Knowledge and Practices of geriatric patients about stroke prevention at Assiut University Hospital

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Abstract:
Stroke is a major public health problem affecting primarily older adults. **Aim:** To determine the effect of an educational program on the knowledge and practices of geriatric patients about stroke prevention at Assiut University Hospital. **Subjects and Methods: A** randomized control trail design was used. The current study included 170 geriatric patients (85 study group and 85 control group) in outpatient clinics. Three tools were used: Socio-demographic and clinical data on geriatric patients, structured interview schedules, patients' knowledge about stroke prevention, and patients' practices about stroke prevention **Results:** The study revealed that the mean scores of their knowledge rose from 25.58 ± 9.92 pre-program intervention to 47.91 ± 7.14 immediately post-program and 37.56 ± 4.62 three months post-program, while 71% of the studied geriatric patients had a poor practice score that decreased to 15.3% after three months of program implementation. **Conclusion:** There was a significant statistical difference between the pre-test program and the follow-up program in knowledge score and practice score. **Recommendation:** Periodic health education programs should be implemented to increase awareness and involve stroke-risky patients in program design and monitoring.

Keywords: Geriatric patients, Knowledge, Practice & Stroke.

Introduction
Stroke is a major public health problem affecting primarily older adults. It is the fifth leading cause of death in the United States and is surpassed only by heart disease worldwide. In the United States, nearly 800,000 new strokes occur annually. Stroke is also a leading cause of disability, with an estimated six million stroke survivors living in the United States with stroke-related deficits. Stroke patients over the age of 85 make up approximately 20% of all stroke patients. **(Thaler & Fara 2023).**

There are numerous risk factors for stroke, including both modifiable (e.g., diet, comorbid conditions) and non-modifiable risk factors (e.g., age, race). In addition, risk factors may also be thought of as short-term risks or triggers (e.g., infectious events, sepsis, stress), intermediate-term risk factors (e.g., hypertension, hyperlipidemia) and long-term risk factors for stroke (e.g., sex, race). Risk factors for stroke in the young also likely differ from those in older patients**. (Boehme et al., 2017).**

Individuals who are 75 years of age or older account for more than half of all strokes. The stroke case-fatality average is higher in females than in males. Between the ages of 45 and 75, males have a higher frequency of stroke than females. However, after the age of 75, the incidence of stroke is higher in women than in men; overall, females have a higher lifetime stroke risk than males. It is predicted that the annual number of strokes will reach 1 million by the middle of the 21st century **(Jankovic et al., 2022).**

Preventing a first stroke is critical because it accounts for more than 75% of all strokes. Adopting a healthy lifestyle, which includes avoiding tobacco use, eating a low-sodium and high-fruit and vegetable diet, engaging in at least 30 minutes of moderate exercise every day, and maintaining a body mass index less than 25 kg/m2, can significantly decrease the risk of having a stroke. Studies indicate that such a lifestyle modification reduces the risk of primary stroke by 80% compared to those who do not follow these habits. (**Diener & Hankey, 2020; Bress et al., 2017**). Most strokes can be prevented by blood pressure control, good nutrition, consistent exercise, and smoking cessation. An interstroke study showed that high BP, improper diet, physical inactivity, smoking, and abdominal obesity put 82% and 90% of people at risk for stroke, respectively. Controlling vascular risk causes significant inhibition of secondary stroke and contains diabetes, smoking cessation, fats, and particularly high blood pressure. (**Kleindorfer et al., 2021**)

Nurses have a significant role in stroke prevention by assisting ill people in managing their health risks through the implementation of different behavioral and psychological interventions, connecting them to community resources, and working together with other healthcare professionals. They provide patients with guidance and recommendations on lifestyle

behaviors such as smoking cessation, reduced alcohol intake, healthy eating habits, physical activity, and managing risk factors through lifestyle modifications **(Chimberengwa & Naidoo, 2019)**.

