

Cerebrovascular Stroke Risk Factors and level of Knowledge among Community- dwelling Hypertensive Elderly

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Abstract

Background: Cerebrovascular stroke is the leading cause of preventable death and disability worldwide. Older people are particularly prone to stroke and post-stroke complications due to delayed treatment and lack of knowledge about the disease. **Aim:** to assess cerebrovascular stroke risk factors and level of knowledge among community-dwelling hypertensive elderly. **Research questions:** 1. What is the level of knowledge about cerebrovascular stroke among community-dwelling hypertensive elderly?. 2- What are the risk factors of cerebrovascular stroke among community- dwelling hypertensive elderly?.3. What are the categories of cerebrovascular stroke risk among community- dwelling hypertensive elderly?.4. What is the relationship between cerebrovascular stroke knowledge level and demographic characteristics of community- dwelling hypertensive elderly?. **Design:** descriptive correlational research design was utilized. **Setting:** four family health centers in Cairo governorate. **Sample:** A purposive sample of 200 community-dwelling hypertensive elderly. **Tools:** 1- A CVS elderly knowledge questionnaire 2- CVS risk assessment scale. 3- Mercury sphygmomanometer. **Results:** 51% of the elderly showed an unsatisfactory level of CVS knowledge, while 23% of the elderly had a history of previous stroke; moreover, 40% are at high risk of developing CVS. **Conclusion:** Based on the results, level of knowledge among studied hypertensive elderly was unsatisfactory. Nearly half of elderly were at high risk for cerebrovascular stroke, and more than half of the elderly were borderline. A statistically significant positive correlation ($p \leq 0.001$) was found between the demographic data of the elderly and general stroke knowledge. **Recommendation:** Raise elderly stroke knowledge through a community-wide campaign; implement interventional studies for nursing management of CVS.

Key words: elderly, stroke risk factors, knowledge.

Introduction

Cerebrovascular stroke (CVS) is described through World Health Organization (WHO) as a “neurological deficit of cerebrovascular origin that persists or is interrupted by loss of life within 24 hours” (Luker et al 2017). CVS is a crippling medical emergency condition that could result in permanent neurological damage, disability, and loss of life, if not diagnosed and treated immediately. It is not only the second leading cause of death for humans above the age of 60 worldwide. Additionally it is the third most common cause of disability with a global incidence of approximately sixteen million patients annually, with a mortality rate up to six million (Kaddumukasa et al., 2017, Ketchner et al., 2011 and American Heart Association, 2015).

World Health Organization (WHO) additionally defined CVS as “a fast growing medical condition of focal (or global)

disturbance of cerebral function, with signs and symptoms lasting 24 hours or longer, or death. Recently, an up to date new broader CVS definition by the American Heart Association/American Stroke Association that consists of any evidence of permanent brain, spinal cord, or retinal death attributed to a vascular etiology primarily based totally on pathological or imaging evidence without or with the presence of scientific signs, (Sacco et al., 2013).

One quarter of all CVS is fatal and when not deadly, it is often disabling (Thom, Haase & Rosamond, 2011). Stroke might be hemorrhagic or ischemic. More than 3 quarters of strokes are ischemic (about 80% utilized by interruption of the blood deliver to the brain), and the ultimate 20% are hemorrhagic (because of rupture of a blood vessel) (American Heart Association/American Stroke Association, 2013). Risk factors for stroke may be categorized as modifiable and non-modifiable.

Unhealthy life-style behavior which includes smoking, excessive cholesterol in diet, alcohol consumption, obese and bodily inactivity. Hypertension, diabetes mellitus, hyperlipidemia, cardiovascular illnesses are amongst a number of the modifiable chance elements, at the same time as own circle of relatives records of stroke, Age and gender are non-modifiable chance elements (**Boehme et al., 2017**).

Egyptian elderly are specifically susceptible to CVS because of higher rates of risk factors together with smoking, high blood pressure and diabetes mellitus. For example, **World Federation of Diabetes (2012)** stated high death rate among Egyptians because of diabetes and its complications. As well, **Murad, (2012)** indicated that Egypt is ranked as the thirteenth on the world level in the prevalence of diabetes. According to **Central Agency for Public Mobilization and Statistics in Egypt (CAPMAS, 2017)**, 17% of Egyptians (9.4 million) are smokers. The Incidence rate of stroke in Egypt is 963/a hundred 000 individuals (**Abd-Allah et al., 2014**).

An evidence based meta-analysis of 18 Egyptian researches carried out by **Abd el-ghany, (2011)** mentioned that the occurrence of CVS was 2.1 per 1000; moreover, the prevalence rate was 5.4 per 1000. It was additionally observed that, risk factors among elderly in Egypt were age (50-70 years), hypertension (67.1%), dyslipidemia (57.9%), cardiac diseases (46.2%). Post stroke complications among older adults survivors include; neurological deficits, communication, vision, cognition, ambulation, musculoskeletal dysfunction, altered nutrition, altered skin integrity, perception, sensation, bowel and bladder control, and limitation of activity of daily living which restrict their participation in social events and other professional activities. Lack of CVS knowledge could contribute to delay in early treatment decisions, (**Mcbride, White, Sourial & Mayon, 2015**).

