Original Article

# Awareness among Stroke Survivors about Stroke Risk Factors and Warning Signs

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**Abstract**

**Background & Aim:** Survivors after stroke have a greater risk of recurrent stroke. This study aimed to determine the awareness of stroke survivors about the risk factors and warning signs of a stroke.
**Methods & Materials:** This descriptive, cross-sectional study was conducted between April 10 and August 30, 2016, at the department of neurology at a university hospital in Izmir, Turkey. The study included 105 stroke survivors over the age of 18 who could communicate verbally and scored >24 on the Standardized Mini-Mental State Examination. The data were collected through face-to-face interviews using a Stroke Survivor Identification Form and Stroke Knowledge Questionnaire.
**Results:** Most frequently known risk factors were hypertension (95.2%), high cholesterol (87.6%), and stress (85.7%); least frequently known risk factors were male gender (46.7%), alcohol (66.7%), and the history of stroke (63.8%). Most frequently known warning signs were sudden speech disorder (98.1%), sudden weakness on one side of the body (98.1%), and sudden numbness on the face (98.1%); least frequently known warning signs were sudden confusion and difficulty in comprehension (81.9%), sudden onset of severe and unexplained headache (80.0%) and sudden visual impairment in one eye or both eyes (58.1%).
**Conclusion:** The study found that stroke survivors had inadequate awareness about certain risk factors (gender, alcohol, and the history of stroke or transient ischemic attack) and warning sign (sudden visual problem in one eye or both eyes). Effective training programs should be planned and implemented for stroke survivors.

**Keywords:** stroke, risk factors, patient education, nursing

## Introduction

Cerebrovascular diseases (CVDs) are the second most common cause of death worldwide and a common cause of chronic neurological disability in adults; therefore, CVDs are increasingly recognized as a significant public health issue (1-3). Stroke, considered a CVD, is the second most common cause of death after myocardial infarction and the leading cause of disability (4, 5). Diseases of the circulatory system were reported by Turkish Statistical Institute (TSI) to be the leading cause of death (38.4%) in Turkey in 2018; and among these, CVDs were the second most common cause of death (22.4%) (6). This represents a considerable burden to our country. Stroke survivors are at high risk of new cerebrovascular diseases. Previous research shows that stroke awareness plays an important role in preventing secondary stroke attacks. However, little is known about stroke warning signs and risk factors among stroke survivors. Emergency and acute care have a significant impact on the mortality and outcome of stroke (7-9). Studies have indicated the significance of raising awareness in general public and stroke survivors about the risk factors and warning signs of a stroke. Knowledge and awareness about these factors and signs facilitates access to emergency treatment, increases potential treatment options, and helps improve the treatment outcomes after stroke (10-13). Donkor et al. (2014) found a low level of public awareness and indicated that community-based education programs are of great importance in reducing the risk factors and implementing vital interventions at the onset of stroke (12). Similarly, Zeng et al. (2012) have reported that knowledge about stroke warning signs and risk factors was very poor in patients with previous stroke or transient ischaemic attacks in China. In Turkey, studies involving high school teachers and caregivers of patient with and not

with stroke have been reached, but studies investigating stroke risk factors and warning signs in stroke individuals have not been reached (11-25). Patient's knowledge about the risk factors and warning signs of a stroke, which has severe consequences for the individual, family, and community, is important for reducing the incidence of stroke and planning nursing interventions to prevent permanent injuries due to stroke (11-13). This study was to aim to determine the awareness about the risk factors and warning signs of stroke among stroke patients.

**Materials and Methods:** This study has a descriptive and cross-sectional design. The universe of the study consisted of patients who applied to and received treatment in the inpatient and outpatient clinics at the Department of Neurology at a university hospital in Izmir, Turkey, between 10 April and 30 August 2016. The sample of the study consisted of 105 individuals. Individuals who had a stroke at least in the past year, were above the age of 18, had the capacity of verbal communication, had a normal cognitive state (scored higher than 24 points in Standardized Mini-Mental State Examination), and accepted to participate in the study were included in the study.

***Data collection tools:*** Data were collected through face-to-face interviews using Stroke Survivor Identification Form and Stroke Knowledge Questionnaire. Each interview lasted about 15-20 minutes.

**Stroke Survivor Identification Form:** was created by the researchers and included 20 questions to determine socio-demographic characteristics such as age, gender, and education, based on previous studies in the field.