Nurses play a critical role in educating ill people about the importance of a healthy lifestyle in accomplishing effective control of their health. Poor patient information can hinder the adoption of lifestyle modifications, which is why nurses focus on educating patients about the significance of healthy behaviors **(Powers et al., 2019).**

Significance of the study
Globally, there are 10.3 million new strokes (67% ischemic) annually with higher disability rates in lower- and middle-income countries. Disparities between high- and low-income countries have increased the incidence and burden associated with the costs of care and disability after stroke **(Green et al., 2021).**

Stroke is a major health problem in the Egyptian population. Studies from 31 articles published from 1983-2008 from 10 Arabian countries that did not include Egypt, found that the annual incidences of stroke in these countries ranged from 27.5 to 63 per 100,000, with prevalence of stroke between 42 and 68 per 100,000; these values were far lower than the corresponding incidence and prevalence of stroke in Egypt. The total number of geriatric patients with stroke was 20,508 at Upper Egypt **(Abd-Allah et al., 2018)**.

In spite of the illness problem, there is a massive indication practice hole that can be the reason that the amount of innovative stroke in Egypt annually might be about 150 000 to 210 000 **(Abd-Allah et al., 2018).**

In America, the prevalence of stroke in persons older than 65 years has been cited as approximately 60 in 1000, and in persons 75 years of age and older, 95 per 1000. It is estimated that 1 in 200 individuals will sustain a stroke. Although stroke is the fifth leading cause of death in the United States, approximately 75% of stroke victims survive, often with post-stroke sequelae, such as impaired mobility, changes in cognitive function, and urinary urgency, frequency, and incontinence. **(Partin et al., 2021).**

Aim of the study
To determine the effect of an educational program on the knowledge and practices of geriatric patients about stroke prevention at Assiut University Hospital.

Specific objectives:
1. To assess geriatric patients' knowledge about stroke prevention at Assiut University Hospital.
2. To assess geriatric patients' practices about stroke prevention at Assiut University Hospital.

Research Hypothesis
The study group will have good knowledge and practices about stroke prevention after implementing the nursing educational program.

Subjects and Method
Research design:
A randomized control trail research design was used.
Setting:
The research was carried out in outpatient clinics (internal medicine and cardiac outpatient clinics) at Assiut University Hospitals. Internal medicine outpatient clinics consist of two rooms (the first room for male patients and the second room for female patients), and cardiac outpatient clinics consist of one room. The participants must be diagnosed with hypertension, diabetes mellitus, and cardiac diseases, so this setting was chosen for this study.
Subjects:
The participant group was a systematic random sample of geriatric patients. Based on the sample size calculated using the online Sample Size Calculator (Raosoft), the study sample is determined to be 132. The sample was calculated after setting the margin of error at 5% and the confidence interval at 95%, and the population size is estimated to be around 230 geriatric patients in the outpatient clinics of the hospital. A 10% non-response error should be added, which makes the final sample size 170 geriatric patients. The geriatric patients fulfilled the following criteria: age 60 years and older, ability to communicate, and diagnosis with hypertension, diabetes mellitus, and cardiac diseases. They were randomly divided equally into two groups: study and control groups, with 85 patients in each group.
Tools of the study:
There were three tools used to conduct this research:
Tool I: Socio-demographic and clinical data for geriatric patients in a structured interview schedule: It was developed by the researcher after reviewing different research studies and pertinent literature for the conduct of the study. It included socio-demographic characteristics such as age, gender, education, career, and medical history.
Tool II: geriatric patients' knowledge about stroke prevention
This tool was developed by the researcher based on relevant literature to evaluate the geriatric patient's knowledge pre- and post-nursing educational program. It was used for both groups. It comprised 8 questions with 78 grades that measured the geriatric patients' knowledge about stroke prevention. Items are scored from zero to one, with zero for the wrong answer and one for the correct answer. The total score will be adjusted from 0 to 100 and can be classified as

good knowledge if the percent score is 75–100%, fair (50–75%), or poor knowledge if it is less than 50%.

Tools (III): geriatric patients' reported practices about stroke prevention

This tool was developed by the researcher based on relevant literature to evaluate the geriatric patient's practices before and after the nursing educational program. It was used for both groups. It comprised 12 questions with 23 grades that measured the geriatric patients' reported practices about stroke prevention. Items scored using a 4-point Likert scale in terms of frequency are as follows: never (N) = 1, sometimes (S) = 2, often (O) = 3, routinely (R) = 4. The total score will be adjusted from 0 to 100 and can classify the level of practice as poor (ranging from 0 to 33.3), fair (range from 33.4 to 66.6), or good (ranging from 66.7 to 100).

