family income just enough **(table I)**. This result is in contrast with **Shebi and Abd Elhameed (2014)** who conducted this study in Egypt, at Mansoura University Hospital and demonstrated that more than half of the studied elderly patients their monthly income wasn't enough [11].

Concerning the type of stroke, the results of the present study showed that about two-thirds of the studied elderly patients had ischemic stroke while about one-third of them had hemorrhagic stroke **(Table II)**. This is in agreement with several studies which include: a study done at Liaquat University Hospital in Pakistan by **Qamar (2012)** [30], another study done at Beaumont Hospital in Ireland by **O'Regan (2016)** [31] and a study done in London, Ontario, Canada by **Thompson (2017)** [32] , which reported that about and more than two- thirds of the studied sample had ischemic stroke and about one-third had hemorrhagic stroke (62.5%, 37.5%), (64.4%, 35.6%) and (77.5% , 22.5%) respectively.

In relation to total knowledge score of the studied elderly patient, the findings of the present study also showed that there was no one of the studied elderly patients had a good knowledge score about stroke in pre-program intervention but immediately after implementation of the program the majority of them had a good knowledge score about stroke and only (10%) of them had a fair knowledge. This may be related to the effectiveness of the health education program in raising the awareness of elderly patients and their family caregivers about stroke. This result is in the same line with **Abdelmordy (2016)** who conducted a study in Benha city, Egypt and found that only (4%) of the stroke patients had good knowledge in pre intervention, but it increased to (90%) post intervention and only (10%) of them had the average knowledge post intervention [33].

The results of the present study also, illustrated that there was a statistically significant improvement of the mental status of studied elderly patients during pre, immediate and three months post program intervention, where the mean score of their mental status error decreased from 2.20 ± 0.857 in pre-program intervention to 1.50 ± 0.580 immediately post program intervention and 1.12 ± 0.385 in three months post program intervention with a statistically significant difference (**table III)**. This is in the line with **Shi and Zhang (2017)** who reported that there was a significant improvement of the mental status of the study group from the baseline to three months after implementation of the program with a statistically significant difference [34].

The findings of the present study also showed that there was a statistically significant improvement of the level of depression of the studied elderly patients during pre and three months post program intervention, where the mean score of their level of depression decreased from 1.52 ± 0.505 in pre-program intervention to 1.04 ± 0.198 in three months post program intervention with a statistically significant difference **(table VI)**. This result is similar to **Shebi et al., (2014)** who reported that there was a significant improvement in post stroke depression of geriatric patients from pre intervention to three months post program implementation, where the mean score of their level of depression decreased from 20.22 ± 7.03 in pre-program intervention to 13.62 ± 13.02 three months post program intervention with a statistically significant difference [11]. Furthermore, a study conducted by **Jeong et al., (2014)** also showed a significant improvement in the level of depression among the studied stroke patients from pre intervention to two months post intervention [35].

The findings of the present study also illustrated that there was a significant improvement in the level of independency of the studied elderly patients regarding instrumental activities of daily living pre and three months post program intervention. The mean score of their independency in instrumental activities of daily living increased from 1.50 ± 1.403 in pre-program intervention to 2.26 ± 1.226 three months post program intervention. This difference was a statistically significant **(table VII)**. This result is in agreement with **Lai et al., (2017)** who conducted a study in Taiwan and reported that there was a significant improvement of the instrumental activities of daily living of the studied patients, where the mean score of their instrumental activities of daily living increased from 1.50 ± 1.42 at admission to 3.0 ± 2.34 during discharge [36].

In relation to degree of independency on the performance of activities of daily living, The results of the present study also demonstrated that, there was a statistically significant improvement in the level of independency in the activities of daily living among the studied elderly patients pre and three months post program intervention, where the mean total score of their independency in the activities of daily living increased from (0.58 ± 0.810) in pre-program intervention to (1.30 ± 0.789) in three months post program intervention with a statistically significant difference **(table VIII)**.This result is in the same line with **Iokawa et al., (2017)** who conducted a study in Japan and reported that the Barthel Index of activities of daily living of the studied stroke patients was significantly increased at one month after discharge compared with that at discharge, where the mean score of activities of daily living increased from (69.3 ± 30.1) at discharge to (76.3 ± 30.3) one month after discharge [37].

Furthermore the results of the present study also illustrated that there was a significant improvement of the total quality of life score of the studied elderly patients pre and three months post program intervention, where the mean scores of their quality of life increased from (77.06 ± 11.566) in pre-program intervention to (101.1 ± 11.908) in three months post intervention **(table IX)**.This is in the same line with **Ali (2013)** who conducted a study in Egypt and reported that there was a significant improvement of the total quality of life score of the studied stroke patients pre and three months post intervention, where the mean scores of their quality of life increased from (23.60 ± 4.18) in pre-program to (75.22 ± 14.16) in three months post-program [38].