Significance of the Study

According to the Central Agency for Public Mobilization and Statistics (CAPMAS), Egypt's aged population is anticipated to be 6 million and is expected to grow to 12%

through 2030 (**CAPMAS, 2017**). Despite the shortage of national registry of cerebrovascular disorders, WHO estimates that new cases of cerebrovascular disorders are among 150,000 and 210,000 annually, accounting for about 85% of deaths. Mortality from stroke took place in low- and middle-income countries including Egypt, (**Farraga, Orabyb & Ghalic, 2018**).

Lack of elderly knowledge concerning stroke signs and symptoms may lead to delayed reaction and accelerated complications. Given that older adult are the most susceptible demographic group at risk for CVS, it is especially vital to recognize those risks and factors associated with stroke information among elderly. Identification and understanding of causes, warning signs, and risk factors important in nursing care plans preventive techniques which includes stroke education. So the aim of this study is to assess cerebrovascular stroke knowledge and risk factors among community-dwelling hypertensive elderly (**Salameh & Rachidi , 2016**).

Better knowledge of stroke risk factors, warning signs and nursing management allows older patients and their families to seek treatment and call emergency services faster in real life situations. Community and gerontological nurses play an important role at three levels of prevention. From promotion to recovery, nurses provide patient information and resources. This research is an important step in planning, implementation and evaluation of community education programs to prevent cerebrovascular stroke and related problems in the elderly (Allender et al., 2013). This study aim to help community and gerontological nurses to assess stroke risk factors and knowledge level among elderly, apply primary prevention strategies, plan appropriate nursing management programs, and evaluate nursing practices in terms of quality of family education and nursing care for the elderly.

Aim of the Study:

Assess cerebrovascular stroke risk factors and level of knowledge among community-dwelling hypertensive elderly.

Research questions:

- Q 1-** What is the level of knowledge about cerebrovascular stroke among community-dwelling hypertensive elderly?
- Q 2-** What are the risk factors of cerebrovascular stroke among community-dwelling hypertensive elderly?
- Q 3-** What are the categories of cerebrovascular stroke risk among community-dwelling hypertensive elderly?
- Q 4-** What is the relationship between cerebrovascular stroke knowledge level and demographic characteristics of community-dwelling hypertensive elderly?

Subjects and Methods

Research Design: A descriptive co-relational design was utilized to fulfill the aim of this study. It provides a snapshot of the current situation and discovers relationships among variables and allow the prediction of future events from present knowledge (William, James and Kanika, 2015).

Setting: The four family urban governmental health centers in Cairo were randomly selected from a total of eight family health centers. The selected centers are: Abo El Soud, Amr Ben Elaas, Elkhabiri and El Manial. Family health services is provided through outpatient clinics such as vaccination clinics, dental clinics, obstetrics and gynecology, emergency clinics (first aid of minor emergencies, various injections, dressings, etc.), family planning clinics, and family outpatient clinics: medical clinics, treatment, safety programs (infection control, employee health and safety), medical services (pharmacy, clinical laboratory and x-ray room), paramedical services (laundry, kitchen) and family file cabinets.

Sample: The sampling frame was a list of urban governmental family health centers. After random selection of centers, four family medicine clinics were randomly selected (4 out of 8) from every center. Sample size was then calculated using the free online sample size calculator website to be 200 community-dwelling hypertensive elderly who were purposively selected from the previously

mentioned centers based on the following criteria:

Inclusion criteria:

1. Age 60 years old or over.
2. Male and females' older people.
3. Diagnosed as hypertensive for more than 1 year.
4. Able to communicate and answer the questions.

Exclusion criteria: Elderly complaining of neurocognitive disorders that hinders communication such as cerebrovascular stroke dementia.

Tools of data collection:

- 1- Cerebrovascular stroke elderly knowledge structured interviewing questionnaire** that was developed by the researchers based on National Stroke Association (2012). It included 3 sections: **First section** contained demographic and medical history data including 25 questions such as age, marital status, and educational level, occupational and medical history. **Section 2:** 21 questions about cerebrovascular disease risk factors and knowledge of modifiable stroke risk factors such as smoking status, blood pressure, serum lipids, waist circumference and BMI, diet and physical activity levels, and uncontrollable risk factors such as age and gender. Family medical history, related conditions such as familial hypercholesterolemia, signs of atrial fibrillation). Researchers also asked older adults about sources of information about stroke. **Section 3:** Contains 7 knowledge questions about cerebrovascular disease prevention and response during stroke.

Scoring system: Scoring system of CVS knowledge questionnaire (for second and third section) was calculated by giving 1 score for "Yes or correct answers" and zero for "No or wrong answers" then a total score was calculated. The scores of the items were summed-up and the total divided by the number of the items and multiplied by 100, giving a mean percent score, then mean and standard deviation were computed. The total

scores values was then calculated and the accepted level of knowledge was estimated on a continuum to be either good (for values more than 80%) satisfactory (for values ranged from 60-80 %) or unsatisfactory (for values less than 60%).