Validity : Panel of five experts in gerontological nursing and community health nursing at Assiut University to assess the study tools for clarity, applicability and comprehensiveness. Modifications made based on their recommendations (**Abd-Elaziz et al., 2014).**

Reliability: The reliability was analyzed by Cronbach's alpha coefficient test for the knowledge questionnaire and geriatric patients' practices. They were found to be 0.88 and 0.90, respectively (**Elbqry et al., 2019).**

Pilot study: The pilot study was carried out before starting data collection on 17 patients who were excluded from the study to assess the applicability, clarity, and feasibility of the study tools. These patients were selected from the previously mentioned study setting and were not included in the study. The necessary modifications were made accordingly.

Field work: The study started in beginning of December 2022 to the end of February 2023; data were collected from the previous mentioned setting. The researcher collected data five days per week, 4 hours each day from 9 am to 1:30 pm., and the average number which was interviewed was 2-3 elderly patients per day. The interviewer selected patients who fulfilled the criteria. The purpose and nature of the study were explained to each patient who agrees to participate in the study. An oral consent was obtained from participants and they were assured about confidentiality and privacy that the information will be used only for the purpose of research. Each patient was individually interviewed and the researcher recorded the answer in the Questionnaire sheet. The approximate time spent during the filling of sheet was around 20 to 25 minutes for each participant.

Methods of data collection:

The present study's data was collected from the beginning of December 2022 to the end of February 2023, five days a week. Data was collected through four phases:

Administrative phase:

Official permission to collect data was obtained from the Dean of the Faculty of Nursing at Assiut University to the director of Assiut University hospitals. This letter includes permission to carry out the study and explains the purpose and nature of the study.

Pre-test phase:

This phase was conducted before implementing the program to assess knowledge and practices regarding stroke prevention among geriatric patients through the knowledge questionnaire and practices this phase done by the researcher. The researcher met the participants, explained the aims of the study, and gave them instructions. The length of each interview ranged from about 20 to 25 minutes for filling out the questionnaire.

Intervention Phase:

This phase included the arrangement and implementation of the program and started after the pretest phase. The study group received an educational program, and the control group got a routine follow-up. It was implemented in small groups of 2–3 geriatric patients. The study group had two sessions. Every session took 90 minutes, plus 15 minutes for the rest period.

The program content was created based on the relevant literature and available resources to enhance patients' knowledge and practices about stroke prevention. The researcher gave patients a booklet of educational programs. The booklet was created in direct, simple Arabic language and featured mainly pictures to improve clarity and address the issue of illiteracy that is prevalent among geriatric patients. The telephone number of the patients was taken to arrange for upcoming meetings and made follow-ups.

Teaching methods

Discussions, demonstrations, and Power Point presentations

Media

Handout booklet and brochure were used

The sessions of the program:

The 1st session included two parts: Part I: orientation about importance, purpose, session of the program, and expectations; Part II: an introduction to stroke, the anatomy and function of the brain, pathophysiology of stroke, definition, risk factors, causes, signs and symptoms, complications, and health promotion lifestyle measures of stroke prevention such as nutrition, exercise, engaging in weight control measures, smoking cessation, appropriate treatment of diseases, and routine follow-up. This session was conducted via group discussion.

 The second session contained two parts: part I (theoretical part for exercises and measuring of blood sugar and blood pressure), definition of breathing exercises, purpose, advantage, time to perform breathing, indication and contradiction of performing exercise, steps of breathing exercises, and steps of measuring blood sugar and blood pressure. Part II: Applying breathing exercises and steps for measuring blood sugar and blood pressure. This session was conducted via group discussion and demonstration.

The geriatric patients performed the exercise three times a week for 16 weeks (4 weeks for implementing the program and 12 weeks after implementing but without observation), and the researcher followed their commitment.

Post and follow-up phases:
The evaluation was performed through a post-test immediately after the program's intervention. A follow-up test was performed three months after the end of the program to evaluate geriatric patients' knowledge and practices using the same pre-test tools I, II, and III.

