

Awareness of risk factors and warning signs of stroke among caregivers of patient with and not with stroke: Results from questionnaire

Oznur Usta Yesilbalkan,¹ Ayfer Karadakovan,² Birgul Vural Dogru,³ Perihan Akman,⁴ Ebru Ozel,⁵ Yucel Bozturk⁶

Abstract

Objective: To assess the awareness/knowledge of stroke risk factors and warning signs among caregivers of patients with or without stroke.

Methods: The cross-sectional, descriptive and comparative study was conducted in the neurology clinic and polyclinic of a university hospital in Izmir, Turkey, from March to July 2014, and comprised primary caregivers of patients with stroke in group 1 and those of patients with no stroke in group 2. The subjects were screened and data was collected using the Participant Information Form and the Questionnaire Form About Stroke. Warning signs and symptoms of stroke were compared between the two sets of caregivers. SPSS 17 was used for data analysis.

Results: Of the 203 respondents, 105 (52%) were in group 1 and 98 (48%) in group 2. Group 1 had better awareness than group 2 ($p < 0.05$). In group 1, weakness was the most commonly recognised warning sign 101 (96.2%), whereas dyspnoea 41 (39%), was the least commonly identified. There was no relationship of stroke knowledge with educational level and age ($p > 0.05$ each).

Conclusion: Caregivers had a moderate knowledge of some of the warning signs and risk factors about stroke.

Keywords: Awareness, Caregiver, Risk factor, Stroke, Warning. (JPMA 69: 1114; 2019)

Introduction

Stroke is one of the leading causes of morbidity and mortality the world over and is a preventable public health problem.^{1,2} Stroke is one of the major health problems in Turkey. A cerebrovascular disease is the second leading cause of death in Turkey and has the third place in terms of loss of disability adjusted life years (DALYs) at an estimated rate of 5.9% according to the World Health Organisation (WHO) and Turkish Health Statistics.³ Stroke incidence and prevalence were notified as 69.6 and 310/100,000 populations in a recent study conducted by the Turkish Ministry of Health, which is believed to be an underestimation.³

Stroke is a preventable public health problem. To reduce the incidence of stroke, there is a need to start with public awareness and to ultimately the review the national health policy. The level of public awareness and knowledge about stroke risk factors and warning signs is critical for ensuing adequate access to preventative treatments.^{1,4,5} Assessment of public awareness is most important for the development of appropriately targeted health promotion campaigns to prevent stroke among the high-risk population.⁴ Several studies have revealed

that there is lack of knowledge regarding stroke warning signs and risk factors.^{1,4,5} Awareness might facilitate a faster realisation of stroke and immediate activation of pre-hospital emergency mechanism.^{1,2}

The current study was planned to assess the awareness/knowledge of stroke risk factors and warning signs among caregivers of patients with and without stroke.

Subjects and Methods

The cross-sectional, descriptive and comparative study was conducted in the neurology clinic and polyclinic of a university hospital in Izmir, Turkey, from March to July 2014, and comprised primary caregivers of patients with stroke in group 1 and those of patients with no stroke in group 2. Sample size was not calculated and all primary caregivers aged 18 years or more who were cognitively intact to communicate and consented to participate were enrolled using convenience sampling. Those who did not meet any element of the criterion were excluded.

The study was approved by the relevant ethical committees, and written consent was obtained from the subjects.

Data was collected using Participant Information Form (PIF) and the Questionnaire Form About Stroke (QFAS). PIF had 15 questions about socio-demographic characteristics (9 questions) and disease characteristics (6 questions). The QFAS assessed the caregivers' awareness/knowledge about risk factors and warning signs of stroke. The questionnaire was designed especially for the current

.....
^{1,2}Ege University Faculty of Nursing, Internal Medicine Nursing, Izmir, ³Mardin Artuklu University Health College, Nursing Department, Mardin, ⁴⁻⁶Ege University Hospital, Neurology Clinic, Izmir, Turkey.

Correspondence: Birgul Vural Dogru. Email: bvuraldogru@gmail.com

study-based on literature.⁵⁻¹² The knowledge level was defined as 'good', 'moderate' and 'poor' according to the distribution of percentiles of correct answers. The subjects took about 15 minutes to fill the survey forms which was done in Turkish language by trained researchers.

