

ORIGINAL ARTICLE

Risk Factors and Stroke Symptoms Knowledge among Hypertension, Diabetes Mellitus, and Congestive Heart Failure Patients: A Descriptive Quantitative Study

Maniatunufus¹, Yushy Kurnia Herliani², Nursiswati²

¹ Professional Student, Faculty of Nursing, Universitas Padjadjaran, Bandung 45363, Indonesia

² Lecturer of Medical Surgical Nursing, Faculty of Nursing, Universitas Padjadjaran, Bandung 45363, Indonesia

ABSTRACT

Introduction: Stroke is the most common cause of morbidity and mortality worldwide, including Indonesia. Knowledge of stroke risk factors and symptoms can improve stroke prevention strategies and reduce the risk of the fatal disease. People who have high blood pressure, diabetes, or cardiovascular disease are at a higher risk for stroke. Therefore, this study aims to examine the knowledge of risk factors and symptoms of stroke in patients with hypertension, diabetes mellitus, and congestive heart failure (CHF). **Methods:** This study was descriptive with a non-probability sampling technique of purposive sampling involving 99 patients with hypertension, diabetes mellitus, and CHF who visited the Outpatient clinic. Data collection using the Stroke Recognition Questionnaire (SRQ) has been validated and proven reliable. The data were analyzed using univariate analysis, including frequency distribution and percentage. **Results:** This study shows that most respondents have moderate knowledge related to risk factors and symptoms of stroke (54.6%). Diabetes mellitus (42.4 %), smoking (40.4 %), and alcohol consumption (38.4%) are the most common risk factors for stroke that patients are unaware. Furthermore, patients are largely unaware of the symptoms of stroke, which include visual disturbances in one or both eyes (65.7%), confusion (64.7%), and sudden dizziness (54.6%). **Conclusion:** More than forty percent of participants are unaware that diabetes and smoking are potential causes of stroke. It is recommended to increase health education programs about risk factors and symptoms of stroke to take preventive measures.

Keywords: Knowledge, Risk factors, Stroke, Stroke symptoms

Corresponding Author:

Maniatunufus, S.Kep

Email: maniatunufus17001@mail.unpad.ac.id

Tel: +62 895-3528-41499

INTRODUCTION

Stroke is an emergency condition requiring immediate attention. According to the World Health Organization (2018), stroke is the world's second most common cause of fatality. Data obtained from the WHO in 2016, approximately 15.2 million people worldwide die each year due to a stroke. In addition, stroke is also a significant cause of disability globally (2). In 2013, the prevalence of stroke in Indonesia was 12.1%, and in 2018 it was 10.9% (3,4). The number of deaths in Indonesia caused by stroke increases every year. In 2015 there were 332.6 thousand deaths due to stroke, an increase from 2010, which accounted for 282.8 thousand. Based on Baseline Health Research (RISKESDAS) in 2013, the prevalence of stroke in Banten Province was 9.6% (3) and rose to be 11 % in 2018(4).

Stroke is associated with numerous risk factors. There

are controllable risk factors that can cause strokes, such as hypertension (four times the risk of having a stroke), diabetes mellitus (almost three times having a greater risk of a stroke), and heart disease (twice as likely to have a stroke) (5). Hypertension is the leading cause of stroke. When hypertension, blood vessels experience considerable pressure. If the pressure lasts for a long time, it can cause weakness in the blood vessel walls so that the blood vessels become fragile and break easily. In addition, hypertension can also cause narrowing of the diameter of blood vessels, so that blood flow to the brain becomes disrupted (6).

In addition to hypertension, diabetes mellitus is also a risk factor for stroke. Diabetes mellitus develops when the body cannot produce or use insulin properly. Diabetes mellitus accumulates sugar in the blood and prevents nutrients from entering the body, including the brain. Diabetes mellitus also causes microangiopathy and macroangiopathy, which raises the risk of stroke (6). (6). Moreover, heart disease, including coronary artery disease, heart valve defects, irregular heartbeat (atrial fibrillation), enlarged heart chambers, and heart failure, is also a risk factor for stroke. Coronary artery disease

raises the risk of stroke because plaque accumulates in the arteries, obstructing the flow of oxygen-rich blood to the brain. In comparison, heart valve defects, atrial fibrillation, and enlarged heart chambers are risk factors for stroke because they can cause blood clots and rupture (6).