Ethical consideration:
A research proposal was accepted by the ethical board in the Faculty of Nursing under ethical code number 2680031.The study adhered to common ethical principles, and the application of the study did not pose any danger to the study participants. Participants were given an explanation of the study's purpose, and oral consent was obtained from those who were willing to participate. Study subjects had the right to refuse to be involved in the study at any time. The privacy of the study subjects was taken into consideration during the data gathering process. They reassured that any obtained information would be strictly confidential

Statistical design :
Data entry and data analysis were done using SPSS version 22 (Statistical Package for Social Science). The data were presented as numbers, percentages, means, and standard deviations. An independent sample t-test was used to compare quantitative variables between two groups, and an ANOVA test was used for more than two groups. The Pearson correlation coefficient was used to measure the correlation between quantitative variables. P-value is considered statistically significant when p-value < 0.05.

Results

Table (1): Socio-demographic characteristics and clinical data of geriatric patients.

Items	Study (n= 85)		Control (n= 85)		P-value
	No.	%	No.	%	
Age: (years)					
60 - < 70	57	67.1%	60	70.6%	0.619
70 - < 80	28	32.9%	25	29.4%	
Sex:					
Female	44	51.8%	28	32.9%	
Male	41	48.2%	57	67.1%	0.013*
Educational level:					
Illiterate	45	52.9%	19	22.4%	
Read & write	15	17.6%	19	22.4%	
Basic education	14	16.5%	29	34.1%	0.000*
Secondary	9	10.6%	18	21.1%	
University	2	2.4%	0	0.0%	
Occupation:					
Not working/ house wife	47	55.3%	28	32.9%	
Working	38	44.7%	57	67.1%	0.001*
Health problem#:					
Hypertension	65	76.5%	72	84.7%	0.175
Diabetes mellitus	49	57.6%	31	36.5%	0.006*
Cardiac diseases	14	16.5%	31	36.5%	0.003*
Sleep apnea	2	2.4%	0	0.0%	0.497
Covid- 19 virus	2	2.4%	0	0.0%	0.497

* There is signifcant difference   *\# More than one answer was mentioned*

Table (2): The total knowledge score of geriatric patients about stroke

Items	Study (n= 85)	Control (n= 85)	P-value[1]
	Mean ± SD	Mean ± SD	
Pre-test	25.58 ± 9.92	24.31 ± 8.06	0.365
Post-test	47.91 ± 7.14	25.58 ± 6.05	0.000*
Follow-up	37.56 ± 4.62	26.11 ± 8.41	0.000*
P-value[2]	0.000*	0.251	
P-value[3]	0.000*	0.160	

* There is significant difference   *P-value1: Control between study group and control group*
 P-value1: Control between pre-test and post-test   *P-value2: Control between post-test and follow-up*

**Table (3): Distribution of geriatric patients 'practices about stroke prevention**

Items	Practice level	Study (n= 85)		Control (n= 85)		P-value[1]
		No.	%	No.	%	
Pre-test	Poor	61	71.8%	65	76.5%	0.603
	Fair	18	21.2%	13	15.3%	
	Good	6	7.1%	7	8.2%	
Post-test	Poor	9	10.6%	62	72.9%	0.000*
	Fair	17	20.0%	14	16.5%	
	Good	59	69.4%	9	10.6%	
Follow-up	Poor	13	15.3%	67	78.8%	0.000*
	Fair	25	29.4%	12	14.1%	
	Good	47	55.3%	6	7.1%	
P-value[2]		0.000*		0.836		
P-value[3]		0.000*		0.929		