SPSS 17 was used for statistical analysis. For continuous variables, mean $\pm$ standard deviation (SD) were calculated. Chi-square test was used to check the association between the identified risk factors and warning signs of the stroke. The results were evaluated at a 95% level of reliability and $p < 0.05$ was taken as statistically significant.

Results

Of the 203 respondents, 105(52%) were in group 1 and

Table-1: Characteristics of respondents.

Variables (n=203)	Caregivers of patient with stroke (n=105)	Caregivers of patient without stroke (n=98)	Total (n=203)
Age, mean	46.13 $\pm$ 1.24	47.72 $\pm$ 1.31	46.90 $\pm$ 12.79
Sex			
Females	71 (67.6)	69(70.4)	140 (69.0)
Males	34 (32.4)	29(29.6)	63 (31.0)
Marital status			
Married	79 (75.2)	86 (87.8)	165 (81.3)
Divorced/widow	19 (18.1)	9 (9.2)	28 (13.8)
Single	7(6.7)	3 (3.1)	10 (4.9)
Educational levels			
Literate- Illiterate	12 (11.5)	18 (18.3)	30 (14.7)
Primary school	50 (47.6)	40 (40.8)	90 (44.3)
High school	25(23.8)	25 (25.5)	50 (24.6)
University	18 (17.1)	15 (15.3)	33 (16.3)
Working status			
Full time	34 (32.4)	20 (20.4)	54 (26.6)
Part time	5 (4.8)	9 (9.2)	14 (6.9)
Does not work	66 (62.9)	69 (70.4)	135 (66.5)
Income status			
Poor	21 (20.0)	27 (27.6)	48 (23.6)
Medium	71 (67.6)	61 (62.2)	132 (65.0)
Good	13 (12.4)	10(10.2)	23 (11.3)
Have chronic disease			
Yes	49(46.7)	32 (32.7)	81 (39.9)
No	56 (53.3)	66 (67.3)	122 (60.1)
The degree of closeness with the patient			
Mother / father	26 (24.8)	28 (28.6)	54 (26.6)
Children	31 (29.5)	14 (14.3)	45 (22.2)
Partner	35 (33.3)	36 (36.7)	71 (35.0)
Relative	2 (1.9)	6 (6.1)	8 (3.9)
Other	11 (10.5)	14 (14.3)	25 (12.3)
Family history of stroke or TIA			
Yes	41 (39.0)	26 (26.5)	67 (33.0)
No	64(61.0)	72 (73.5)	136 (67.0)

TIA: Transient ischaemic attack.

Table-2: Level of awareness regarding the risk factors and warning symptoms of stroke.

Knowledge of risk factors and warning signs	Caregivers of patient with stroke (n=105) n (%)	Caregivers of patient without stroke (n=98) n (%)	Total (n=203) n (%)
Knowledge of risk factors			
Good	2 (1.9)	0 (0.0)	2 (1.0)
Moderate	82 (78.1)	62 (63.3)	144(70.9)
Poor	21 (20.0)	36 (36.7)	57 (28.1)
Knowledge of warning signs			
Good	22 (21.0)	15 (15.3)	50 (24.6)
Moderate	66 (62.9)	50 (51.0)	116(57.1)
Poor	17 (16.2)	33 (33.7)	37 (18.2)

98(48%) in group 2 with an overall mean age of 46.90 $\pm$ 12.79 years (Table-1). In the terms of awareness, 2(1.0%) subjects had good knowledge, 144(70.9%) moderate and 57(28.1%) had poor knowledge regarding the risk factors. Besides, 50(24.6%) subjects had good, 116(57.1%) moderate and 37(18.2%) had poor knowledge of warning symptoms of stroke (Table-2).

Overall, 156(76.8%) subjects recognised brain as the organ affected by stroke. Hypertension was the most commonly identified risk factor 178(87.7%), and gender was the least identified 27(13.3%). There were significant differences in the awareness of some risk factors, with groups 1 caregivers having better awareness ($p < 0.05$). Weakness was the most commonly recognised warning sign 192(94.6%), whereas dyspnoea 72 (35.5%), heart palpitations 88(43.3%) and nausea/vomiting 94(46.3%) were the least commonly identified (Table-3).