In relation to total knowledge score of the studied family caregivers, the present study illustrated that there was a significant improvement of the total knowledge score of the studied family caregivers during pre, immediate and three months post program intervention. As the majority of the studied family caregivers had a poor knowledge score about stroke in pre-program intervention, while immediately and three months post-program intervention all and the majority of them had good knowledge score and only (10%) of them had a fair knowledge score about stroke **(table XI)**. This improving of their knowledge about stroke may be due to the effectiveness of the health education program that conducted with the family caregivers, the effectiveness of the information booklet which was given to them and the readiness of the caregivers to learn. This result is supported by **Adhav (2016)** who reported that during pre-program about two-thirds of caregivers had the average knowledge score, about one-third of them had a poor knowledge score and (4%) of them had a good knowledge score, whereas in post-program the majority of them had a good knowledge score, (8%) of them had the average knowledge score and none of the caregivers had a poor knowledge in post-program [39].

Concerning the total practice score of the studied family caregivers, the majority of the studied family caregivers had an unsatisfactory practice in pre-program intervention compared to all of them had a satisfactory practice either immediately or three months post program intervention **(table XII)**. This result is similar to a study done by **Abdelmordy (2016)** who reported that only (14%) of stroke patient caregivers had a good practice in pre intervention, but in post intervention this percentage increased to (63%) [33].

The results of the present study revealed that, there was a significant positive correlation between quality of life of the studied elderly patients and their instrumental activities of daily living either during pre-program or three months post program intervention **(table XIII)**. This may be due to that when the elderly person become independent and capable to perform their instrumental activities of daily living, as a result of that their quality of life improved. This result is in contrast with **Oros et al., (2016)** who showed that there was a significant negative correlation between quality of life and instrumental activities of daily living [40].

Regarding correlation between knowledge and socio- demographic characteristics of the studied elderly patients, the present study revealed that there was a significant positive correlation between elderly knowledge, their occupation and education **(table XIV)**. In the contrary, the studies conducted by **Saengsuwan et al., (2017)** and **Abdelmordy (2016)** reported that there was no statistically significant correlation between socio-demographic characteristics of the stroke patients and their total knowledge score [41, 33].

Concerning correlation between knowledge, practice and socio demographic characteristics of the studied family caregivers, the present study illustrated that there was a significant positive correlation between family caregivers' knowledge and the level of education during pre and three months post-program intervention. Also, their practice was positively correlated with their level of education in pre and three months post-program intervention. In addition to that, their practice was positively correlated with their knowledge during three months post program intervention **(table XV)**.

This result is in contrast with **Abdelmordy (2016)**, in the part of the correlation of knowledge with socio-demographic who found that there was no significant correlation between socio-demographic characteristics of the studied caregivers and their total knowledge score either in pre or post intervention. On the other hand, the present study results is in the same line with **Abdelmordy (2016)** in the correlation between caregivers' level of education and their total practice score. Additionally, they mentioned that there was a significant positive correlation between caregivers ' total practice score and their total knowledge score during pre and post program implementation [(33)].

5. CONCLUSION

Based on the findings of the present study, it can be concluded that the educational program was effective and level of knowledge and practices of the stroke patients and their family caregivers were improved after implementation of the program. Moreover, a significant improvement in the mental status, activities of daily living, instrumental activities of daily living, level of depression and quality of life for stroke patients were observed in three months post program intervention than the pre-program.

6. RECOMMENDATIONS

Based on the results of the present study the following recommendations were suggested:-

1- Health education units should be established in outpatient clinics every hospital to provide continuous health education to the elderly patients and their family caregivers regarding all information about stroke.

2- Written guidelines about stroke in the form of booklets or brochures should be provided to each elderly patient affected by stroke and their family caregivers in order to encourage them in effective adherence to the treatment plan.

3- In-service training program should be provided continuously to health care workers about stroke especially about warning signs, immediate action to manage stroke, rehabilitation needs and preventive measures to prevent further recurrence.

4- Public health sectors should establish awareness companies directed to general population and high risk groups either in rural or urban areas regarding to warning signs, early action to manage stroke and its preventive measures.

5- Regular screening for early signs of stroke among the high risk groups, especially elderly patients with chronic diseases for early detection of stroke as well as prevent its serious consequences.

6- Mass media programs are needed to help disseminating information about stroke to a large sector of the community as it is one of the most serious diseases.