2- CVS risk assessment scale: it is a **standardized** Stroke Risk Assessment Summary Map Based on the 2012 American Stroke Association. It consists of 8 risk factors (blood pressure, cholesterol, diabetes, smoking, atrial fibrillation, weight, exercise, family history).

Scoring system: Each risk factor is set on a continuum ranges from high risk (eg blood pressure >140/90 or unknown), borderline risk/caution (eg blood pressure, 120-139/80-89), or low risk (eg blood pressure >120/80). The risk to the elderly is 1 point. Then, score a score under each box to classify them as high risk (≥ 3), caution/cutoff (4-6), and low risk (6-8).

3- Mercury sphygmomanometer.

Scoring system: according to the American College of Cardiology/American Heart Association Guideline for the Prevention, Detection, Evaluation, and Management of High Blood Pressure in Adults (Whelton, 2017), Normal range was systolic less than 120 mm Hg and diastolic less than 80 mm Hg. Blood pressure is considered elevated if systolic is 120–129 mm Hg and diastolic is less than 80 mm Hg. High blood pressure (hypertension) is a reading of systolic that is 130 mm Hg or higher and diastolic that is 80 mm Hg or higher.

Validity and reliability: For the developed research tools, the research tools were delivered to a group of 3 experts (1 nurse and 2 gerontology professors) to rate the relevance of the factors on a 4-point scale (1 _ not related to 4 _ very related). The researchers then calculate inter- professional agreement index and a formal content reliability index of 95. The reliability of the developed CVS knowledge questionnaire was an alpha coefficient of 0.7. The reliability of the mercury sphygmomanometer was achieved by using

the same instrument and calibrating it before each use.

Pilot Study: This was done with participants (10%) to test the clarity of questions and to judge the validity of the study. Pilot samples were excluded from study samples.

Procedure: official permissions were obtained from the Director of the centers to conduct the research. Data were collected over a three-month period from March 2018 to June 2018. To complete the study tool, the elderly were interviewed in a private location in the centers from 10 am to 1 pm 2 days a week. After fully explaining the purpose of the study to the elderly, they consented to participate in the study. The researchers first measured each elderly person's blood pressure and then began collecting data, which took 30 minutes. Blood pressure was measured using a mercury sphygmomanometer and calibrated before each use.

Protection of ethical and human rights: The researchers explained the purpose and nature of the study. Older people were told they had the right to withdraw from the study at any time without negative consequences. Informed consent was obtained from all eligible participants who agreed to participate in the study. Data confidentiality and patient confidentiality and anonymity are ensured. Code numbers were created and stored by researchers.

Statistical data analysis: The collected data was coded and tabulated using a personal computer, and SPSS (Statistical Package for Social Sciences) version 16 was used and descriptive statistics and data from Nandhini & Rangarjan, 2013 were used. Statistical significance was considered at $p\text{-value} \leq 0.05$.

Results and Data Analysis

Table 1 shows that 45.5% of elderly age ranged from 70 to less than 80 years old with $\bar{x} \pm SD$ 71.34 \pm 7.45, moreover, 43.5% of elderly held professional jobs while, 20.5% held a technical job, whereas, 26% of elderly were housewives.

Figure (1) shows that, 51.5% of elderly were females, while, 59% of them were

widow/widowed, furthermore, and 61.5% had bachelor's degree.

Table (2) reveals that elderly had medical history as follow: diabetes mellitus (50.5%), cardiac diseases (19.5%), hyperlipidemia (22.5%), previous old stroke (23%), family history of stroke (15.5%), It is clear that only 17% of elderly are currently smokers, , whereas, (27%) of them used to walk daily, only 11% of them overused salt in food, and (18%) of them practiced physical exercise.

Figures (2) and (3) reveal that, current blood pressure reading was elevated among 40% of elderly and high blood pressure /hypertension among 22% of elderly. Categories of stroke risk assessment score revealed that 40% of elderly were at high risk for developing cerebrovascular stroke, while, 56% of elderly were borderline/ caution.

Figure (4) illustrates that, elderly gained their information from their families (45%), friends (27%) or suffering from previous old stroke (23%) or from their work in medical field (5%).

Table (3) reveals that alcohol consumption, smoking, age over 60, and hypertension were among the risk factors CVs risk factors as reported by 74.5%, 72.5%, 72.5%, 71.5% of elderly.

Table (4) shows that 77% of elderly reported that difficulty speaking or heavy tongue as CVS symptoms followed by sudden inability or difficulty with speech or Inability

to understand spoken speech (65%), weakness and numbness of the arm (63.5%).

Table (5) shows that, 71.5%, 61%, 57.5% and 67.5% of elderly respectively mentioned that smoking cessation, losing body weight, daily walks, and abstaining alcohol could reduce the risk of a stroke. Regarding elderly knowledge about immediate response during stroke attack, reveals that 80% of elderly reported that calling ambulance, and 72% of them were oriented that they should go to physician if they experience CVS symptoms.

