Effect of Caregivers Training Program on Stroke Patients' Self-Efficacy

Hanaa Moukhtar Ibrahim[1], Shimaa Elwardany Aly[2], Azza Mohamed Abd El-Aziz[3], Naglaa Saad Abd El-aty[4], Samia Youssef Sayed [5], Hanan Abd-Elrazik Abdelall[6] Hawidaa Khalaf Abd_El-Aal [7]

[1] Lecturer of Gerontological Nursing, Faculty of Nursing, Assuit University, Egypt.
[2,4] Assistant professor of Community Health Nursing, Faculty of Nursing, Assuit University, Egypt.
[3] Lecturer of Psychiatric and Mental Health Nursing, Faculty of Nursing, Assiut University, Egypt.
[5,6] Assistant professor of Medical-Surgical Nursing, Faculty of Nursing, Assiut University, Egypt.
[7] Fellow Medical - Surgical Nursing, Assiut University Hospitals, Egypt.

Abstract

Background: Stroke is a major cause of disability in adults and elderly. Chronic complications arising from this disease have impact on the affected patients' reduced self-efficacy. **Aim**: Evaluate the effectiveness of caregiver training program on stroke patient's self-efficacy. Quasi-experimental design was utilized. **Setting**: The study conducted in the departments and outpatient clinics of neuropsychiatric diseases and neurosurgery hospital at Assiut University Hospitals. **Sample**: Caregivers and their patients admitted to neuropsychiatric diseases and neurosurgery hospital, during 6 months (equal number of 125 for both). **Tools:** Include four tools. **Tool 1** structured interview questionnaires. **Tool II**: Caregivers' knowledge about stroke. **Tool III:** Caregivers' practices regarding stroke patients' care. **Tool IV:** Stroke Self-Efficacy Questionnaire (SSEQ). **Results:** 95.2% of caregiver's have unsatisfactory knowledge about stroke in pre-program, compared to 84.8% and 76.0% have satisfactory knowledge at post program and follow up; respectively. Also, caregiver practices levels of patient's care were 100% inadequate in pre-program. These levels improved to adequate practice in post program and follow up (72.0% & 75.2%); respectively. A statistically significant difference of stroke patient's self-efficacy through training program p =0.000. **Conclusion:** A caregivers training had a positive effect on stroke patient's self-efficacy. **Recommendations:** Continues caregivers training regarding care of stroke patients.

Key Words: Caregivers, Self-efficacy, Stroke Patients, Training Program.

Introduction:

Stroke is a common term used for brain damage caused by a disturbance of the flow of blood to the brain. In general, it affects men and women nearly equally. In females, the lifetime risk of stroke is higher and can occur at all ages. However, the incidence of stroke rises with age as the population ages, combined with the decrease in case fatality after stroke,

between 2012 and 2030, the prevalence of stroke is projected to rise by 3.4 million people. The absolute number of new cases is rising, as is the prevalence. Stroke-related morbidity remains high, with costs estimated at $34 billion per year for healthcare services, medications, and missed days of work **(Ovbiagele et al., 2013, Krishnamurthi et al., 2015; and Feigin et al., 2017).**

Health conditions such as hypertension, cardiovascular diseases, and diabetes are established risk factors of stroke, whereas lifestyle factors such as smoking, alcohol consumption, and obesity are found to contribute to stroke risk **(O'Donnell et al., 2010 and Teh et al., 2018).**

Stroke leads to a range of health issues that affect the physical and psychological state of a patient, depending on which part of the brain is affected, including paralysis or weakness, difficulty communicating, problems with swallowing, and pain or numbness. Thinking, perception, attention, learning, judgment, and memory were also altered. People with strokes may feel overwhelmed or find it difficult to regulate their emotions **(Donnan, et al., 2016).**

Mechanisms to enhance stroke recovery include psychological adaptations such as self-efficacy, which is defined as the confidence a person has in his or her ability to perform relevant self-care activities. Self-efficacy is a compensatory mechanism that may lead to improved psychological adaptation post-stroke **(Mazurek & Gieracha, 2020).** Four principles could enhance self-efficacy, which include direct mastery of experience, substitution of experience, verbal persuasion, and understanding of physiological states and signals **(Hopper, 2019)**.

Self-efficacy has major effects on the amount of effort that patient contribute to a given task. Patient with high levels of self-efficacy for a particular task would be resilient and persistent, whereas the patient with low levels of self-efficacy for that task can disengage or avoid the situation. There are several key sources of knowledge that inform self-efficacy: personal experience, observation, persuasion, and emotion **(Hopper, 2019).**

Caregivers need basic knowledge and skills to care for stroke patients because of various disabilities and potential complications of the stroke. These include performing or aiding the patients in basic daily living activities such as feeding, mobilizing, toileting, bathing, and dressing. They also require higher level skills as supervision and administration of medications, arranging transportation. Caregivers have the responsibilities of providing direct care, emotional support, financial support, and advocacy for the patient **(Jiang, et al., 2014**).

Nurses have an important role in the care of stroke patients and they need to provide self-efficacy enhancing interventions during daily care. Also, nurses need to emphasize further the role of self-efficacy in the care for patients with stroke in the nursing practice **(Korpershoek, et al., 2011 and Long, et al., 2020).**

Also, health education of stroke patients and their caregivers can reduce the stroke complications. Hypertension and diabetes mellitus management, drug administration, and the cessation of cigarette smoking. As well as recognition of stroke symptoms, access to emergency treatments eventually led to a good prognosis of stroke **(Hinkle, et al., 2018)**.

Significance of study:

Worldwide, strokes are the second leading cause of death and the third leading cause of disability. It induces in distinct ways dependence on others. Patients may become dependent on others after a stroke to work in everyday life, and some may even require long-term

care. The care of patients is usually carried out by their families. Many studies have shown that patients with strokes may have disabilities and require the support of family members **(Park & Ovbiagele, 2016).**

Recently, a high prevalence of stroke in Assiut governorate and it was far more prevalent in men and among illiterates, who constitute a substantial proportion of the population **(Khedr, et al., 2013)**.

Also, **El Tallawy, et al., 2010** reported that the incidence of stroke in the desert governorate of the New Valley is 2·5/1000 with a prevalence of 5·6/1000. However, may not be representative of the rest of Egypt, and thus the rising incidence of stroke cannot be confirmed.