REFERENCES

[1] Gamito P, Oliveira J, Coelho C, Morais D, Lopes P, Pacheco J, Brito R, Soares F, Santos N and Barata A. Cognitive Training on Stroke Patients via Virtual Reality-Based Serious Games. Diaability and Rehabilitation Journal. 2017; 39(4): 385-388.

[2] Mohar J, Wolf P, Grotta J, Moskowitz M, Mayberg M and Kummer R. Stroke Pathophysiology, Diagnosis and Management. 5th ed. United State of America: Elsevier Saunders Co., 2011; 198.

[3] Comerford K, Hager L, Krik K, Oshea J and Ruhf L. Pathophysiology Incredibly Visual. 2nd ed. China: Wollters Kluwer/ Lippincott Williams &Wilkins Co., 2012; 92-94.

[4] Costa T, Costa K, Fernandes M, Martins K and Brito S. Quality of Life of Caregivers for Patients of Cerebrovascular Accidents: Association of (Socio-Demographic) Characteristics and Burden. School of Nursing Journal. 2015; 49(2):243-250.

[5] World Heart Federation. Stroke. 2016. Available at: http://www.world-heart-federation.org/cardiovascular-health/stroke/

[6] Annual Bulletin of Mortality Statistics. Central Agency for Public Mobilization and Statistics (CAPMAS). 2013. Available at: http:// www.capmas.gov.eg

[7] Abd- Alla F and Moustafa R. Burden of Stroke in Egypt: Current Status and Opportunities. International Journal of Stroke. 2014; 9(8): 1105-8.

[8] Amritha C. Knowledge Assessment of Caregivers of Stroke Patients about their Caring Role. Published Diploma Thesis. School of Nursing, University of Sree Chitra Tirunal Institute, Trivandrum, 2009.

[9] Centers for Diseases Control and Prevention (CDC). Stroke Fact Sheet. 2016. Available at: http://www.cdc.gov/dhdsp/data_statistics/fact_sheets/fs_stroke.htm

[10] Rowland L and Pedley T. Merritt's Neurology. 12th ed. Philadelphia: Wolters Kluwer/ Lippincott Williams & Wilkins Co., 2010; 291.

[11] Shebl A and Abd Elhameed S. Impact of Informal Caregivers Training Program on Geriatric Patients' Functional Status and Post-Stroke Depression. IOSR Journal of Nursing and Health Science. 2014; 3(4): 45-53.

[12] Hesamzadeh A, Dalvandi A, Maddah S, Khoshknab M and Ahmadi F. Family Adaptation to Stroke: A Metasynthesis of Qualitative Research based on Double ABCX Model. Asian Nursing Research Journal. 2015; 9(3): 177-184.

[13] Rodrigues R, Marques S, Kusumota L, Santos E, Fhon J and Fabrício-Wehbe S. Transition of Care for the Elderly after Cerebrovascular Accidents – from Hospital to the Home. Revista Latino-Americanc de Enfermagem Journal. 2013; 21(Spec):216-24.

[14] Adika O, Ezonbodor E and Nwachukwu P. Opinion and Perception of Family Caregiving Following Stroke. Journal of Research in Nursing and Midwifery. 2012; 1(2): 22-28.

[15] Naylor M and A multi-disciplinary team of college. New Courtland Center for Transitions and Health, University of Pennsylvania, School of Nursing. Transitional Care Model (TCM). 1990. Revised in 2013, 2014. Available at: www.transitionalcare.info

[16] Stroke Foundation. Clinical Guidelines for Stroke Management 2017. 2018. Available at: https://informme.org.au/Guidelines/Clinical-Guidelines-for-Stroke-Management-2017

[17] Timby B and Smith N. Introductory Medical – Surgical Nursing. 9th ed. Philadelphia: Lippincott Williams & Wilkins Co., 2007; 739- 740.

[18] Morton P and Fontaine D. Critical Care Nursing.10th ed. Philadelphia: Wolters Kluwer/ Lippincott Williams & Wilkins Co., 2013; 787-789.

[19] Pfeiffer E. A short Portable Mental Status Questionnaire for the Assessment of Organic Brain Deficit in Elderly Patients. Journal of the American Geriatric Society. 1975; 23(10):433-41.

[20] Kurlowicz L and Wallace M. The Mini Mental State Examination (MMSE). Journal of Psychiatric Research, 1999; 12(3): 189-198.

[21] Yesavage J, Brink T, Rose T, Lum O, Huang V, Adey M and Leirer V. Development and Validation of A Geriatric Depression Screening Scale: A Preliminary Report. Journal of Psychiatric Research. 1983; 17:37-49.

[22] Lawton M and Brody E. Assessment of Older People: Self-Maintaining and Instrumental Activities of Daily Living. Gerontologist. The Gerontological Society of America Journal. 1969; 9:179-186.