Figure 5 illustrates that 51% of elderly have unsatisfactory level of knowledge regarding stroke while, 21% have satisfactory level of knowledge, moreover, 29% of elderly have good level of knowledge.

Table (6) concludes that the total mean (mean %) among study participants about CVS is 40.96%.

Table (7) concludes that there were highly significant statistical positive correlations ($p \leq 0.001$) between the demographic data and elderly total knowledge about CVS warning signs.

Table (8) concludes that there were highly significant statistical positive correlations ($p \leq 0.001$) between the demographic data and elderly total risk factors of stroke.

Table (9) concludes that there were highly significant statistical positive correlations ($p \leq 0.001$) between the different items of elderly knowledge about CVS.

Table (1): Frequency distribution of elderly age categories and occupational history (n=200).

Age categories	No.	%
60-< 70 years	76	38
70-< 80 years	91	45.5
80-< 90 years	30	15
≥ 90 years	3	1.5
$\bar{x} \pm SD$	71.34 ± 7.45	
Occupational history		
Professional	87	43.5
Technical	41	20.5
Managerial	20	10
Housewife	52	26

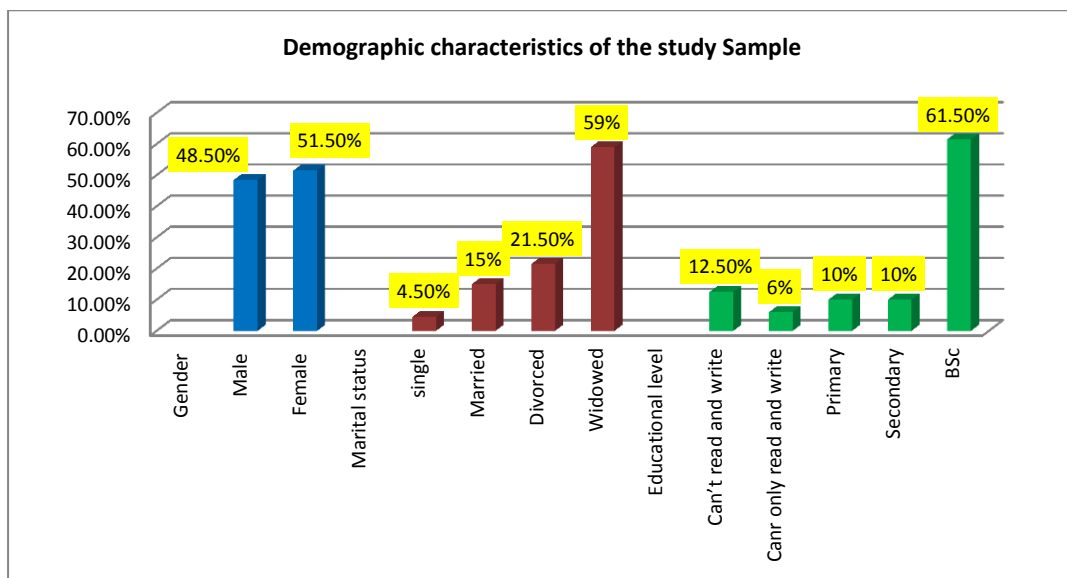


Figure (1): Frequency distribution of elderly demographic data (n=200).

Table (2): Frequency distribution of elderly medical history and lifestyle habits (n=200).

Medical history	Yes		No	
	No.	%	No.	%
Diabetes mellitus	101	50.5	99	49.5
Cardiac diseases	39	19.5	161	80.5
Hyperlipidemia	45	22.5	155	77.5
Previous old stroke	46	23	154	77
Family history of stroke	31	15.5	169	84.5
Overweight	77	38.5	123	61.5
Atrial fibrillation	34	17	166	83
Lifestyle habits				
Cigarette smoking (currently)	34	17	166	83
Former smoker	73	36.5	127	63.5
Daily walking	54	27	146	73
Overuse of salt in food	22	11	178	89
Physical exercise	36	18	164	82

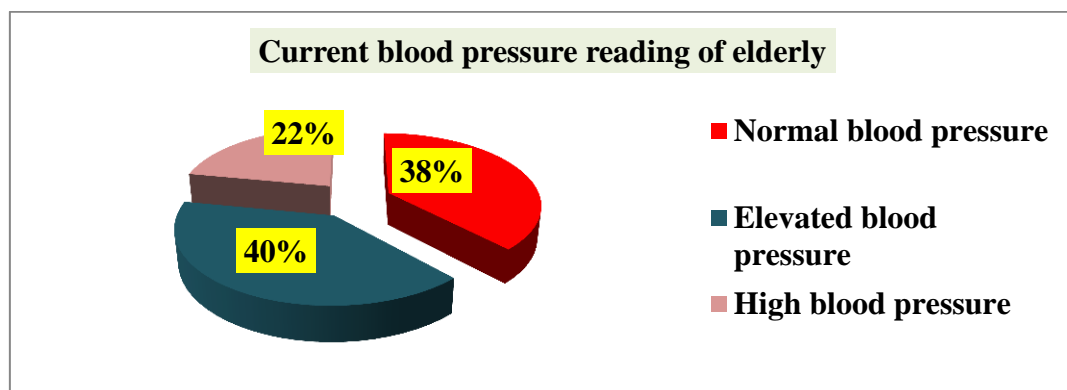


Figure (2): Frequency distribution of Current blood pressure reading of elderly client (n=200).