The questions, "What do you do at first when you realise that you or someone else is having an acute stroke?" was answered as, "I call the ambulance" 127 (62.6%), "I take the patient to hospital"89(43.8%), "I call one of the family members"44(21.7%), and "I apply cold water to the head"41(20.2%), and "I call the doctor"14(12.2%).

Regular medical check-up was the most commonly recognised stroke prevention measure 137(67.5%), whereas restriction of alcohol consumption 99(48.8%) and managing ideal weight 102(50.2%) were the least commonly identified. The main sources of information about stroke were patients with stroke 22(10.8%), television 17(8.4%), relatives 16(7.9%), and newspapers and books 11(5.5%). Also, 136(67.0%) respondents wanted to get information about preventive measures and early signs and symptoms of stroke (Table-4).

Table-3: Respondents' awareness of risk factors and warning signs of stroke.

Response	Caregivers of patient with stroke (n=105) n (%)	Caregivers of patient without stroke (n=98) n (%)	Total (n=203) n (%)	p value
Target organ				
Brain	82(78.1)	74(75.5)	156 (76.8)	0.718
Risk factors				
Hypertension	93(88.6)	85(86.7)	178(87.7)	0.787
High cholesterol level	59(56.2)	43(43.9)	102(50.2)	0.158
Diabetes	54(51.4)	49(50.0)	103(50.7)	0.332
Overweight	62(59.0)	34(34.7)	96(47.3)	0.002
Lack of physical exercise	69(65.7)	32(32.7)	101(49.8)	p <0.001
Heart diseases(MI or angina)	70(66.7)	42(42.9)	112(55.2)	0.003
Carotid stenosis	85(81.0)	51(52.0)	136(67.0)	p <0.001
Smoking	76(72.4)	51(52.0)	127(62.6)	0.009
Excessive alcohol consumption	64(61.0)	44(44.9)	108(53.2)	0.059
Irregularities in the heartbeat (AF)	68(64.8)	45(45.9)	113(55.7)	0.025
Blood diseases	41(39.0)	24(24.5)	65(32.0)	0.063
Small vessel diseases	58(55.2)	34(34.7)	92(45.3)	0.013
Age	51(48.6)	34(34.7)	85(41.9)	0.013
Sex	18(17.1)	9(9.2)	27(13.3)	0.023
Family history of stroke/TIA	62(59.0)	40(40.8)	102(50.2)	0.007
Suffering previousstroke/TIA	79(75.2)	47(48.0)	126(62.1)	p <0.001
Warning signs				
Numbness or weakness in the face	97(92.4)	87(88.8)	184(90.6)	0.521
Weakness one side of the body	101(96.2)	91(92.9)	192(94.6)	0.563
Trouble speaking	99(94.3)	82(83.7)	181(89.2)	0.047
Visual problems	67(63.8)	52(53.1)	119(58.6)	0.298
Severe headache	77(73.3)	54(55.1)	131(64.5)	0.015
Difficulty in walking, loss of balance or coordination	96(91.4)	82(83.7)	178(87.7)	0.183
Dispnea	41(39.0)	31(31.6)	72(35.5)	0.52
Nausea /vomiting	61(58.1)	33(33.7)	94(46.3)	0.002
Heart palpitations	54(51.4)	34(34.7)	88(43.3)	0.005

AF: Atrial fibrillation; TIA: Transient ischaemic attack.

Discussion

To our knowledge, the current study is the first to assess the awareness/knowledge of stroke risk factors and warning signs among caregivers of patients with and without stroke in Turkey. The primary objective was to assess the awareness/knowledge of stroke risk factors and warning signs among the primary caregivers. Since the study did not aim at developing a tool to measure the knowledge of stroke or its perception, therefore the validity or reliability the questionnaire was not vigorously tested.