Self-efficacy can be influenced through self-management programs and is predictive of greater levels of functioning and psychological well-being. Stroke is regarded as a complex chronic disability, and however, there has been minimal reported research on the utility of stroke self-efficacy program. So, this study was conducted to determine the effect of caregivers' training program on self-efficacy of stroke patients.

Patients and Method:

Study aim:

This study was conducted to evaluate the effectiveness of caregiver training program on the stroke patients' self-efficacy.

Study Hypotheses:

Hypotheses: Caregivers training program have a positive effect on the stroke patient's self-efficacy.

Null Hypotheses: Caregivers training program haven't effect on stroke patient's self-efficacy.

Operational definition:

- **Caregivers:**

A caregiver is a paid or unpaid member of a person's social network who helps them with activities of daily living. They may provide the care in the home, a hospital, or an institution. Although caregivers include trained medical, nursing, and other health personnel, the concept also refers to parents, spouses, or other family members, friends, members of the clergy, teachers, social workers, fellow patients (**Kent, et al., 2016**)

- **Self-efficacy:**

Self-efficacy refers to an individuals' confidence in their ability to complete a task or achieve a goal **(Hopper, 2019).**

Research design:

A quasi-experimental study design was utilized.

Technical design:

Setting:

The study was carried out in the departments and outpatient clinics of neuropsychiatric diseases and neurosurgery hospital at Assiut University Hospitals.

Sampling:

The study sample included all patients and their family caregivers admitted to neurological departments and outpatient clinics of neuropsychiatric diseases and neurosurgery hospital at Assiut University Hospital's. It was approached over a six-month period, from the

beginning of August 2018 to the end of January 2019. A total of 125 patients and their caregivers were included in the study.

A) Patients: The study included 125 stroke patients aged 50 years and up who met the following criteria: they were diagnosed with a stroke, able to communicate and follow instructions, they agreed to participate in the study, and their medical condition was stable and scheduled to be discharged to home.

B) Caregivers: A total of 125 family caregivers were included in the study. To begin, patients were asked to brand one or two preferred caregivers who would be responsible for providing care to them, and then the caregivers' inclusion criteria were checked, included: not having any physical disabilities, agreeing to participate in the study, and being physically capable of implementing the program.

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

Tool I: Structured interview questionnaire for patients and their caregivers. This tool was developed by the researchers and consisted of three parts:

Part (1): Demographic data of stroke patients. It included six items; age, sex, marital status, occupation, level of education, and residence. This data used to explore if there is a relation between stroke patient's demographic data and their self-efficacy.

Part (2): Clinical data of stroke patients: it used to assess clinical data of stroke patients and their relation with self-efficacy. This data included the type of stroke, duration and onset of disease, present complaints, type of food intake, periodicity of follow-up, family history of stroke, patient medical history and risk factors of stroke.

Part (3): Caregivers of stroke patients demographic data, including: age, gender, marital status, occupation, level of education, residency, relationship of caregivers with stroke patients, and place of living caregivers. It is used to measure the effect of caregiver demographic data on stroke patient care.

Tool II: Caregivers' knowledge about stroke disease. This tool was established by the researchers based on current national and international relevant literature reviews of stroke to assess caregiver knowledge level **(Forster, et al., 2013, Krishnamurthi, et al., 2015 and Long, et al., 2020).** It was included 8 multiple choice questions (37 questions) related to knowledge of family caregivers about stroke disease such as the meaning of stroke, types of stroke, causes, risk factors of stroke, signs, and symptoms of stroke, stroke complications, nutritional requirements, and the amount of fluids recommended for the patient.

Scoring system of knowledge:

The answers were scored based on the level of knowledge of the studied sample. Each question had 3 possible responses: correct response was scored (2) incomplete answers (1), and incorrect answer and don't know (0). Each item summed-up then converted into a percent score. Unsatisfactory if score of knowledge was < 60% and satisfactory if it was ≥ 60%.

Tool III: Caregivers' practices regarding care for stroke patients: This tool was developed by the researchers based on national and international relevant literature reviews **(Xu, et al.,**

2018, and Long, et. al., 2020) to assess the practice level of caregivers regarding care for stroke patients. It included 33 items related to feeding, toileting, dressing; bathing, and skincare, transferring from the chair; care provided in accidental events as falling; managing bowel and bladder problems as (incontinence, urinary retention, constipation).

Scoring system of Tool III:

it was made as follow, each statement had 2 possible answers: done was scored (1) and not done was scored (0). Each item summed-up then converted into a percentage score. Inadequate practice, if the score was < 60% and adequate practice, if it was ≥ 60%.

Validity and reliability:

Study tools II, III were tested for content validity by a jury of 5 experts from related specialties. The necessary modifications were done accordingly. The reliability was assured by Spearman's correlation coefficient r = 0.952 for tool II and r = 0.861 for tool III.

Tool IV: The Stroke Self- Efficacy Questionnaire (SSEQ) adopted from Jones, et al., 2008:

It is a self-report scale of self-efficacy post stroke that measure two separate dimensions of self-efficacy relevant to recovery and independence after stroke (activity and self-management). The SSEQ is consisting of a 13-items self-report scale measuring self-efficacy judgments in specific domains of functioning post stroke. Individuals rate their belief in their ability to achieve each items of the self-efficacy scale. On a 10-point scale, where 0 = not at all confident to 10 = very confident. This scale was analyzed based on descriptive statistics; percentage, mean, and standard deviation.

Reliability of SSEQ:

The Person Separation Index (PSI) indicates the extent to which the questionnaire distinguishes distinct ability levels. This is equivalent to Cronbach's alpha, with values ≥ 0.80 regarded as adequate. Stroke Self-Efficacy Questionnaire is a valid and reliable tool, recommended for use in clinical care of stroke patients **(Topcu, & Oguz, 2018)**.

The validity of SSEQ:

The questionnaire demonstrates good internal consistency and criterion validity. The final 13-item Stroke Self-Efficacy Questionnaire was found to have good content validity and feasibility to use in the recovery period following stroke. Cronbach Alpha was 0.90 suggesting good internal consistency, and criterion validity were high compared with the Falls Efficacy Scale, r = 0.803, p < 0.001.