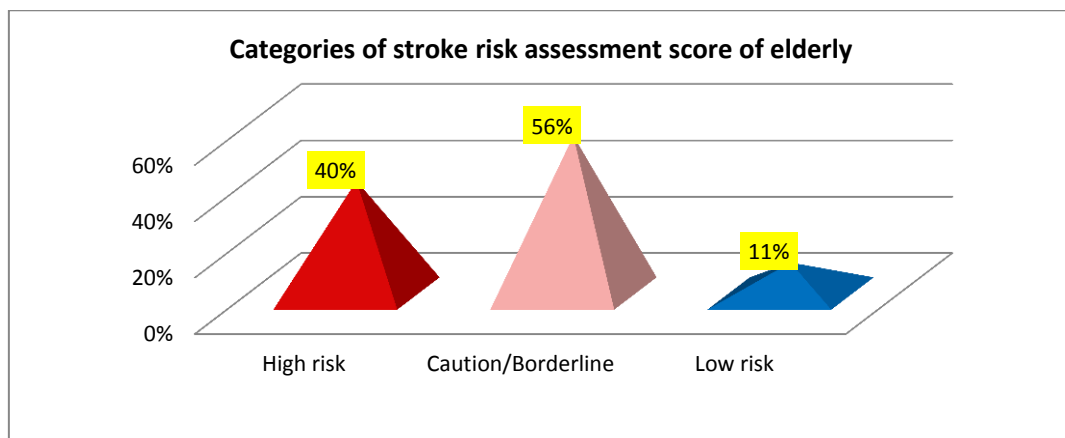


Figure (3): Categories of stroke risk assessment score of elderly clients (n=200).

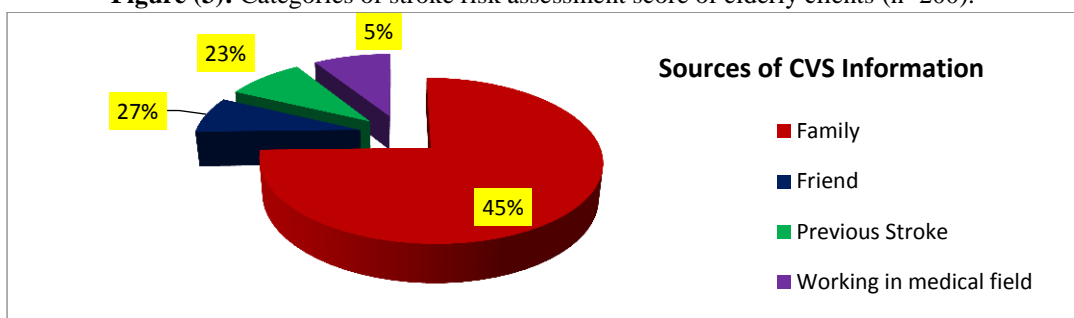


Figure (4): Frequency distribution of elderly source of information about CVS (n=200).

Table (3): Frequency distribution of elderly knowledge about stroke risk factors (n=200).

Item	Incorrect		Correct	
	No.	%	No.	%
Age over 60 years old	55	27.5	145	72.5
Gender (men are more vulnerable than women)	125	62.5	75	37.5
Severe narrowing of the carotid artery	140	70	60	30
Previous transient stroke	91	45.5	109	54.5
Hypertension	57	28.5	143	71.5
Diabetes mellitus	129	64.5	71	35.5
Smoking	55	27.5	145	72.5
Alcohol consumption	51	25.5	149	74.5
Drug abuse	61	30.5	139	69.5
Obesity	77	38.5	123	61.5
Hyperlipidemia	67	33.5	133	66.5
Heart disease	79	39.5	121	60.5
Anxiety and stress	87	43.5	113	56.5
Genetic factors	103	51.5	97	48.5
Sedentary life	89	44.5	111	55.5
Decongested drugs	124	62	76	38
Stroke recurrence	83	41.5	117	58.5
Transient strokes recurrence occurs with lesser symptoms	91	45.5	109	54.5
Small stroke, symptoms appear for a short period and disappear within 5 minutes	126	63	74	37
If a person experiences these secondary clots, there is a possibility of a major stroke within 48 hours	118	59	82	41

Table (4): Frequency distribution of elderly knowledge about stroke warning signs (n=200).