* There is signifcant difference   *P-value1: Control between study group and control group*
 P-value2: Control between pre-test and post-test   *P-value3: Control between post-test and follow-up*
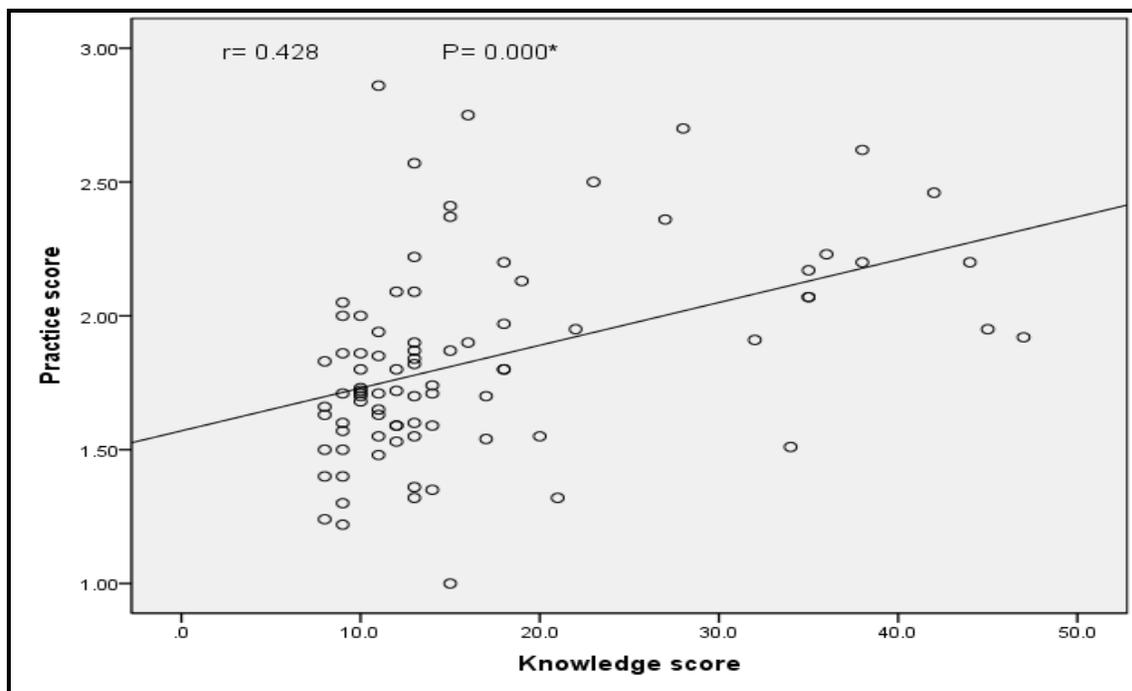
* P-value is statistically significant difference at ≤ 0.000

Figure (1): The relation between total score of study geriatric patients' knowledge and practice about stroke prevention.

Table (1): Showed the Socio-demographic characteristics and clinical data of geriatric patients' in the study and control groups. It was revealed that 48.2% of the study group and 67.1% of the control group were male. Regarding geriatric patients' education, it was found that (52.9%) of the study group were illiterate and (34.1%) of the control group had basic education. Regarding geriatric patients' Occupation, it was found that (55.3%) of the study group and (32.9%) of the control group didn't work. It was found that 76.5 percent of the study group and 84.7 percent of the control group have hypertension.

Table (2): Showed the knowledge score of the studied sample. This table demonstrated that there was significant improvement in the total score of knowledge of the study group (p 0.05), where the mean scores of their knowledge, 25.58 ± 9.92 pre-program intervention, 47.91 ± 7.14 immediately post-program intervention, and 37.56 ± 4.62 three months post-intervention. It showed statistical signifcant difference between the study and control groups concerning the total score of knowledge (p < 0.000).

Table (3): Showed that (7.1%) of the geriatric patients had a good practice score about stroke in the pre-test, (69.4%) of them had a good practice score in the post-test, and (55.3%) of them had a good practice score in the follow-up. It showed a significant statistical difference between the study and control groups concerning practice scores in the post-test and follow-up (p < 0.05).

Figure (1): Showed the correlation between the total score of geriatric patients' knowledge and practice about stroke prevention. It was observed that there was a positive correlation between geriatric patients' knowledge score and practice score about stroke prevention during pre-test and follow-up.

Discussion

Stroke is a significant health concern among the elderly population, and its incidence tends to increase with age. According to recent research, stroke is the second-leading cause of mortality and disability all over the world, and the majority of stroke survivors are over the age of 65. Early detection and treatment of stroke are vital to minimizing the risk of long-term disability and mortality. Therefore, it is essential to implement preventive measures and raise awareness among the elderly population and their caregivers **(Krishnamurthi et al., 2021).**

This study showed that more than two-thirds of the study group and more than two-thirds of the control group were aged 60–70. Similar findings were stated by **Elsehry et al., (2019)** in Egypt, who reported that more than two-thirds of participants were aged 60–70. This research showed that more than two-fifths of the study group and more than two-thirds of the control

group were male. This is because men are at high risk for stress and chronic diseases. This disagreed with the other study by **Chimberengwa & Naidoo (2019)** in Zimbabwe, which observed that more than two-thirds of patients were female.