The majority of group 1 caregivers had better knowledge of stroke warning signs and risk factors than group 2 caregivers. Compared to the findings of other studies,¹²⁻¹⁶ the knowledge level was extremely poor. The majority caregivers correctly identified brain as the affected organ in stroke. The knowledge regarding the organ injured in

stroke was better compared to some other studies.^{1,17}

The majority caregivers in the current study correctly answered weakness on one side of the body as a warning symptoms and hypertension as a risk factor for stroke. This is consistent with other studies.^{1,2,18,19} A study found that the most common warning sign of stroke listed by respondents was dizziness.² Another study revealed that 98.2% participants mentioned weakness and paralysis of one side of the body as the most common presentation in stroke.²⁰ Similarly, the most common symptom (62%) identified in a study was weakness of one side of the body.¹⁷

A number of sociodemographic factors were found to influence patients' knowledge about stroke risk factors; for example older age and lower educational level. Also, age >75 years negatively influenced patients' stroke knowledge level and low educational level had a negative

Table-4: Respondents' awareness with stroke prevention and Sources of information about stroke.

Respondents' awareness with stroke prevention	Caregivers of patient with stroke (n=105) n (%)	Caregivers of patient without stroke (n=98) n (%)	Total (n=203) n (%)	p value
Stroke can be prevent				
Yes	80(76.2)	66(67.3)	146(71.9)	0.372
Stroke prevention measures				
Regular doctor check	77(73.3)	60(61.2)	137(67.5)	0.125
Regular drug use	71(67.6)	47(48.0)	118(58.1)	0.012
Blood pressure control	72(68.6)	46(46.9)	118(58.1)	0.009
Appropriate nutrition	71(67.6)	46(47.4)	117(57.9)	0.023
Regular physical activity	74(70.5)	44(44.9)	118(58.1)	p <0.001
Avoid of stres	72(68.6)	48(49.0)	120(59.1)	0.010
Smoking cessation	68(64.8)	40(40.8)	108(53.2)	0.004
Restriction of alcohol consumption	63(60.0)	36(36.7)	99(48.8)	0.002
Providing ideal weight	67(63.8)	35(35.7)	102(50.2)	p <0.001
Sources of and taking information about stroke				
Taking information about stroke				
Yes	33(31.4)	11(11.2)	44(21.7)	
Source of information				
Television	15(14.3)	2(2.0)	17(8.4)	
Internet	10(9.5)	1(1.0)	11(5.4)	
Book	5(4.8)	0(0)	5(2.5)	
Newspaper	6(5.7)	0(0)	6(3.0)	
Relatives	12(11.4)	4(4.1)	16(7.9)	
Patient with stroke and theirrelatives	17(16.2)	5(5.1)	22(10.8)	
Subjects want to learn about stroke				
Early signs and symptoms	72(68.6)	60(61.2)	132(65.0)	
Risk factors	60(57.1)	53(54.1)	113(55.7)	
Preventive measures	75(71.4)	61(62.2)	136(67.0)	
First intervention things to do	61(58.1)	59(60.2)	120(59.1)	

effect.²¹ But we didn't find relationship between stroke knowledge and educational level and age. However, one study showed a positive relationship between stroke knowledge and higher education.²² There was no significant relation of awareness with residence, gender, social security and stroke risk status.¹ Education was found to be playing a significant role in predicting correct response.⁴ A study revealed that younger age, female gender, and higher education level were significantly associated with knowledge of stroke warnings.² In our study, 'patients with stroke and their relatives' was the most commonly cited source of information about stroke. A study found that the main sources of information about stroke were relatives (37.0%), television (31.1%), physicians (8.3%) and newspapers (8.1%).¹ Another study revealed that the most frequently named sources were newspapers (67%), television/radio (60%), and pharmacies and at the doctors' office (61%).²²

Community-based studies are required that may include both urban and rural populations to confirm the findings of the current study.

Conclusion

Caregivers had a moderate knowledge about some of the warning signs and risk factors of stroke. The caregiver must be educated. Also, attention should be given to home-based education programmes and to visits by health workers for people who have difficulty accessing healthcare services.

Disclaimer: None.

Conflict of Interest: None.

Source of Funding: None.