Item	Incorrect		Correct	
	No.	%	No.	%
Stroke symptoms start suddenly within seconds or minutes	104	52	96	48
Stroke symptoms begin gradually over days to weeks	150	75	50	25
Sudden weakness of the facial muscles	105	52.5	95	47.5
The person may not be able to smile	95	47.5	105	52.5
The level of the mouth or eyes of the stroke sufferer may drop	108	54	92	46
Sudden severe headache of unknown cause	79	39.5	121	60.5
Difficulty speaking or heavy tongue	46	23	154	77
Being unable to speak at all even though he appears to be conscious	77	38.5	123	61.5
Sudden inability or difficulty with speech or Inability to understand spoken speech	70	35	130	65
Speech may be slurred or distorted	60	30	140	70
The occurrence of chest pain for a person	135	67.5	65	32.5
Inability to raise and hold one or both arms	83	41.5	117	58.5
Difficulty swallowing	135	67.5	65	32.5
Weakness or numbness in the arm	73	36.5	127	63.5
Paralysis of a part of the body	76	38	124	62
Dizziness or sudden unsteadiness	89	44.5	111	55.5
Blindfolded/double vision	107	53.5	93	46.5
Sudden paralysis of the body	83	41.5	117	58.5
Sudden loss of vision in one or both eyes	123	61.5	77	38.5
Tingling face or arm	87	43.5	113	56.5
Sudden confusion/Loss of consciousness	73	36.5	127	63.5

Table (5): Frequency distribution of elderly knowledge about stroke prevention and immediate response (n=200).

Knowledge about stroke prevention and response	Incorrect		Correct	
	No.	%	No.	%
To reduce the risk of a stroke				
Smoking cessation	57	28.5	143	71.5
Lose weight	78	39	122	61
Daily walk	85	42.5	115	57.5
Abstaining from alcohol	65	32.5	135	67.5
Action during stroke attack?				
Give the patient sugar water	88	44	53	26.5
Call an ambulance	40	20	160	80
Go to the doctor	56	28	144	72

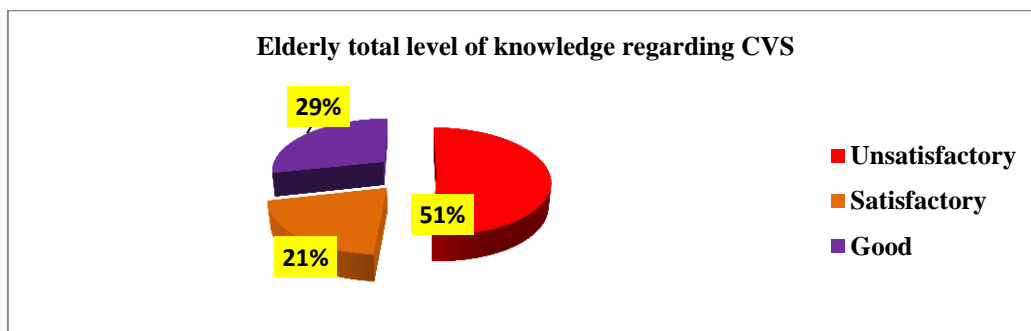


Figure (5): Elderly total level of knowledge regarding CVS (n=200)

Table (6): Descriptive statistics of elderly knowledge scores about stroke (n=200).

Knowledge items	Min	Max	Mean	SD	Mean%
General knowledge about stroke	0	3	1.42	1.25	47.33
knowledge about signs and symptoms of stroke	0	25	13.52	7.22	54.08
knowledge about warning signs of stroke	0	44	14.55	7.36	33.07
Knowledge about prevention and response	0	3	1.33	1.26	42.23
Total knowledge	0	72	29.49	15.83	40.96

**Correlation is highly significant at the 0.0001 level (2-tailed)

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

Table (7): Relation between elderly demographic data and total knowledge about stroke warning signs (n=200).

Demographic data	Categories	Total knowledge about CVS warning signs		Test	P
		Mean	SD		
Age	60-< 70 years	17.11	5.72	6.354	.000**
	70-< 80 years	13.57	8.53		
	80-< 90 years	11.70	4.94		
	≥ 90 years	8.00	7.55		
Gender	Male	15.93	8.52	2.58	.002**
	Female	13.25	5.83		
Marital status	Single	18.78	1.20	5.177	.002**
	Married	14.60	6.96		
	Divorced	17.56	5.35		
	Widowed	13.12	7.94		
Educational level	Can't read and write	11.45	4.32	1.134	.342
	Can read and write	14.05	5.27		
	Primary	14.83	7.56		
	Secondary	15.58	5.23		
	BSc	15.56	9.96		
Occupational history	Teacher	16.82	7.38	4.350	.000**
	Faculty member	10.45	8.99		
	Supervisor	18.00	0.00		
	Translator	15.94	7.00		
	Consultant	8.10	6.30		
	House wife	12.36	5.20		
	Trader	16.00	4.64		
	Free jobs	13.00	.		
	Engineer	14.40	5.50		
	Employee	16.20	5.44		
	Farmer	29.00	17.49		
	Journalist	4.00	0.00		
	Policeman	18.00	.		
	Driver	12.00	.		

**Correlation is highly significant at the 0.0001 level (2-tailed)

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

Table (8): Relation between demographic data and elderly total knowledge about stroke risk factors (n=200).