Method:

1- Administrative design:

The permission for conducting the study was obtained from the faculty of nursing and an official letter was issued to the head manager of Neuropsychiatric diseases and neurosurgery hospital at Assiut University Hospitals for seeking permission to carry out the study after explaining the purpose at the study.

2- A pilot study:

It was carried out on 10 patients with stroke and their family caregivers in the departments and outpatient clinics of Neuropsychiatric diseases and neurosurgery hospital at Assiut University Hospitals. The pilot study was

done before starting data collection, to test the feasibility of the tools and make the necessary modifications. There was no difficulty with the tools. So, those 10 patients were included in the study.

3- Ethical considerations:

Research proposal was approved from ethical committee in the faculty of nursing. There was no risk for study subject during application of the research. The study was following common ethical- principles in clinical research. Informed consent was obtained from the patients that who is willing to participate in the study after explaining the nature and purpose of the study. Confidentiality and anonymity were assured. Patient had the right to refuse to participate and or withdraw from the study without any rational any time. Patient privacy was considered during collection of data.

Phases of Caregivers training program: it was carried out into three phases.

a) Assessment and planning phase:

In the first meeting with the patients and their caregivers, the researchers introduced themselves to the participants, clarified the nature and the purpose of this study. Participations' approval was obtained. Each patient and his\her caregiver was interviewed individually by the researchers to collect demographic and clinical data of patient using part 1, 2 of **tool I**, as well as demographic data of caregiver using part 3 of **tool I**. On the other hand, assessment was conceded to every caregiver by using **tool II** to assess their knowledge about stroke and **tool III** to assess caregiver's practices regarding stroke patient's care.

Then, the researchers used tool **IV** to measure patients' self-efficacy level using Stroke Self-Efficacy Questionnaire

(SSEQ). It is the most commonly measure for self-efficacy in patients with stroke. It covers all functional tasks and self-management care related stroke patients.

Sessions of data collection with patients and caregivers was carried out at the departments of neuropsychiatric diseases and neurosurgery hospital and completed during follow up after discharge of stroke patients at outpatient clinics. The duration of data collection and implementation of the training program lasted 12 months (one year).

An Arabic educational training booklet has been developed by the researcher based on determined needs, baseline assessment and relevant literatures. It was written in a simple Arabic language and supplied with photos and illustration to help the caregivers to understand the content.

b) Implementation phase:

The training program was implemented for the stroke patients and for all assigned caregivers. The researchers schedule the sessions of the training program. The caregivers with their patients were divided into small groups according to suitable time and readiness to present session. And, their needs based on the assessment of their knowledge and practices regarding stroke patient care. Each group was consisted of 5-6 family caregivers. The training program includes **3 sessions** in 5 days per week. Each session took 40-55 minutes. Topic explanations depending on the level of education of the caregivers.

The first session: At the beginning of this session, the researchers made revision to the aims of the training sessions and contents of teaching topic about stroke. The family caregivers were

received the basic knowledge that included information about definition of stroke, causes and risk factors of recurrent stroke, signs and symptoms, complications of a stroke, measures needed to prevent subsequent stroke.

The second session: caregivers were received health education about basic needs of patients with stroke including, nutrition, administration of medications, important of safety environment. Also, teaching the importance concept of self-efficacy to help their patients to be independent in their abilities and activities.

Third session: At this time, the researcher made a demonstration about skills of moving the patient, safety measures to prevent falls, therapeutic exercise, and common assistive devices used for patients with stroke. Also, the researchers made a demonstration about skills of stroke patient care as: personal hygiene (bathing, skin care, and changing patient's clothes), preventive measures of pressure ulcer, and constipation management.

At the end of each session, a summary was given by the researchers and emphasizing the most important points. Before the starting of next session, caregivers were asked questions related to the topics discussed in the previous session to identify their learning achievement. These sessions were repeated for every new group of caregivers. This period lasts 3 months**.**

Methods of teaching used in the training sessions: lectures, discussions**,** role play**,** and demonstration.

Media used in teaching: Pictures, videos, and colored booklet.

c) Evaluation phase:

It was conducted at outpatients' clinics of neuropsychiatric diseases and neurosurgery hospital for both family caregivers and their stroke patients after arrangement with the caregivers through phone for follow up, this phase was performed two times, first evaluation was after 3 months (post program) and the second evaluation follow-up was after six months from program implementation. Caregivers were evaluated by using the study tool II and tool III to measure the knowledge and practices of caregivers regarding care of stroke patients after implementation of the program. Also, the patients were evaluated by using the study tool IV (SSEQ) to determine the effect of caregiver's training program on self-efficacy of stroke patients.

The implementation of the program took one year from the start of data collection to its session's termination with the last participant.

Statistical analysis:

Data entry and data analysis were done using SPSS version 22 (Statistical Package for Social Science). Data were presented as a number, percentage, mean, standard deviation, median, and IQR. Chi-square and Fisher Exact tests were used to compare qualitative variables. Independent samples t-test was used to compare quantitative variables between two groups and ANOVA test for more than two groups, Paired samples t-test was done to compare quantitative variables between pre-test and post-test in case of parametric data.

Mann-Whitney test was used to compare quantitative variables between two groups and Kruskal Wallis Test for more than two groups, Wilcoxon Signed Rank Test was done to compare quantitative variables between pre-test and post-test in case of non-parametric

data. Pearson correlation was done to measure the correlation between quantitative variables for parametric and Spearman for non-parametric data. P-value considered statistically significant when P < 0.05.

Results:

Table (1): illustrate those demographic data of stoke patients and their caregivers; it was cleared that 56.0% of stoke patients were male and 43.2% of them aged 65 to less than 80 years, while 61.6% of their caregivers aged 20-40 years. Concerning marital status; 80.0% and 64.8% from patients and their caregivers were married respectively, also the table revealed that 38.4% from patients were read and write followed by 30.4% were illiterate while 36.0% from their caregivers had preparatory educational level and only 12% were illiterate. Moreover; 40.0% and 23.2% of patients were housewife and employee while 42.4% and 36.8% from their caregivers were employees and freelancers respectively. As regarding residence 66.4% and 64.8% of patients and their caregivers were from rural areas.

Figure (1): reveals the degree of caregiver's relevancy to stroke patients; it revealed that 40.8% of caregivers' relatives were patients' sons followed by daughters 30.4%.

