


# Knowledge, attitude, and practice regarding stroke potential complications among stroke survivors' family members in Shiraz, Iran

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## ABSTRACT

**Objectives:** This study aimed to evaluate stroke survivors' family members' knowledge, attitude, and practice about these sequelae.

**Patients and methods:** In this cross-sectional survey, 105 family members (57 males, 48 females; mean age: 48.3±9.7 years; range 18 to 60 years) of stroke survivors were examined via a self-structured questionnaire between September 2019 and January 2020. Patients' medical characteristics, as well as participants' sociodemographic and opinions regarding studying variables, were surveyed.

**Results:** The participants were mostly married and had relatively high scores in knowledge, attitude, and practice questionnaires. We found a significant correlation between participants' knowledge and practice. Moreover, data analysis revealed significantly higher knowledge scores in the employed participants and higher practice scores in the urban population. Furthermore, the relationship of patients with their family members can affect their attitude toward stroke complications.

**Conclusion:** This study has revealed that caregivers in rural areas with lower education levels are less knowledgeable about potential stroke complications, and subsequently, the patients are more vulnerable to those sequelae. Stakeholders should consider these groups their priorities in education and empowerment processes for stroke survivors' caregivers.

**Keywords:** Attitude, caregiver, knowledge, practice, rehabilitation, stroke.

Stroke is defined as the central nervous system cell death attributable to ischemia, based on neuropathological, neuroimaging, or clinical evidence of permanent injury.<sup>[1]</sup> It is a major global concern due to its vast prevalence, mortality, and life-lasting complications. According to the World Health Organization, cerebrovascular accident (CVA) is the second leading cause of death and the third leading cause of disability worldwide.<sup>[2]</sup> The global prevalence of stroke was estimated at around 104.2 million people, and 6.2 million deaths were attributed to CVA

worldwide in 2017.<sup>[3]</sup> Despite encouraging data about declining stroke incidence, the aging population and accumulating risk factors contribute to an increased lifetime risk of stroke on a global level.<sup>[4]</sup>

Cerebrovascular accidents can lead to several disabling medical situations in both the short and long term. Seizures, deep vein thrombosis, pulmonary embolism, urinary infection, bowel dysfunction, aspiration pneumonia, decubitus ulcers, and constipation are among the most common short-term poststroke complications. In addition, long-term

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sequelae include pain syndromes, pseudobulbar affect, depression and anxiety, cognitive impairment and dementia, epilepsy, gait instability and motor impairment, and fractures followed by repeated falls and osteoporosis.<sup>[4-6]</sup> Moreover, stroke is among common etiologies of dysphagia, which may aggravate other sequels like pneumonia and depression.<sup>[7]</sup> Secondary stroke complications can increase hospital stay, delay recovery, and even increase mortality. It also imposes an economic and social burden on the patients, their families, and the health system.<sup>[5]</sup> Rehabilitative therapy after stroke is essential for optimizing the outcome in the three principles of recovery: adaptation, restitution, and neuroplasticity.<sup>[8]</sup>

The stroke burden cannot be diminished without sufficient public knowledge and the right attitude and practices regarding different aspects of CVA.<sup>[9]</sup> In addition, a previous study has suggested that lack of knowledge of stroke's risk factors, symptoms are the possible causes of unfavorable outcomes.<sup>[10]</sup> Stroke survivors' and their family members' awareness and attitude may affect their practices towards stroke complications and can play a nonnegligible role in the path of rehabilitation and prevent or minimize the occurrence of sequelae.<sup>[11,12]</sup> In this survey, we aimed to assess the knowledge, attitude, and practice among stroke survivors' family members in Shiraz, Iran.

## PATIENTS AND METHODS

This cross-sectional survey was conducted from September 2019 to January 2020 at the Motahari Clinic Hospitals in Shiraz, Iran. Through the convenience sampling technique, 105 family members (57 males, 48 females; mean age: 48.3±9.7 years; range 18 to 60 years) of stroke patients were enrolled in the study after applying the eligibility criteria. Patients' relatives were surveyed if they lived with the patients, the diagnosis of the patients had been confirmed, and at least two weeks had passed from the stroke. Participants with poor cooperation ability were excluded.