Demographic data	Categories	Total knowledge		Test	P
		Mean	SD		
Age	60-< 70 years	34.92	11.77	7.305	.000**
	70-< 80 years	26.93	15.48		
	80-< 90 years	24.70	10.90		
	≥ 90 years	16.67	16.17		
Gender	Male	31.65	15.34	2.11	.03*
	Female	27.44	12.72		
Marital status	single	36.78	5.91	4.883	.003**
	Married	29.10	14.38		
	Divorced	35.37	10.78		
	Widowed	26.87	14.91		
Educational level	Can't read and write	24.65	9.78	.931	.447
	Not educated	27.10	11.30		
	Primary	30.28	14.79		
	Secondary	32.08	13.82		
	BSc	30.04	16.05		

**Correlation is highly significant at the 0.0001 level (2-tailed)

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

Table (9): Correlation between knowledge items about stroke (n=200).

Items	General knowledge about stroke		knowledge about immediate response during stroke		knowledge about warning signs of stroke	
	r	p	r	p	r	p
knowledge about immediate response during stroke	.38	.00*				
knowledge about warning signs of stroke	.43	.00*	.74	.00*		
General knowledge about stroke	.503	.00*	.93	.00*	.93	.00*

**Correlation is highly significant at the 0.0001 level (2-tailed)

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

Discussion

Stroke is one of the world's leading causes of severe disability and death worldwide. It is not known whether geriatric patients who are at the highest risk of stroke have sufficient knowledge about CVS or not. Previous researches have shown that failure to recognize the warning signs and symptoms of stroke cause delay in seeking medical treatment, complicate the condition, limit interventions, and negatively impacts the potential outcome of stroke. Looking at the demographic characteristics of the elderly in this study, almost half of the elderly were between the ages of 70 to less than 80, of whom about half were women, and nearly two-thirds of them were widows/widowers. Results of this study

are similar to an Egyptian study of cerebrovascular stroke recurrence in critically ill patients at a specific university hospital in Egypt conducted by Yousef (2013), and the majority of patients hospitalized for severe stroke were at age of 75 or older. From researchers' point of view, the correlated risk factors for stroke among studied elderly in this study include, demographic characteristics (e.g. age), and previous medical and occupational factors requiring urgent nursing intervention for stroke prevention and treatment.

In terms of **older people's medical history and risk factors for CVS**, nearly half of older people have diabetes mellitus, and almost a quarter of them have heart disease, hyperlipidemia, and previous stroke. Less than

one-fifth of the elderly have a family history of stroke. Regarding **lifestyle** of elderly surveyed, less than two-quarters of the elderly are currently smoking, more than one-third of the former smokers, and about one-quarter and about four of the elderly walk every day. It turned out to be one-third. Of these, quarter of people overuse salt in their foods, nearly a quarter exercise, more than one-third of older people are at high risk of stroke, more than half are at borderline risk of developing CVS. This is consistent with a similar study by Eun, Seon, and Ae Lee (2011) who investigated Knowledge and risk factors of stroke and heart attack in the elderly in rural Korea. Almost three-quarters of the participants had hypertension and almost one-third had diabetes, but almost half of the participants had more than one cerebrovascular disease and cardiovascular risk factors. A step-by-step multiple regression analysis of this Korean study showed that old age, low-level education, and low income were determinants of stroke knowledge deficiency. Current study also shows that, about one-third of the elderly suffered from previous ischemic stroke. This result is consistent with Morte & Guadagn (2012), who investigated stroke-related risk factors and reported the same.

A similar study by Yousef (2013) has documented uncontrollable risk factors (age, male gender, marriage), Lifestyle risk factors (smoking, obesity, low income); Chronic medical disorders (old CVS, hypertension, diabetes mellitus, ischemic heart disease, myocardial infarction, heart failure); hyperlipidemia were the most common risks contributed to recurrent cerebrovascular attacks of varying degrees of severity. From the perspective of current researchers, the elderly examined in the current study have many controllable and uncontrollable stroke risk factors. Changeable lifestyle risk factors for the elderly living in the community are often ignored, but this should be a top priority for educational CVS prevention. Current researchers also recommend regular blood pressure screening initiatives and a national assessment of stroke risk factors using the simple screening scale used in current studies. Follow-up interventions are also highly

recommended for older people with senile stroke.

Regarding the **first research question** about elderly's knowledge of stroke, the current study found that the level of knowledge among the elderly on stroke was low. This is consistent with Ahmed et al, 2014 study who reported CVS risk factors among the Saudi Arabian population such as smoking, being over 60, high blood pressure, substance abuse. Lack of knowledge about stroke was also found among that study. Similarly, Hickey et al. In 2009, also reported lack of knowledge of the elderly surveyed. When asked to identify risk factors for stroke from the list provided, with the only exception of hypertension, less than half of all samples have established risk factors such as smoking and hypercholesterolemia. Current study results are inconsistent with Mina's 2012 study of stroke warning signs and knowledge, but the majority of study participants are very familiar with stroke warning symptoms (> 95%), and nearly half of Mina's older people have good stroke knowledge. These results are also inconsistent with Das, 2013, where study participants reported that diabetes was a major risk factor for CVS.