Figure (2): shows the place of caregivers' living; it was illustrated that 63.2% of patients' caregivers were lived with their stroke patients.

Table (2): clears clinical data of stroke patients; it cleared that approximately two third (66.4%) of patients were suffering from ischemic stroke, and 58.4% of them had a stroke for less than one year. The onset of stroke was acute in 70.4% of stroke patients. Also, the table explained that 69.6% of patients complain of dry

cough followed by 44.0% of hemiparesis. As regarding type of food intake, 50.4% of patients receive semi-liquids food and 57.6% follow-up when needed. Also this table revealed that (61.6%) of patients hadn't family history of stroke diseases and (91.7% and 85.5%) from them have diabetes and hypertension respectively as patient risk factors for stroke.

Table (3): reveals the total score of caregiver's knowledge about stroke disease; The table showed that there were statistically significant differences between the knowledge of caregivers about stroke disease pre, post, and follow-up of the training program (0.000*).

Table (4): shows the total score of caregivers practice about special care for stroke patients; It was found that there were statistically significant differences between reported practice level pre, post, and follow up of the training program (0.000*)

Table (5): Reveals distribution of stroke self-efficacy among studied patients in pre, post and follow from the program application : it was found that in pre program the stroke self-efficacy among studied patients related to the statements of walk a few steps inside your house without help, use both your hands for eating food, persevere to make progress from your stroke after discharge from therapy, do your own exercise program every day, and cope with the frustration of not being able to do some things because of your stroke were (8.0%,4.8%,9.6%, 7.2%, &3.2%); respectively. While in post program there was improvement of patient's self – efficacy and became (76.8%, 76.8%, 75.2%, 86.4%, &88.8%); respectively, and slightly decreased in follow up to become (72.8%, 74.4%, 72.0%, 80.8%, &79.2%).

Table (6): shows the total score of stroke self-efficacy among studied patients; It was found that there were statistically significant differences between the level of stroke self-efficacy among stroke patients in pre, post, and follow-up from the training program application (0.000*).

Figure (3): illustrates the correlation between score of caregiver's knowledge and practices at Assiut university hospital; It was revealed that there was a statistically significant difference between knowledge and practices score in pre, post training program application and follow up (P- value= 0.000*) and also there was a positive correlation between them (r= 0.434, 0.764, & 0.717) respectively.

Table (7): shows the relation between patients' self-efficacy score and their demographic data; it was found that there wasn't statistically significant differences between patients' self-efficacy score and their demographic data related to gender, age, marital status, level of education, and residence) (P value= 0.990, 0.125, 0.417, 0.800 & 0.663) respectively.

Table (8): illustrates the relationship between patients' self-efficacy score and their clinical data; it was cleared that there wasn't statistically significant differences between patients' self-efficacy score and their medical history related to type of stroke, duration, onset of stroke, periodicity of follow up and family history of stroke diseases) (P value= 0.607, 0.121, 0.354, 0.723 & 0.236) respectively.

Table (9): shows the relation between caregivers' demographic data, their knowledge and practice scores; It was found that there wasn't statistically significant differences among caregivers' demographic data, their knowledge and practice scores throughout program phases regarding to gender, marital status, level of education, and residence. While, only statistically significant differences were observed related to their age between pre and post training program application (0.028*).

Table (10): clears the relation between patients' self-efficacy score and their caregivers' demographic data; It was found that there weren't statistically significant differences between patients' self-efficacy score and caregivers' demographic data related to gender, age, marital status, level of education, and residence. On the other hand, there was only statistically significant differences between patients' self-efficacy and place of caregivers living (0.050*).

Table (1): Demographic data of stroke patients and their caregivers at Assiut University Hospital, 2019.

| Demographic data	Patients		Caregivers		
	No=125	%	No=125		%
Gender:					
Male	70	**56.0%**	70		**56.0%**
Female	55	44.0%	55		44.0%
Age: (years)			**Age:**		
50<65	51	**40.8%**	<20	21	16.8%
65<80	54	43.2%	20-40	77	**61.6%**
80 and more	20	16.0%	>40	27	21.6%
Marital status:					
Single	22	17.6%	44		35.2%
Married	100	**80.0%**	81		**64.8%**
Widowed	1	0.8%	0		0.0%
Divorced	2	1.6%	0		0.0%
Educational level					
Illiterate	38	30.4%	16		12.8%
Read and write	48	**38.4%**	18		14.4%
Primary	16	12.8%	15		12.0%
Preparatory	17	13.6%	45		**36.0%**
Secondary	6	4.8%	31		24.8%
Occupation:					
Employee	29	23.2%	53		**42.4%**
Housewife	50	**40.0%**	15		12.0%
Freelancers	7	5.6%	46		36.8%
Retirement	4	3.2%	0		0.0%
Farmer	20	16.0%	3		2.4%
Not work	15	12.0%	8		6.4%
Residence:					
Rural	83	**66.4%**	81		**64.8%**
Urban	42	33.6%	44		35.2%
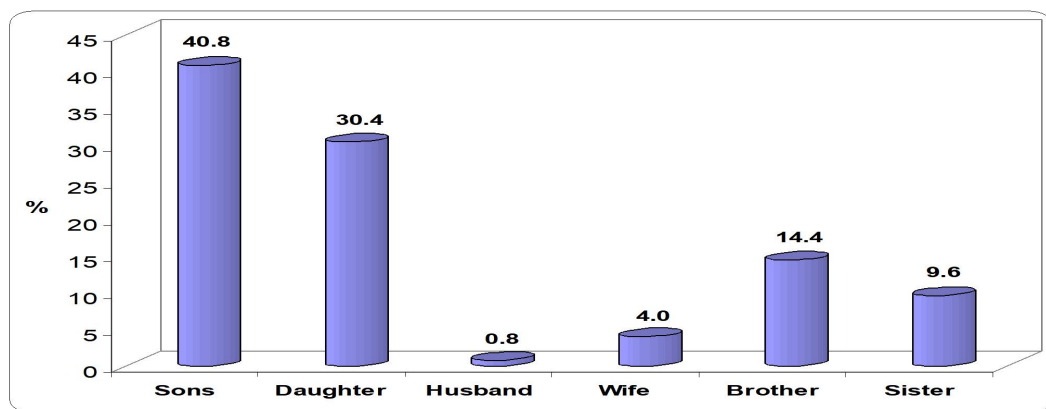
Figure (1): Relevancy of caregivers for stroke patients at Assiut university hospital, 2019 (N. = 125).
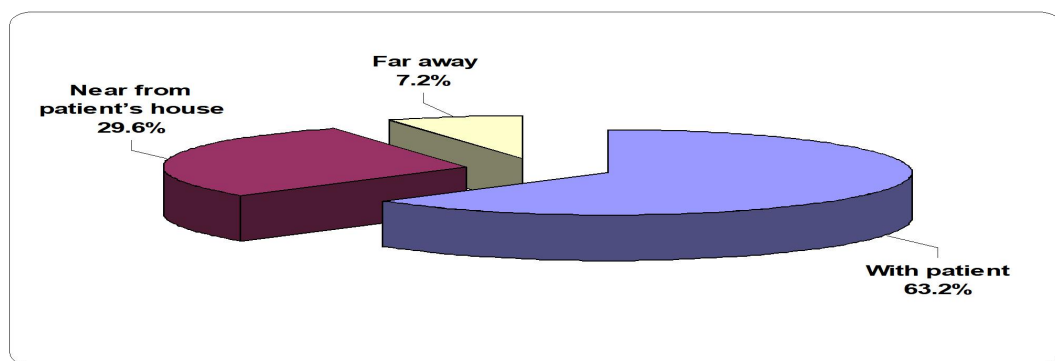
Figure (2): the place of caregivers' living for stroke patients, 2019 (N. = 125).