A self-structured questionnaire was developed by a panel of medical professionals (two psychiatrists, one physiotherapist, and one neurologist). The data collection instrument contained five sections. Section A included respondents' socio-demographic characteristics: age, sex, their relationship with the patients, marital status, education level, employment status, and place of residency. Section B involved patients' clinical variables: the type of stroke, comorbidities, complications, mental disorders,

treatment, assistive devices (e.g., wheelchairs), and physical companionship. In sections C, D, and E, participants' knowledge, attitude, and practice regarding stroke complications were assessed via a 3-point Likert scale (disagree, uncertain, and agree) through 12, 9, and 14 questions, respectively. Each positive answer was awarded 2 points, and uncertain answers were given 1 point. Negative responses yielded a score of 0. Negative questions were scored contrariwise. The questionnaire's validity was assessed in terms of comprehensibility, clarity, and grammatical structure by the research panel. The questionnaires were filled in by a researcher. No attempt was made to prompt the respondents by suggesting answers.

## Statistical analysis

All analyzes was performed using IBM SPSS version 21.0 (IBM Corp., Armonk, NY, USA). Descriptive statistics were expressed as the mean and standard deviation. Pearson's correlation coefficient or its nonparametric equivalent was used to find any relationship between attitude, knowledge, and practice and determine the relation of age with the mentioned variables. The independent samples t-test or its nonparametric equivalent, the Mann-Whitney U test, was used to statistically analyze the effect of participants' demographic variables, including sex, relation, marital status, employment, and residency, on the score of knowledge, attitude, and practice. One-way analysis of variance or the Kruskal-Wallis test was recruited to analyze the relationship between participants' knowledge, attitude, and practice and their education level. A *p* value of <0.05 was considered statistically significant.

## RESULTS

The participants' mean age was 48.3±9.7 years, and the majority of them, 57 (54.8%) were male and married 85 (86.7%). Among 82 (78.1%) respondents who declared their relation to the patients, 48 (45.7%) were the patients' children, 30 (28.6%) were spouses, and four (3.8%) were siblings. Twenty-one (20.2%) were illiterate or had under diploma education, 26 (25%) had high school diplomas, and 57 (54.8%) had undergraduate degrees. Twenty-eight (63.6%) were employed, 16 (36.4%) were unemployed, and 40 did not answer. Thirty-six (55.4%) participants lived in an urban area while 29 (44.6%) in a rural area.

Patients stayed at a hospital for about nine days for a mean of 8.9±8.6 days, although ranging from 1 to 55 days in different cases. Ischemic stroke was diagnosed in 66 (79.5%) patients, 17 (20.5%) had a

hemorrhagic form, 13 (14.8%) were surgically treated, and 75 (85.2%) underwent nonsurgical therapies. Assistive devices were used in 24 (23.3%) patients, while 79 (76.7%) did not require assistive devices.

The most common complication was urinary dysfunction, which was reported in 81 (77.1%) patients, followed by pain disorders (n=63, 60%), bedsores (n=34, 32.4%), gastrointestinal problems (n=33, 31.4%), respiratory dysfunctions (n=22, 20.9%), osteoporosis (n=22, 20.9%), joint stiffness (n=19, 18.1%),

cardiovascular diseases (n=10, 9.6%), spasticity (n=8, 7.7%), and fractures (n=4, 3.9%). Moreover, the respondents described the patients' mental status as depressed in 54 (51.5%), aggressive in 10 (9.5%), and worried in four (3.8%) cases.

Participants' mean scores were 15.52±2.98, 14.05±2.03, 19.07±2.34 in the knowledge, the attitude, and the practice questionnaires, respectively. Detailed answers to each question are presented in Tables 1, 2, and 3.