Stroke symptoms are also significant for patients to be awarded in preventing stroke complications. In general, the symptoms of a stroke are severe headache, dizziness, confusion, blurred or decreased vision, difficulty speaking, characterized by the mouth being pulled to one side, loss of balance, numbness, and muscles restriction on one side of the body (7). Individuals frequently arrive at the hospital more than three hours after suffering a stroke, with an average delay of 23 hours and 12 minutes. Due to a lack of knowledge about stroke symptoms, they cannot recognize the symptoms and do not immediately go to the hospital, resulting in delayed stroke treatment (8).

Individuals who have a good understanding of stroke risk factors and symptoms will prevent stroke (9). Individuals with more knowledge about stroke risk factors can improve prevention strategies by controlling stroke risk factors. In addition, increasing knowledge about stroke symptoms in individuals allows them to recognize them quickly and reach the hospital immediately to receive better care (10).

Previous studies examined how awareness of stroke risk factors and warning signs affects patient arrival times at the emergency department. This study indicates that the better the knowledge about risk factors and symptoms of stroke, the sooner family members bring stroke patients to the hospital (8). Most previous studies focused on hypertension as a stroke risk factor and did not examine other risk factors. Therefore, this study aims to investigate the knowledge of risk factors and symptoms of stroke in patients with hypertension, diabetes mellitus, and CHF.

MATERIALS AND METHODS

Study design

This quantitative study was conducted in a public hospital in Cilegon City, Banten Province, using a descriptive research design. Data collection was conducted at the Outpatient clinic for CHF, Diabetes mellitus, and Hypertension from Apr 26 to May 10, 2021.

Sample and setting

The population in this study were all patients with risk factors for stroke, namely patients with hypertension, diabetes mellitus, and CHF who visited the outpatient clinic. The sampling technique was purposive. The inclusion criteria were patients suffering from one or more diseases of hypertension, diabetes mellitus, and CHF who were visited Outpatient clinics, aged 18 years or more, had never had a stroke, and conscious. The

exclusion criteria were having a diagnosis of dementia and the presence of hearing loss.

Instruments

The instrument used is the Stroke Recognition Questionnaire (SRQ) (11,12) and carried out translation and validity and reliability tests by researchers.

Analysis

The instrument consists of 18 stroke risk factors (10 positive statements, eight negative statements) and 17 stroke symptoms (10 positive statements, seven negative statements). Knowledge is categorized as "high" if the score obtained is 27-35, knowledge "moderate" if the score is 20-26, and knowledge is "low" if the score is 0-19. The data analyses were performed using univariate analysis.

Ethical consideration

This study obtained ethical approval from the Research Ethics Committee, Faculty of Medicine Universitas Padjadjaran No. 216/UN6.KEP/EC/2021

RESULTS

A total of ninety-nine respondents participated in this study. The average age was 52.2 years old. The majority of respondents (66.7%) are female, graduated from high school (36.4%), are housewives (49.5%), and have never cared for a family member who has had a stroke (44.4%). A total of 36 (36.4%) respondents received health information from two sources. The respondent's medical history was dominated by CHF, as many as 49 (49.5%). The duration of the disease that most suffered by hypertensive patients was <1 year (4%) While in patients with diabetes mellitus, namely 1-3 years (2%) and >3 years (2%), in patients with CHF, it is 1-3 years (28.3%), and in diseases with more than one stroke risk factor, namely at most for 1-3 years (19.2%) (Table I).

Level of Knowledge about Risk Factors and Symptoms of Stroke

The majority of participants have moderate knowledge related to risk factors and symptoms of stroke (Table II).

The adult group (18-59 years old) had a higher percentage of "high" knowledge than the older people group (≥ 60 years old). Respondents with a junior high school education have the highest percentage of "high" knowledge. Respondents with the highest percentage of "high" knowledge are those who have cared for a family member who has had a stroke (Table III).

Knowledge of Risk Factors of Stroke

Patients are aware of the risk factors for stroke, including high blood pressure, high cholesterol, and sedentary activities. In contrast, the risk factors for stroke that are still largely unknown to patients are alcohol consumption of more than two glasses per day, smoking, and diabetes

Table I: Demographic Characteristics of Respondents (n=99)