Table (2): Clinical data of stroke patients at Assiut University Hospital, 2019.

Clinical data	n=125	%
Type of stroke:		
Ischemic stroke	83	**66.4%**
Hemorrhagic stroke	42	33.6%
Duration of illness:		
< 1 year	73	**58.4%**
1-2 year	38	30.4%
> 2 year	14	11.2%
Onset of stroke:		
Acute	88	**70.4%**
Recurrent	37	29.6%
Present complaints:#		
Loss of memory	12	9.6%
Dysphagia	18	14.4%
Diarrhea	3	2.4%
Constipation	5	4.0%
Urinary incontinence	20	16.0%
Dry skin	16	12.8%
Hemiparesis	55	**44.0%**
Dry cough	87	**69.6%**
Type of food intake:		
Liquids	45	36.0%
Semi-liquids	63	**50.4%**
Solid	17	13.6%
Periodicity of follow-up:		
Monthly	32	25.6%
If needed	72	**57.6%**
For complain	21	16.8%
Family history of stroke diseases:		
Yes	48	38.4%
No	77	**61.6%**
Patient risk factors for stroke:#		
Diabetes	44	**91.7%**
Heart disease	7	14.6%
Hypertension	41	**85.5%**

More than one answer.

Table (3): knowledge score of caregivers' about stroke at Assiut University Hospital, 2019.

Knowledge score level	Pre program No.=125		Post program No.=125		Follow-up No.=125		P-value[1]	P-value[2]
	No.	%	No.	%	No	%		
Unsatisfactory	119	95.2	19	15.2	30	24.0	0.000*	0.000*
Satisfactory	6	4.8	106	84.8	95	76.0		
Mean ± SD	6.85 ± 4.50		27.94 ± 7.57		25.02 ± 8.46		0.000*	0.000*

P-value[1]comparison between pre and post-test **P-value[2]**comparison between post-test and follow up.

Table (4): Practices score levels of caregivers for care of stroke patients' pre, post and follow-up program at Assiut University Hospital, 2019.

| Practices score level	Pre program n=125		Post program (3 month) n=125		Follow-up (6 months) n=125		P-value[1]	P-value[2]
	n=125	%	n=125	%	n=125	%		
Inadequate	125	100.0	35	28.0	31	24.8	0.000*	0.000*
Adequate	0	0.0	90	72.0	94	75.2		
Mean ± SD	4.80 ± 2.77		22.92 ± 6.28		22.47 ± 6.57		0.000*	0.000*

P-value[1]comparison between pre and post-test **P-value[2]**comparison between post-test and follow up

Table (5): Distribution of self-efficacy among stroke patients in pre, post and follow-up after the training program at Assiut University Hospital, 2019**.**

Self-efficacy daily activates	Preprogram n=125				Post program (3 month) n=125				Follow-up (6 months) n=125			
	Not at all Confident		Very Confident		Not at all confident		Very Confident		Not at all Confident		Very confident	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Get comfortable in bed every night	121	96.8	4	3.2	32	25.6	93	**74.4**	23	18.4	102	**81.6**
Get out of bed by yourself even when you feel tired	119	95.2	6	4.8	38	30.4	87	**69.6**	40	32.0	85	**68.0**
Walk a few steps inside your house without help	115	92.0	10	**8.0**	29	23.2	96	**76.8**	34	27.2	91	**72.8**
Move in house to do most things you want	120	96.0	5	4.0	51	40.8	74	59.2	60	48.0	65	52.0
Walk safely outside your house	120	96.0	5	4.0	77	61.6	48	38.4	80	64.0	45	36.0
Use both your hands for eating food	119	95.2	6	4.8	29	23.2	96	**76.8**	32	25.6	93	**74.4**
Dress and undress yourself even when you feel tired	121	96.8	4	3.2	50	40.0	75	60.0	44	35.2	81	64.8
Prepare a meal you would like to yourself	114	91.2	11	**8.8**	56	44.8	69	55.2	65	52.0	60	48.0
Persevere to make progress from your stroke after discharge from therapy	113	90.4	12	**9.6**	31	24.8	94	**75.2**	35	28.0	90	**72.0**
Do your own exercise program every day	116	92.8	9	**7.2**	17	13.6	108	**86.4**	24	19.2	101	**80.8**
Cope with the frustration of not being able to do some things because of your stroke.	121	96.8	4	**3.2**	14	11.2	111	**88.8**	26	20.8	99	**79.2**
Continue to do most of the things you liked to do before your disease.	121	96.8	4	3.2	66	52.8	59	47.2	83	66.4	42	33.6
Keep getting faster at the tasks that have been slow since your disease.	123	98.4	2	1.6	81	64.8	44	35.2	94	75.2	31	24.8

Table (6): Total score of self-efficacy for stroke patients, at Assiut University Hospital, 2019.