[23] Katz S, Down T, Cash H, and Grotz R. Progress in the Development of the Index of ADL. The Gerontologist Journal. 1970; 10(1): 20-30.

[24] University of Washington. World Health Organization Quality of Life BREF (WHOQOL - BREF). 1997, Updated 1/10/2014. Available at: http://www.do-cu-cu.com/view/clab586492b0a4d9a8d79825339/Whoqol-BREF-University of Washington.pdf

[25] Zulkifly M, Ghazali S, Din N and Subramaniam P. The Influence of Demographic, Clinical, Psychological and Functional Determinants on Post-stroke Cognitive Impairment at Day Care Stroke Center, Malaysia. Malaysian Journal of Medical Sciences. 2016; 23(2): 53-64.

[26] Tseng C, Huang G, Yu P and Lou M. A Qualitative Study of Family Caregiver Experiences of Managing Incontinence in Stroke Survivors. PLoS ONE Journal. 10(6): 1-12.

[27] Abd-Elaziz S, Khedr E, Ahmed H and Ibrahim H. Effect of Cognitive Rehabilitation on Improving Cognitive Function and Activities of Daily Living among Elderly Patients With Stroke at Assiut University Hospital. Education and Practice Journal. 2015; 6(2): 44-55.

[28] Chang A, Park Y, Fritschi C and Kim M. A Family Involvement and Patient-Tailored Health Management Program in Elderly Korean Stroke Patients' Day Care Centers. Rehabilitation Nursing Journal. 2015; 40(3): 179-87.

[29] Shahla N, Ardashir A and Yaghoub P. The Effect of Proprioceptive Neuromuscular Facilitation (PNF) on Activities of Daily Living of Client with Cerebrovascular Accident. World Family Medicine/Middle East Journal. 2017; 15(7): 154-158.

[30] Qamar Z. Depression among Stroke Patients and Relation with Demographic and Stroke Characteristics. Master Thesis. School of Public Health, Umea University, Pakistan, 2012.

[31] O'Regan L. Self-Awareness and its Association with Functional Performance in Sub-Acute Stroke: a Cross-Sectional Study. Master Thesis. School of Medicine and Health Sciences, Royal College of Surgeons University, Ireland, 2016.

[32] Thompson S. Assessing the Impact of Caregiver Outcomes on Function and Reintegration of Stroke Survivors Participating in a Community Stroke Rehabilitation Program. Master Thesis. School of Health and Rehabilitation Sciences, University of Western Ontario, Canada, 2017.

[33] Abdelmordy M. Evaluation of Home Health Care Intervention for Cerebral Stroke Patients and Their Caregivers in Benha City. Doctor thesis. School of Nursing, Benha University, Egypt, 2016.

[34] Shi Y and Zhang Z. Effect of Comprehensive Rehabilitation Training on Prevention of Post-Stroke Dementia: A Randomized Controlled Trial. International Journal of Clinical and Experimental Medicine. 2017; 10(5): 7760-7766.

[35] Jeong Y, Kim W, Kim Y, Choi K, Son S and Jeong Y. The Relationship between Rehabilitation and Changes in Depression in Stroke Patients. Physical Therapy Science Journal. 2014; 26(8): 1263–1266.

[36] 204. Lai C, Tsai M, Luo J, Liao W, Hsu P and Chen H. Post-Acute Care for Stroke - A Retrospective Cohort Study in Taiwan. Patient Prefer Adherence Journal. 2017; 11: 1309-1315.

[37] Iokawa K, Hasegawa K and Ishikawa T. Possible Effectiveness of Collaboration between Occupational Therapists and Care Managers using the Management Tool for Daily Life Performance for Stroke Patients in Transitional Care. Asian Journal of Occupational Therapy. 2017; 13(1): 79-86.

[38] 212. Ali Z. Effect of Nursing Care Strategy on the Functional and Physical Abilities of Patients Following Stroke. Journal of Neurology and Neurophysiology. 2013; 58: 1-6.

[39] Adhav P. Enhancing Home Care Abilities of Care Givers of Stroke Patients. Sinhgad e-Journal of Nursing. 2016; 4(2): 54-56.

[40] Oros R, Popescu C, Iova C, Mihancea P and Iova S. Depression, Activities of Daily Living and Quality of Life in Elderly Stroke Patients. International Journal of the Bioflux Society, 2016; 8(1): 25-28.

[41] Saengsuwan J, Suangpho P and Tiamkao S. Knowledge of Stroke Risk Factors and Warning Signs in Patients with Recurrent Stroke or Recurrent Transient Ischaemic Attack in Thailand. Neurology Research International Journal. 2017; 2017: 1-7.