Characteristics	Frequency (f)	Percentage (%)
Age		
18-59 years old	68	68.7
≥60 years old	31	31.3
Gender		
Man	33	33.3
Woman	66	66.7
Last education		
No school	5	5.0
SD	22	22.2
Junior high school	17	17.2
Senior high school	36	36.4
D1-D3/College (S1/S2/S3)	19	19.2
Work		
Work	27	27.3
Retired	13	13.1
Housewife	49	49.5
Unemployed/not working	10	10.1
Experience with stroke		
Get to know someone who has experienced strokes	38	38.4
Have ever cared for a family with a stroke	17	17.2
Have no experience associated with stroke	44	44.4
Source of health information		
1 source of information	28	28.3
2 sources of information	36	36.4
3 sources of information	22	22.2
>3 sources of information	13	13.1
Disease history		
Hypertension	6	6.1
Diabetes mellitus	5	5.0
Heart disease	49	49.5
More than one stroke risk factor	39	39.4
Length of illness		
Hypertension		
<1 year	4	4.0
1-3 years	1	1.0
>3 years	1	1.0
Diabetes mellitus		
<1 year	1	1.0
1-3 years	2	2.0
>3 years	2	2.0
Heart disease		
<1 year	11	11.1
1-3 years	28	28.3
>3 years	10	10.1
More than one stroke risk factor		
<1 year	11	11.1
1-3 years	19	19.2
> 3 years	9	9.1

Table II: Level of Knowledge about Risk Factors and Symptoms of Stroke (n=99)

	f	%
High knowledge	30	30.3
Moderate knowledge	54	54.6
Low knowledge	15	15.1

Table III: Level of Knowledge about Risk Factors and Stroke Symptoms based on Characteristics of Respondents (n=99)

Characteristics	"High" Knowledge		"Moderate" Knowledge		"Low" Knowledge	
	f	%	f	%	f	%
Age						
18-59 years old (n=68)	22	32.3	38	55.9	8	11.8
≥60 years old (n=31)	8	25.8	16	51.6	7	22.6
last education						
No school (n=5)	0	0	2	40.0	3	60.0
Elementary (n=22)	5	22.7	8	36.4	9	40.9
Junior high school (n=17)	7	41.2	10	58.8	0	0
Senior high school (n=36)	12	33.3	22	61.1	2	5.6
D1-D3/College (S1/S2/S3) (n=19)	6	31.6	12	63.2	1	5.2
Experience with stroke						
Get to know someone who has experienced strokes (n=38)	13	34.2	20	52.6	5	13.2
Have ever cared for a family with a stroke (n=17)	8	47.1	8	47.1	1	5.8
Have no experience associated with stroke (n=44)	9	20.5	26	59	9	20.5

(Table IV).

Table IV: Knowledge of Stroke Risk Factors (n=99)

Statement Items	Yes		No	
	f	%	f	%
Consumption of alcohol more than 2 glasses per day	61	61.6	38	38.4
Irregular heartbeat such as atrial fibrillation	71	71.7	28	28.3
High blood pressure	92	92.9	7	7.1
Diabetes	57	57.6	42	42.4
High blood cholesterol	82	82.8	17	17.2
Lack of physical activity	76	76.8	23	23.2
Overweight more than 20 pounds (9.072 kg)	70	70.7	29	29.3
Have a history of having a heart attack	67	67.7	32	32.3
Smoke	59	59.6	40	40.4
Have a history of neck vein disease or narrowed blood vessels	62	62.6	37	37.4

Knowledge of Stroke Symptoms

Symptoms of stroke that are well known to patients are numbness on one side of the face, difficulty walking, and slurred and confused speech. At the same time, the symptoms of stroke that are still largely unknown to patients are confusion, double vision, and sudden unexplained dizziness (Table V).

Table V: Knowledge of Stroke Symptoms (n=99)

Statement Items	Yes		No	
	f	%	f	%
Confused	35	35.3	64	64.7
Double vision	34	34.3	65	65.7
Weakness on one side of the body	74	74.8	25	25.2
Numbness on one side of the face	87	87.9	12	12.1
Loss of balance	68	68.7	31	31.3
It's hard to walk	83	83.8	16	16.2
Sudden severe headache	60	60.6	39	39.4
Unclear and confusing speech	81	81.8	18	18.2
Unexplained sudden dizziness	45	45.4	54	54.6
Problems with coordination	66	66.7	33	33.3

DISCUSSION

One of the uncontrollable risk factors for stroke is age. More than a third of respondents in this study were over the age of 60, and most of the respondents were patients with CHF. The older the age, the greater the incidence of plaque that sticks to blood vessels' walls, disrupts blood flow, and causes heart disease (13). People, as they age, have less interaction with society and are less interested in medical advances (14). As a result, it can make it easy to have stroke risk factors. In addition to age, sex is also a risk factor for stroke that cannot be controlled. The results showed that the majority of respondents were women. It is consistent with the data, which shows that women outnumber men in the population with hypertension, diabetes, and CHF (4). Women are more at risk because of the role of the estrogen hormone. Women who experience menopause will cause a decrease in the hormone estrogen, which can facilitate blood flow and maintain the flexibility of blood vessels (15). The results showed that most respondents have never cared for a family member who has had a stroke. Research states that individuals who have experience to care for stroke will be more alert to avoid stroke (16). One form of alert that can be done is to seek health information. Healthy lifestyles that can be performed include taking time to exercise, eating healthy foods, having regular check-ups, and immediately going to health professionals to check their symptoms.