Stroke self-efficacy score	Pre program No.=125	Post program (3 month) No.=125	Follow-up (6 months) No.=125	P-value[1]	P-value[2]
Mean ± SD	14.00 ± 10.63	84.08 ± 33.27	78.80 ± 32.42	0.000*	0.000*
Median (IQR)	10 (10-20)	80 (60-110)	80 (50-100)		

P-value[1]Comparison between pre-test and post-test
P-value[2]Comparison between post-test and follow up-test
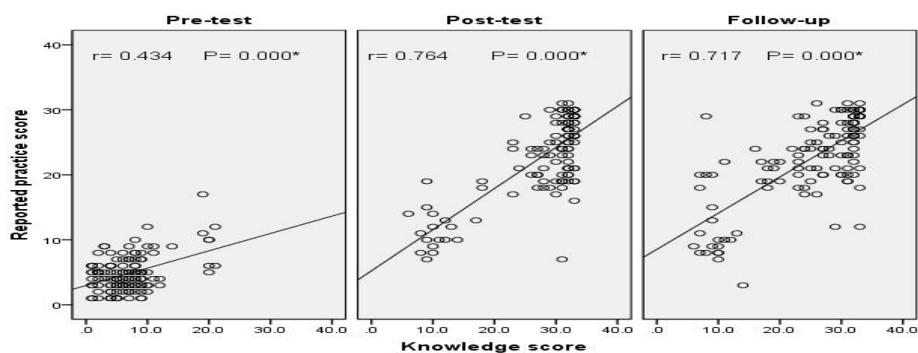
Figure (3): Correlation between score of caregiver's knowledge and practices at Assiut University Hospital, 2019.

Table (7): Relation between stroke patients' self-efficacy and their demographic data at Assiut University Hospital.2019.

Demographic Variables	Self-efficacy score (No.=125)		P-value
	Mean ± SD	Median (IQR)	
Gender:			
Male	14.00 ± 10.55	10.0 (10.0-20.0)	0.990
Female	14.00 ± 10.82	10.0 (0.0-20.0)	
Age: (years)			
50<65	13.92 ± 11.33	10.0 (0.0-20.0)	
65<80	15.56 ± 9.84	20.0 (10.0-20.0)	0.125
80 and more	10.00 ± 10.26	10.0 (0.0-20.0)	
Marital status:			
Single	12.27 ± 8.13	10.0 (10.0-20.0)	0.417
Ever-married	14.37 ± 11.09	10.0 (0.0-20.0)	
Level of education:			
Illiterate	15.26 ± 10.84	20.0 (10.0-20.0)	
Read and write	12.71 ± 10.67	10.0 (0.0-20.0)	
Primary	13.75 ± 10.25	10.0 (10.0-20.0)	0.800
Preparatory	15.29 ± 10.07	20.0 (10.0-20.0)	
Secondary	13.33 ± 13.66	10.0 (0.0-30.0)	
Residence:			
Rural	13.73 ± 11.12	10.0 (0.0-20.0)	0.663
Urban	14.52 ± 9.68	10.0 (10.0-20.0)	

Table (8): Relation between stroke patients' self-efficacy and their clinical data at Assiut University Hospital, 2019.

Clinical data	Self-efficacy score (n=125)		P-value
	Mean ± SD	Median (IQR)	
Type of stroke:			
Ischemic stroke	**14.34 ± 10.38**	10.0 (10.0-20.0)	0.607
Hemorrhagic stroke	13.33 ± 11.19	10.0 (0.0-20.0)	
Duration:			
< 1 year	**15.62 ± 10.41**	20.0 (10.0-20.0)	
1-12 year	11.84 ± 10.87	10.0 (0.0-20.0)	0.121
> 12 year	11.43 ± 10.27	10.0 (0.0-20.0)	
onset of stroke:			
Acute	**14.55 ± 10.49**	10.0 (10.0-20.0)	0.354
Recurrent	12.70 ± 10.97	10.0 (0.0-20.0)	
Periodicity of follow-up:			
Monthly	**15.00 ± 10.47**	10.0 (10.0-20.0)	
If needed	13.33 ± 10.48	10.0 (0.0-20.0)	0.723
For complain	14.76 ± 11.67	20.0 (0.0-20.0)	
Family history of stroke:			
Yes	12.50 ± 9.34	10.0 (10.0-20.0)	0.236
No	**14.94 ± 11.31**	20.0 (0.0-20.0)	

Table (9): Relation among caregivers' demographic data, knowledge and practices at Assiut University Hospital, 2019.

Demographic data	Knowledge score Mean ± SD	Practice score Mean ± SD
Gender:	**(P-value) 0.395**	**(P-value) 0.300**
Male	6.54 ± 3.79	4.57 ± 2.40
Female	7.24 ± 5.28	5.09 ± 3.18
Age: (years)	**(P-value) 0.028***	**(P-value) 0.112**
< 20	9.19 ± 5.24	5.95 ± 2.75
20-40	6.49 ± 4.07	4.57 ± 2.73
> 40	6.04 ± 4.66	4.56 ± 2.79
Marital status:	**(P-value) 0.057**	**(P-value) 0.697**
Single	7.89 ± 5.30	4.93 ± 2.95
Married	6.28 ± 3.93	4.73 ± 2.68
Level of education:	**(P-value) 0.191**	**(P-value) 0.700**
Illiterate	5.63 ± 2.31	4.38 ± 2.60
Read and write	5.39 ± 2.95	5.44 ± 2.20
Primary	7.40 ± 5.95	5.33 ± 2.35
Preparatory	7.93 ± 5.13	4.58 ± 3.14
Secondary	6.48 ± 4.11	4.71 ± 2.82
Residence:	**(P-value) 0.600**	**(P-value) 0.493**
Rural	6.69 ± 4.66	4.93 ± 2.54
Urban	7.14 ± 4.23	4.57 ± 3.17

Table (10): Relation between stroke patients' self-efficacy and caregivers' demographic data at Assiut University Hospital, 2019.