**Stroke Knowledge Questionnaire** was prepared by the researchers based on previous studies (10,12,16-18). The questionnaire consists of seven questions to probe stroke survivors' knowledge about the definition of stroke, its risk factors and warning signs, and what to do during a stroke. The questionnaire includes closed-ended questions as well as those that could be answered as 'yes', 'no', or I do not know'. The self-report questionnaire was applied by the researchers in a face-to-face interview method. Pretest was made with 15 partipicants and unclear questions about the questionnaire were identified and edited in the study.

***Ethical consideration:*** The local Ethics Committee approved the study (06.04.2016/130); the institution where the study was conducted granted written permission. All participants signed an informed consent form that includes the purpose of the study and declares their voluntary participation.

***Data analysis:*** The data were compiled and analyzed with SPSS version 21.0 (SPSS Inc., Chicago, IL). The data were analyzed and presented as frequency, percentage, mean, and standard deviation.

## Results

Of the participants, 75.2% were 55 or older, 67.6% were male, 94.3% were married, 49.5% were primary-school graduates, 63.8% were retired, 73.3% did not smoke, 95.2% did not consume alcohol, and 55.2% had a comorbid chronic disease (Table 1). Furthermore, 90.5% of the participants had stroke attack once, 9.5% had two or more stroke attacks, 27.6% had dizziness, imbalance, and loss of strength/drowsiness as first signs of stroke, 63.8% called an ambulance as the first step, 72.4% applied to an emergency department, and 74.3% received medication for stroke. Two-thirds of the participants defined stroke as 'an illness that affects the brain and causes immobility'; 24.8% reported that they had information about stroke from family, relatives, those who had a stroke, and healthcare professionals. The participants identified the following conditions as a risk factor for stroke: hypertension (95.2%), high cholesterol (87.6%), stress (85.7%), being overweight (84.8%), unhealthy diet (81.9%), heart disease (81.0%), advanced age (78.1%), family history (77.1%), smoking (75.2%), inadequate physical activity (75.2%), diabetes (70.5%), transient ischemic attack (68.6%), alcohol consumption (66.7%), history of stroke (63.8%), and male gender (46.7%) (Table 2). The participants identified the following conditions as a warning sign for stroke: sudden speech disorder (98.1%), sudden weakness on one side of the body (98.1%), sudden numbness on the face (98.1%), sudden numbness on one side of the body (94.3%), sudden dizziness (87.6%), sudden loss of balance or coordination (87.6%), sudden confusion and difficulty in comprehension (81.9%), sudden onset of severe and unexplained headache (80.0%) and sudden visual impairment in one eye or both eyes (58.1%) (Table 2). The participants identified the following conditions as the results of stroke: loss of ability to walk (100%), loss of strength on one side of the body (100%), loss of speech (98.1%), loss of vision (93.3%), the requirement for relearning (90.5%) and loss of hearing (85.7%) (Table 2).

**Table 1.** Descriptive statistics of stroke survivors (N=105).

| | n | % |
|---|---|---|
| **Age group** | | |
| 18-54 | 26 | 24.8 |
| 55 and above | 79 | 75.2 |
| **Gender** | | |
| Female | 34 | 32.4 |
| Male | 71 | 67.6 |
| **Marital status** | | |
| Married | 99 | 94.3 |
| Single | 6 | 5.7 |
| **Education level** | | |
| İlliterate | 3 | 2.9 |
| Literate | 11 | 10.5 |
| Primary School | 52 | 49.5 |
| Middle School | 11 | 10.5 |
| High School | 25 | 23.8 |
| Bachelor's Degree | 3 | 2.9 |
| **Occupation** | | |
| Employee | 2 | 1.9 |
| Officer | 1 | 1.0 |
| Retired | 67 | 63.8 |
| Self-employment | 10 | 9.5 |
| Housewife | 25 | 23.8 |
| **Tobacco use** | | |
| Yes<br>half pack (n=9); full pack (n=19) | 28 | 26.7 |
| No | 77 | 73.3 |
| **Living place** | | |
| The village / town | 8 | 7.6 |
| District | 64 | 61.0 |
| Province | 33 | 31.4 |
| **Alcohol use** | | |
| Yes | 5 | 4.8 |
| No | 100 | 95.2 |
| **Comorbid chronic diseases** | | |
| **Yes**<br>(Hypertension (n=45), Diabetes (n=28) | 58 | 55.2 |
| **No** | 47 | 44.8 |