According to the findings, most health information was obtained from at least two sources: television, doctors or nurses, newspapers or magazines, family members or friends, and the internet. Individuals who follow medical developments tend to have good knowledge to prevent strokes, which can be reflected in the search results for health information (14). The more information obtained, the better the individual's knowledge (17). Furthermore, the majority of respondents had a history of heart disease, both single heart disease and heart disease with hypertension and diabetes mellitus, according to the findings. Congestive Heart Failure is the most common type of heart disease, whether single heart

disease or a combination of heart disease, hypertension, and diabetes mellitus. Patients with cardiovascular problems have an increased risk for ischemic stroke (18) due to multiple comorbidities that can increase the risk of atherosclerosis (19). The results showed that most had suffered from CHF for 1-3 years. According to research (14), the longer the disease duration, the better the individual's knowledge of risk factors and stroke symptoms.

The results showed that patients in the adult group (18-59 years old) had a higher percentage of high knowledge than the elderly group (≥ 60 years old). It is consistent with research conducted in Ethiopia, Iraq, and Nigeria, which revealed that younger people better understand stroke risk factors and symptoms than older people (14,20,21). Individuals with older age can cause limited interaction with the community and a lack of interest in following medical informations, resulting in less knowledge. The results showed that knowledge about risk factors and stroke symptoms was better in the higher educated group. A previous study revealed that individuals with higher levels of education had better knowledge about risk factors and symptoms of stroke than individuals with lower levels of education (14,20,22,23). Individuals with higher levels of education are more likely to find out about health from various sources.

The risk factors for stroke that patients know are hypertension, hyperlipidemia, and sedentary activities. It is consistent with previous research, which found that the majority of respondents' widely known risk factors for stroke were hypertension (92%), eating foods high in fat (85.7%) (24), physical inactivity (61.7%), and hypertension (55.5%) (22). In addition, the results showed that the risk factors for stroke that are still largely unknown to patients are alcohol consumption of more than two glasses per day, smoking, and diabetes. These are in line with prior studies that showed diabetes mellitus (25), smoking, and alcohol intake (14) were not risk factors for stroke.

The results showed that the most common stroke symptom items were numbness on one side of the face, difficulty walking, and slurred and confused speech. It is in line with previous research that showed most respondents widely know about stroke symptoms were numbness on one side of the face, arms, or leg, difficulty in moving and walking, loss of balance, and speech disorders (22,25). Furthermore, many patients are unaware that symptoms of a stroke include confusion, double vision, and sudden unexplained dizziness. It is consistent with the findings of a previous study, which revealed that the majority of respondents believed that sudden confusion, difficulty speaking or understanding other people, sudden vision limitation in one or both eyes, sudden dizziness, immobility, and loss of balance were not symptoms of stroke (14). Individuals suffering from stroke have impaired brain

function due to damaged or dead brain tissue caused by decreased blood flow to the brain. One of the brain's functions is interpreting the visual part (vision). Therefore if there is a disturbance in the brain, there will also be a disturbance in vision (7,28). Confusion, double vision, and sudden unexplained dizziness, which are symptoms of a stroke, are fundamental for high-risk stroke patients to know to prevent stroke by immediately deciding to go to the hospital to get help. The sooner a person is diagnosed and treated, the better the results. The success of the medical treatment and nursing intervention is related to efforts to minimize delays when stroke symptoms occur (6,8,29).

The limitation of this study is that conducted in a single-center setting. However, this study included sufficient respondents for a descriptive study. Therefore, it is recommended to conduct further studies in multicenter settings.

CONCLUSION

The majority of knowledge about risk factors and symptoms of stroke is in the moderate category. Knowledge about stroke risk factors is still largely unknown to patients, namely diabetes mellitus, smoking, and alcohol consumption. In contrast, knowledge about stroke symptoms is still largely unknown, namely visual disturbances in one or both eyes, confusion (disorders in space, time, or personal orientation), and sudden dizziness. It is crucial to know the risk factors and symptoms of stroke so that individuals can prevent and treat stroke properly.

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