Demographic data	Self-efficacy score (No.=125)		P-value
	Mean ± SD	Median (IQR)	
Gender:			
Male	14.43 ± 10.16	10.0 (10.0-20.0)	0.564
Female	13.45 ± 11.26	10.0 (0.0-20.0)	
Age: (years)			
< 20	13.33 ± 8.56	10.0 (10.0-20.0)	
20-40	14.81 ± 11.08	10.0 (10.0-20.0)	0.544
> 40	12.22 ± 10.86	10.0 (0.0-20.0)	
Marital status:			
Single	13.86 ± 10.39	10.0 (10.0-20.0)	0.919
Married	14.07 ± 10.81	10.0 (0.0-20.0)	
Level of education:			
Illiterate	9.38 ± 10.63	5.0 (0.0-20.0)	
Read and write	15.56 ± 10.42	15.0 (10.0-20.0)	
Primary	12.67 ± 11.00	10.0 (0.0-20.0)	0.368
Preparatory	14.44 ± 10.56	20.0 (10.0-20.0)	
Secondary	15.48 ± 10.60	10.0 (10.0-30.0)	
Residence:			
Rural	13.46 ± 11.20	10.0 (0.0-20.0)	0.416
Urban	15.00 ± 9.52	10.0 (10.0-20.0)	
Place of caregivers living:			
With patient	15.19 ± 10.24	10.0 (10.0-20.0)	
Near from patient's house	10.54 ± 10.79	10.0 (0.0-20.0)	**0.050***
Far away	17.78 ± 10.93	20.0 (10.0-30.0)	

Discussion:

The survival rate of stroke has significantly improved in recent years. However, there are still a large number of stroke survivors experiencing severe dysfunctions **(Saposnik, 2010).**

Caregiver training may reduce the burden and improve their confidence in providing care to the patient. The provision of information alone has been shown to improve caregivers' knowledge and satisfaction. In various developed countries, transition care programs have been developed to address the need for caregiver training and post-discharge support to ensure patient and caregiver safety **(Smith, et al., 2009 and Watkins, e t al., 2012).**

Discussion of the present study results was covered the following items; the demographic data of the study participants (patients and their caregivers), caregiver's knowledge and practice for caring of stroke patient. In addition to; the stroke patient self-efficacy and correlational items. The current study results was supported the hypotheses that expected before implementing of a training program that was cited as follow 'caregiver training program have a positive effect on stroke patients self-efficacy.

Regarding demographic data of stroke patients and their caregivers, the present results cleared that the higher percentages of stroke patients were males in the age group from 65 to less than 80

years; were married; read and write; housewives; and comes from rural areas. The demographic data of caregivers and stroke patients, as the present study results indicated it was matched each other in terms of some variables included gender, marital status, and residence. Overall; it can be concluded that the two groups were homogeneous.

In this regard, the study conducted by **Khorrami, et al., (2016)** entitled" Assessing the effectiveness of home nursing care plan on activities of daily living of stroke patients in Urmia city" they originated that; most stroke patients participating in the research were married and men with a low level of literacy.

Furthermore; the study done by **Azimi, et al., 2013** about "The effect of home-based stroke rehabilitation on quality of life of stroke survivors and their family caregiver's strain". Stated that the participant's patient had a mean age of 62 years and low levels of education.

Likewise, most study sample *in* the research by **Mohammadi, et al., (2013)** founded that most patients' participants had primary levels of education.

Concerning;   the   caregiver's demographic data. The present findings were revealed that the higher percentages of relatives were males; aged from 20-40 years; married; had preparatory school education; employee; and came from rural areas. This finding is in agree with findings of **Yang, et al., (2016)** their showed that the majority of the caregiver were male. This may be related to the increasing number of male patients in studied sample who need special care from personnel similar to them and willing to coping with them.

Instead, this finding is disagreement with **Chen, et al., (2012)** who reported that the stroke patient caregivers in his study were predominately female; there is a traditional cultural expectation of women being the family caregivers.

Also, the current results is consisted with **Kumar, and Kaur, (2015)** who found that the higher percentages of caregivers of patients with stroke were in age group between twenty to fifty years; degree of relations were sons and daughters, were married, and employers.

As regards **the place of caregivers' living;** the present study found that the majority of patients' caregivers were lived with their elderly patients. This result had positive outcome related to patients and their caregivers. Where presence of caregivers beside their patients had great impact on good psychological condition of their patients and facilitate interaction between patients and their care givers.

Regards to **the degree of the relationship of caregivers with patients**. The findings showed that the higher percentage of relatives were sons and daughters respectively. This result may be due to two causes; firstly**,** the caregivers who stayed with their patients were sons and daughters respectively who were the nearest people to the patients. Where, they were more supported to their patient physically and psychologically. Secondly**;** the caregivers who stayed with their patients in hospital were sons. While, males individuals in southern society was shoulder responsibilities of their family also, preferred to accompany their patients in hospital.

According to **clinical data of stroke patients** the present results revealed that the higher percentages of patients are suffering from ischemic stroke; duration of stroke for less than one year; the onset

of stroke was acute. Also, most patients complain of dry cough. As regarding the type of food intake most patients had semi-liquid food; came to the hospital for follow-up when needed; hadn't a family history of stroke disease; and had diabetes followed by hypertension respectively as patient risk factors for stroke.

This result at the same line with a similar finding study of **Yang, et al., (2016)** who reported that ischemic stroke accounted for the vast majority of the stroke lesion types, and more than half of the participants. Also, this finding corresponds with the results of **Kumar and Kaur, (2015)** found that the higher percentages of stroke patients had infarction, the predisposing factor of stroke was smoking, also, stroke patients were suffer from constipation. As well as; **Abd El-Aziz, et al., (2013)** entitled "Impact of counseling intervention to promote adaptability and self-efficacy among stroke patients and their family caregivers during rehabilitation stage at Asser General Hospital" indicates that most of the study sample were suffering from ischemic stroke with acute onset of the disease; less than one month; and the sample was eating soft foods.

On the other hand; the current finding is contradicted with the finding of **Abd El-Aziz, et al., (2013)** who reported that all patients were suffering from hypertension, and complained of dysphagia and urinary incontinence while below half of the patients complained of loss of memory and dry skin with poor integrity.

The current study showed that there were statistically significant differences among knowledge of caregivers about stroke disease in pre, post-program, and follow-up.

This result is in the same line with the study of **Abd El-Aziz, et al., (2013)** who demonstrated that the family caregiver's knowledge about the care of stroke patients was improved during rehabilitation program stages. In addition to, there are highly increases in caregivers' level of knowledge in pre and post training program intervention, while it slightly decrease during follow up.