According to elderly general knowledge of CVS; more than one third of elderly were aware with CVS definition, while nearly one third of them were aware with individuals who are at risk to CVS, whereas, very little numbers of them were aware with symptoms of stroke. This result was supported by a study done by Saengsuwan, Suangpho, and Tiamkao (2017) who studied knowledge of stroke risk factors and warning signs in patients with recurrent stroke among 140 Patients with recurrent stroke or recurrent TIA who were recruited from both inpatient and outpatient units in Srinagarind Hospital and Khon Kaen Hospital, The participant reported similar results. As regards, elderly knowledge about stroke warning signs, around two thirds elderly reported difficulty speaking or heavy tongue as CVS symptoms followed by sudden inability or difficulty with speech or inability to understand spoken speech), weakness and numbness of the arm in the current study. Similarly, Saad (2017) reported that stroke knowledge of caregivers of stroke patients in

Pakistan: citing speech impairment as the first clinical symptom of stroke following hemiplegia. A similar study on knowledge of stroke risk factors and warning signs in Thai recurrent stroke or recurrent transient ischemic attacks by Saengsuwan, Suangpho, and Tiamkao (2017) in Thailand by Saengsuwan, Suangpho, and Tiamkao (2017) found that the perceived warning signs in 140 elderly patients had sudden unilateral weakness and reported that it was (61.4%), sudden speech impairment (25.7%) and sudden gait disturbance, loss of balance or vertigo (21.4%).

In terms of older people's knowledge about stroke prevention and immediate response, about three-quarters of older adults said quitting smoking, losing weight, walking daily and avoiding drinking alcohol could reduce their stroke risk. In terms of older adults' knowledge of immediate responses to stroke, older adults reported that they should call an ambulance if symptoms of stroke occur. This finding is consistent with an Irish study by Deirdre (2010), who said that participants would call an ambulance if they had a stroke. Overall, there was a significant knowledge gap, with the lowest levels observed among those aged 65 and over. From clinical observation of current study researchers, a medical education program for the elderly that can respond quickly and immediately to stroke disease is very important in preventing complications after stroke.

Regarding the **second question** of the study, it relates to stroke risk among older people living in the community. In this regard, categorical stroke risk estimates show that less than half of the elderly are at high risk for cerebrovascular stroke, while more than half of the elderly are borderline. Current blood pressure levels were also increased in more than two-thirds of the elderly. A higher incidence of ischemic than hemorrhagic stroke has been reported by Youssef, 2013, with hypertension and diabetes being the most common risk factors among participants. From the point of view of researchers, this high proportion of risk is associated with the presence of many risk factors. Modifiable risk factors such as smoking, as well as non-modifiable risk factors such as family history, comorbidities of high blood pressure,

hyperlipidemia, and diabetes were studied. These findings are surprising and urgent campaigns are needed to raise awareness of stroke prevention and treatment among older Egyptians.

Regarding the relationship between overall risk assessment and geriatric demographics, the results of this study demonstrate a significant correlation between age, gender, marital status, and previous work. This is the case for Hickey (2009) and Alakil (2014), who reported similar results. Regarding the relationship between overall CVS knowledge scores and geriatric demographics, the results of this study show that there is a significant relationship between age, gender, marital status, and previous work. On the other hand, no significant relationship was found between educational attainment and overall knowledge scores, which is inconsistent with Duque's (2015) study that educational attainment is a better predictor of CVS knowledge. Similarly, Saengsuwan, Suangpho, and Tiamkao (2017) reported low knowledge scores in a cross-sector survey of 140 elderly patients with recurrent stroke or recurrent TIA admitted to Srinagarind Hospital and Khon Kaen Hospital in Thailand. From the researcher's point of view, the findings of the present study may be related to the presence of many modifiable risk factors and non-modifiable risk factors in the elderly in the current study.

Strengths and of limitations the study:

The strength of this study is that it can elucidate knowledge about risk factors for cerebrovascular stroke elderly with hypertensions. In addition, data quality management has been widely applied. Limitations included a memory bias for questions about knowledge. Yes or no answers also did not examine why patients had specific views about stroke. Second, because the study only included community-based older adults, it could not conclusively address knowledge of stroke risk factors and warning signs in large populations.

Conclusion

It can be concluded that more than half of the older adults had an unsatisfactory level of knowledge about cardiovascular disease, which

could lead to higher complications and a slower response to stroke. Moreover, less than half of the elderly were at high risk for cerebrovascular stroke, and more than half of the elderly were borderline. A statistically significant positive correlation ($p \leq 0.001$) was found between the demographic data of the elderly and general stroke knowledge.

Recommendation:

1. Raise stroke awareness among older people through community-wide campaigns.
2. Conducting interventional studies for nursing care of CVS.
3. Replicating the study to a larger sample for greater generalization.

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