**Table 2. Rate of correct response among stroke survivors for questions about the risk factors, warning signs, and outcomes of stroke.**

| ***Stroke Risk Factors*** | **n** | **%** |
|---|---|---|
| Hypertension | 100 | 95.2 |
| High cholesterol | 92 | 87.6 |
| Being overweight | 89 | 84.8 |
| Stress | 90 | 85.7 |
| Unhealthy diet | 86 | 81.9 |
| History of heart disease | 85 | 81.0 |
| Advanced age | 82 | 78.1 |
| Family history | 81 | 77.1 |
| Smoking | 79 | 75.2 |
| Inadequate physical activity | 79 | 75.2 |
| | | |
| Diabetes mellitus | **74** | **70.5** |
| Alcohol consumption | 70 | 66.7 |
| History of stroke | 67 | 63.8 |
| History of transient ischemic attack | 72 | 68,6 |
| Male gender | 49 | 46.7 |
| ***Stroke Warning Signs*** | | |
| Sudden speech disorder | 103 | 98.1 |
| Sudden weakness on one side of the body | 103 | 98.1 |
| Sudden numbness on the face | 103 | 98.1 |
| Sudden numbness on one side of the body | 99 | 94.3 |
| Sudden dizziness | 92 | 87.6 |
| Sudden loss of balance or coordination | 92 | 87.6 |
| Sudden confusion and difficulty in comprehension | 86 | 81.9 |
| Sudden onset of severe and unexplained headache | 84 | 80.0 |
| Sudden visual impairment in one eye or both eyes | 61 | 58.1 |
| ***Conditions as the results of stroke*** | | |
| Loss of ability to walk | 105 | 100 |
| Loss of strength on one side of the body | 105 | 100 |
| Loss of speech | 103 | 98.1 |
| Loss of vision | 98 | 93.3 |
| The requirement for relearning | 95 | 90.5 |
| Loss of hearing | 90 | 85.7 |

## Discussion

Our study has found that awareness of partipicants was moderately high. More than half of the participants correctly identified smoking, alcohol consumption, being overweight, inadequate physical activity, hypertension, stress, high cholesterol level, unhealthy diet, family history, advanced age, certain medications, diabetes, and the history of stroke, transient ischemic attack, and heart disease as the risk factors for stroke. Such a high level of awareness may be because, the sample in this study only included the survivors of a previous stroke. Previous experience of stroke might have increased their awareness about the disease and its risk factors. In addition, the closed-ended questionnaire may have contributed to the high scores of the participants. Previous studies have reported that individuals with a high risk of stroke, i.e. survivors after stroke, have higher adherence to the practices aimed at preventing stroke.

Hypertension, high cholesterol, and stress are the most common risk factors identified by the participants in this study. Sloma et al. (2010) reported that hypertension, hyperlipidemia and smoking were the risk factors most frequently identified by the 240 patients with stroke or transient ischaemic attacks diagnoses. In another study on the awareness about the risk factors and warning signs of stroke, showed that hypertension was the most frequently known risk factor by the participants (between 27.5% and 51.2%) and that 95% of the participants were able to identify hypertension as a risk factor when provided a list (20). A list of risk factors was also presented to the participants in our study, and more than 85% correctly identified hypertension as a risk factor.

We found that more than half of the participants were aware of the warning signs of a stroke. Patients most commonly identified sudden speech disorder, sudden weakness on one side of the body and sudden numbness on the face; sudden confusion and difficulty in comprehension, sudden onset of severe and unexplained headache and sudden vision problems in one eye or both eyes were the least commonly known stroke signs. In a similar study with stroke survivors, Saengsuwan et al. (2017) found that sudden numbness in the face and extremities were the most commonly known signs of a stroke while sudden vision problems were the least commonly known. In the majority of studies conducted in developed or developing countries, participants were not able to identify the key warning signs of stroke such as sudden speech disorder or vision problems. The lack of awareness about the warning signs of stroke is a significant problem that prevents timely access to healthcare services (22-25).

**Conclusion:** Our study has found that awareness of certain risk factors (gender, alcohol, and the history of stroke or transient ischemic attack) and warning sign (a sudden visual problem in one eye or both eyes) was inadequate in stroke survivors. The awareness of stroke-related issues among individuals with increased risk of stroke is crucial in preventing recurrent strokes through appropriate measures and providing timely access to healthcare services during a stroke. Therefore, public-education campaigns suitable for diverse age groups should be implemented through healthcare personnel or appropriate media channels to increase awareness. As they have a key role in educating the patients and their families, stroke nurses should emphasize the risk factors and warning signs of a stroke. It is recommended that the research be conducted on a more comprehensive sample for future studies.

**Limitations:** Conducting the research in a single unit was determined as the limiting factor of the research. Furthermore, the established inclusion criteria limit the generalizability of the results.

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