Concerning **caregivers practice** of about special care for stroke patients. The results of the present study found that there were statistically significant differences between the practice level for caregivers in pre, post training program application training program application and follow up.

This result is consistent with the finding of **Abd El-Aziz, et al; (2013)** who mentioned that there were significant differences between pre and post-program regarding caregiver's observational practices, in caring for their post stroke patients like transferring the patients to or from the chair, external catheter care, and precautions given to prevent complications of bed ridden.

The present findings noted that there is highly an increase in caregivers' level of practice among pre, post and follow up after program intervention. This finding was congruent with the result, of a study conducted by **Abd El-Ghany, (2006)** who found that there is a significant improvement in knowledge and practices after program intervention. Similarly; **Smith, et al., (2006)** highlighted the benefits of education and training of family caregivers of stroke patients regarding knowledge that allows positive outcome.

Self-efficacy is one psychological construct that has received great attention in the management of stroke patient. It

has been defined as "people's beliefs about their capabilities to produce designated levels of performance that exercise influence over events that affect their lives". Self-efficacy beliefs can determine how people feel, think, motivate themselves and behave with regards to their health **(Jones & Riazi 2011)**.

Moreover; the findings of current study documented that in the pre program, the higher percentages of self-efficacy scores among stroke patients were as follows persevere to make progress from disease; prepare their preferred meal by themselves; walk a few steps inside the house without help; and made daily exercises. While in post program, the higher percentages of self-efficacy scores were in the following items cope with the frustration of not being able to do something because of disease; made daily activity exercises; use both hands for eating food; walk a few steps inside the house without help; get comfortable in bed every night; and get out of bed even when fell tired.

While at follow up post training program application, the higher percentages of self-efficacy scores were in the following items (made daily activity exercises; get comfortable in bed every night; Cope with the frustration of not being able to do something because of disease; use both hands for eating food; walk a few steps inside the house without help; and get out of bed even when fell tired).

Otherwise, the present study highlighted of stroke self-efficacy among stroke patients. It was found that there were statistically significant differences between the level of stroke self-efficacy among patients in pre, post, and follow-up. This finding is in agreement with a study conducted in the Netherlands

by **Jaap and Thóra, (2011)** entitled "Self-efficacy and its influence on the recovery of patients with stroke ". They pointed in his study that stroke patients with high self-efficacy are functioning better in daily activities living performance than patients with low self-efficacy.

Correspondingly, the study by **Rang, et al., (2020)** entitled "Effects of virtual reality training on occupational performance and self-efficacy of patients with stroke", found that stroke patient training could help in enhancing and improving the self-efficacy and activities of daily living of patients with stroke and improvement in upper limb functions.

Self-efficacy was positively associated with patient mobility, activity daily living, self-efficacy enhancing interventions, such as task-oriented walking group exercise program and group education intervention were found to be effective and improved various patient outcomes.

Also, this finding agrees with **Eames, et al., (2012)** who showed that intervention group participants had improved self-efficacy for accessing stroke information and satisfaction with program information. Also; **Korpershoek, et al., (2011)** found that patients with high self-efficacy are functioning better in daily activities than patients with low self-efficacy level. Furthermore **Mazurek and Gieracha, (2020)** found that self-efficacy level is significantly related to rehabilitation outcomes.

The findings of the present study indicated that implementing the training program in patients with stroke was effective and yielded positive patient outcomes. This result was congruent with a study conducted in Malaysia by **Chai, et al., (2020)** entitled

"Caregiving self-efficacy and knowledge regarding patient positioning among Malaysian caregivers of stroke patients" who mentioned that the caregivers receiving training program for caring for their stroke patient were independently associated with better self-efficacy.

Findings from this study discovered that there was a statistically significant difference between caregiver's knowledge and practices throughout program phases in pre, post and follow-up for the training program and also there was a positive correlation between them. This suggests that as more health knowledge becomes available, efficiency improves and accuracy improves, even at the level of everyday activities.

These results consisted of a study by **Shakibi, et al., (2007)** about "Effect of self-care training on the rehabilitation of patients with hemiplegic stroke" confirmed the results of the present research. The results of this research showed that there was a significant difference before and after self-care training to stroke patients resulted in improved functioning in these patients.

The present study results reported that there weren't statistically significant differences between patients' self-efficacy score with their demographic and clinical data. Also the results of the present study found that there weren't statistically significant differences among caregivers' demographic data, their knowledge and practice scores related to gender, marital status, level of education, residence in pre and post training program and also in between the post and follow-up.

Nevertheless, only statistically significant differences between caregivers' age and their knowledge. This finding explained and rationales as the results of the present study revealed that the higher percentage of age among caregivers was in the age group 20-40 years. Generally, this finding may be due to, the younger people are motivated and interested to gain knowledge related to health and topics related to prevention and management of health problems. Especially family caregivers who have a sick person need knowledge and search about it to help their patients to reach recovery.

These findings of the current study was not supported by **Fathin, et al., (2017)** who stated that older caregivers had better self-efficacy, whereas younger caregivers had other family and financial obligations to cope with, being married contributed better social support to the caregiver, and hence improved self-efficacy. Lower education was unexpectedly associated with better self-efficacy. This again could be due to their employment status, freeing them to provide care for the patients. Similarly; **Lina, et al., (2017)** who demonstrate that multimodal interventions can improve long-term perception of recovery, as well as balance, gait, grip strength, and working memory in a mixed population of individuals in late phase after stroke.

Somewhere**,** this study noted that there weren't statistically significant differences between patients' self-efficacy score and caregivers' demographic data related to (sex, age, marital status, level of education, and residence) respectively. On the other hand, there were only statistically significant differences between patients' self-efficacy and place of caregivers living. This means those patients need for continues care and support for improve their self-efficacy.

Conclusion:

The study concluded that the training program for caregivers had a positive influence on the self-efficacy of the stroke patient. Patients with high self-efficacy perform better than patients with low self-efficacy in day-to-day activities.

Recommendations:

In the light of the study findings, the following recommendations are suggested: Continues training program for caregivers regarding special care of stroke patients to improve their self-efficacy. Further studies emphasize the role of self-efficacy in the care for stroke patients.

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