Hypertension was the highest rate of health problems in this study more than three quarters of study group and the majority of control group had hypertension. This because that around the half of study group and more than two thirds of control group were male and expose to more stress. This study is agree with **Bedier (2018)** in Egypt, who found that the majority of the sample had hypertension. Also, these outcomes agreed with **Punnapurath et al. (2021)** in India, who showed that more than three-fifths of the sample had hypertension.

This result might be because there is no source of adequate knowledge about stroke, its definition, types, signs, risk factors, complications, treatment, and prevention form doctors and nurses because they don't have the time and lack the staff to explain about stroke. As a result of a lack of knowledge, there is a widespread prevalence of stroke risk factors among geriatric patients'.

This research agreed with another study done by **Beider et al. (2018)** in Egypt that found that there was a statistically significant improvement in knowledge scores among geriatric participants during the pre-test, post-test, and follow-up.

This research agreed with another study done by **Elsehry et al. (2019)** in Egypt that found that the whole sample had no knowledge about stroke in the pre-program, but in the post-test, the majority of them had a good knowledge score about stroke.

The outcomes of the current study also demonstrated that there was a statistically significant improvement in the knowledge score of geriatric participants between study and control groups during the pre-test, post-test, and follow-up, where the mean score of knowledge score increased form 25.58 ± 9.92 in pre-test to 47.91 ± 7.14 immediately post-test and 37.56 ± 4.62 in three months follow-up in the study group, while the mean knowledge score increased form 24.31 ± 8.06 in pre-test to 25.58 ± 6.05 immediately post-test and 26.11 ± 8.41in three months follow-up in the control group with a statistically significant difference between both groups.

The outcomes of the current research also demonstrated that after three months of the program, there was a slight decline in the total knowledge score but it was still higher than before the implementation of the program. This can reflect the effect of the program; the ability to retain the information declines with age as they become older adults. This study agreed with another study done by **Beider et al. (2018)** in Egypt, who found that there was a slight

decline in the total knowledge score but that it was still higher than before the implementation of the program.

Regrading the total practice score of the participants, the current study also presented that 7.1 percent of the participants in the study group had a good practice score about stroke in the pre-test, but immediately post-test, more than two-thirds of them had a good practice score, and more than half of them had a good practice score after three months follow-up. This can be related to the efficiency of the educational program in raising the awareness of participants about stroke. This study disagreed with research done by **Arisegi et al. (2018)** in Nigeria, which showed a decline in the practice of stroke prevention among them.

The current research also demonstrated that there was a statistically significant improvement in the practice score of participants between the study and control groups during the pre-test, post-test, and three-month follow-up, where 8.2% of the participants in the study group had a good practice score about stroke in the pre-test, more than two thirds of sample had a good practice score about stroke immediately post-test, and more than half of sample had a good practice score about stroke after three months of follow-up with a significant statistical difference between both groups.

This research agreed with another study done by **Elsehry et al. (2019)** in Egypt that found that the majority of the patients had poor practice in the pre-test, while in the post-test, the total sample had good practice either immediately or three months follow-up. The current study clarified the positive relationship between the total score of geriatric patients' knowledge and practice about stroke prevention. The outcomes of the current study showed that there was a significant statistical difference between geriatric patients' knowledge and practice about stroke prevention during the pre-test and three-month follow-up (P = 0.000). This research agreed with another study done by **Elsehry et al. (2019)** in Egypt that found that their practice was positively correlated with their knowledge during the three months follow-up.

Conclusion:
There was a significant statistical difference between pre-test and follow-up in knowledge score and a significant statistical difference between pre-test and follow-up in practice score. There was a positive correlation between the total score of knowledge and the total score of practices with statistical significance.

Recommendations:
In light of the current study findings, the following recommendations are suggested:

1. Educational programs should be developed for geriatric patients regarding stroke prevention.
2. Periodic health education programs should be applied to increase awareness and involve stroke-risky individuals in program design and monitoring.
3. There is a critical need for information to be available at the undergraduate and postgraduate levels to physicians, physician assistants, nurse practitioners, and nurses in general about the stroke prevention needs of geriatric patients.
4. Further study is recommended on a large sample and in different hospital settings in order to generalize the result.

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