References

1. Evci ED, Memis S, Ergin F, Beser E.A population-based study on awareness of stroke in Turkey.Eur J Neurol 2007;14:517-22.
2. Pancioli AM, Broderick J, Kothari R, Brott T, Tuchfarber A, Miller R, et al.Public perception of stroke warning signs and knowledge of potential risk factors.JAMA 1998;279:1288-92.
3. Ince B, Necioglu D. Organization of stroke care in Turkey.Int J Stroke 2017;12:105-107.
4. Saad S, Waqar Z, Islam F, Iqbal H, Nomani AZ. The awareness of stroke in caregivers of stroke patients in Pakistan. J NeurolDisord

- 2017;5:2-4.
5. American Heart Association and American Stroke Association. Stroke Risk Factors.[Online] [Cited 2017 January 18].Available from http://www.strokeassociation.org/STROKEORG/AboutStroke/UnderstandingRisk/Understanding-Stroke-Risk_UCM_308539_SubHomePage.jsp
6. Duque AS, Fernandes L, Correia AF, Calvino I, Cardoso G, Pinto M, et al. Awareness of stroke risk factors and warning signs and attitude to acute stroke. *Int Arch Med* 2015;8:1-18.
7. Flemming KD, Brown RD Jr.Secondary prevention strategies in ischemic stroke: identification and optimal management of modifiable risk factors. *Mayo Clin Proc* 2004;79:1330-40.
8. Jauch EC, Saver JL, Adams HP Jr, Bruno A, Connors JJ, Demaerschalk BM, et al. Guidelines for the early management of patients with acute ischemic stroke: a guideline for healthcare professionals from the American Heart Association/American Stroke Association. *Stroke* 2013;44:870-947.
9. Mi T, Sun S, Du Y, Guo S, Cong L, Cao M, et al. Differences in the distribution of risk factors for stroke among the high-risk population in urban and rural areas of Eastern China. *Brain Behav* 2016;6:e00461.
10. National Stroke Association. Stroke prevention. [Online] [Cited 2017 January 18].Available from [URL:http://www.stroke.org/sites/default/files/resources/prevention-brochure-2015.pdf](http://www.stroke.org/sites/default/files/resources/prevention-brochure-2015.pdf).
11. Robinson TG, Reid A, Haunton VJ, Wilson A, Naylor AR.The face arm speech test: does it encourage rapid recognition of important stroke warning symptoms? *Emerg Med J* 2013;30:467-71.
12. Sloma A, Backlund LG, Strender LE, Skånér Y.Knowledge of stroke risk factors among primary care patients with previous stroke or TIA: a questionnaire study. *BMC Fam Pract* 2010;11:47.
13. Croquelois A, Bogousslavsky J.Risk awareness and knowledge of patients with stroke: results of a questionnaire survey 3 months after stroke. *J Neurol Neurosurg Psychiatry* 2006;77:726-8.
14. Gill R, Chow CM.Knowledge of heart disease and stroke among cardiology inpatients and outpatients in a Canadian inner-city urban hospital. *Can J Cardiol* 2010;26:537-40.
15. Gupta A,Thomas P.General perception of stroke. Knowledge of stroke is lacking. *BMJ* 2002;325:392.
16. Hickey A, O'Hanlon A, McGee H, Donnellan C, Shelley E, Horgan F, et al. Stroke awareness in the general population: knowledge of stroke risk factors and warning signs in older adults. *BMC Geriatr* 2009;9:35.
17. Pandian JD, Jaison A, Deepak SS, Kalra G, Shamsher S, Lincoln DJ, et al.Public awareness of warning symptoms, risk factors, and treatment of stroke in northwest India. *Stroke* 2005;36:644-8.
18. Akinyemi RO, Ogah OS, Ogundipe RF, Oyesola OA, Oyadoke AA, Ogunlana MO, et al.Knowledge and perception of stroke amongst hospital workers in an African community. *Eur J Neurol* 2009;16:998-1003.
19. Stroebele N, Müller-Riemenschneider F, Nolte CH, Müller-Nordhorn J, Bockelbrink A, Willich SN.Knowledge of risk factors, and warning signs of stroke: a systematic review from a gender perspective. *Int J Stroke* 2011;6:60-6.
20. MonalizaMA, Srivastava A. Awareness of risk factors and warning symptoms of stroke in general population. *Nursing & midwifery research journal* 2012;8:149-60.
21. Zeng Y, He GP, Yi GH, Huang YJ, Zhang QH, He LL.Knowledge of stroke warning signs and risk factors among patients with previous stroke or TIA in China. *J Clin Nurs* 2012;21:2886-95.
22. Marx JJ, Gube C, Faldum A, Kuntze H, Nedelmann M, Haertle B, et al. An educational multimedia campaign improves stroke knowledge and risk perception in different stroke risk groups. *Eur J Neurol* 2009;16:612-8.