**TABLE 1**  
Participants' knowledge regarding stroke

	No		Uncertain		Yes		Unanswered	
	n	%	n	%	n	%	n	%
1 Immobility causes bowel dysfunction.	12	11.4	32	30.5	61	58.1	0	0
2 Immobility may cause osteoporosis.	14	13.3	40	38.1	51	48.6	0	0
3 Immobility may cause urinary tract infections.	2	1.9	5	4.8	97	92.4	1	1
4 Immobility may cause deep venous thrombosis of the legs.	37	35.2	37	35.2	31	29.5	0	0
5 Immobility may cause depression and mood changes.	3	2.9	12	11.4	89	84.8	1	1
6 It is necessary to move the joints daily to prevent stiffness and joint contracture.	4	3.8	38	36.2	60	57.1	3	2.9
7 Breathing exercises reduce the risk of respiratory infections.	45	42.9	45	42.9	13	12.4	2	1.9
8 Do you know about shoulder pain and related problems after a stroke?	93	88.6	12	11.4	0	0	0	0
9 I know the symptoms of a urinary tract infections.	1	1	17	16.2	87	82.9	0	0
10 Immobility may cause bladder and kidney stones.	17	16.2	60	57.1	28	26.7	0	0
11 Do you know about the importance of talking and communication?	7	6.7	57	54.3	41	39	0	0
12 Are you aware of different ways of feeding?	14	13.3	26	24.8	65	61.9	0	0

**TABLE 2**  
Participants' attitude regarding stroke

	No		Uncertain		Yes		Unanswered	
	n	%	n	%	n	%	n	%
1 Do you think rehabilitation can improve the patient's quality of life?	11	10.5	11	10.5	83	79	0	0
2 Do you consider rehabilitation necessary in the treatment process?	11	10.5	4	3.8	90	85.7	0	0
3 Are you aware of the importance of the complications of the stroke?	3	2.9	9	8.6	91	86.7	2	1.9
4 Is it intolerable to follow up and take care to prevent the potential complications?	5	4.8	24	22.9	73	69.5	3	2.9
5 Social media can provide reliable information about the illness.	36	34.3	46	43.8	23	21.9	0	0
6 We are honest about our requests and concerns about medical care.	3	2.9	14	13.3	88	83.8	0	0
7 Do you think the patient has received any proper treatment to reduce neuromuscular pain?	0	0	39	37.1	66	62.9	0	0
8 Do you think the patient's condition has disrupted his/her marriage and sexual function?	41	39	28	26.7	36	34.3	0	0
9 Do you think the patient is interested in learning about potential complications of the injury and self-care?	0	0	19	18.1	84	80	2	1.9

**TABLE 3**  
Participants' practice regarding stroke

		No		Uncertain		Yes		Unanswered	
		n	%	n	%	n	%	n	%
1	Do you use the internet to find out about your patient's illness?	33	31.4	38	36.2	33	31.4	1	1
2	Are you in contact with other stroke patients?	70	66.7	4	3.8	31	29.5	0	0
3	Have you adapted your home appliances and equipment to the patient's situation?	10	9.5	58	55.2	37	35.2	0	0
4	I usually check the skin for any sign of redness or possible soreness.	0	0	20	19	81	77.1	4	3.8
5	The patient drinks one to two liters of fluids every day.	61	58.1	41	39	3	2.9	0	0
6	I will request a urine test if the odor or color of the urine changes.	0	0	3	2.9	102	97.1	0	0
7	Prescribed medications are taken regularly.	0	0	1	1	103	98.1	1	1
8	I/ the patient move/s the body on wheelchair or bed every 2 hours.	7	6.7	60	57.1	38	36.2	0	0
9	In case of inconstancy, I/ the patient am/ is careful about the perineal skin sensitivity.	1	1	28	26.7	76	72.4	0	0
10	I/ the patient move/s the joints several times a day to prevent stiffness and contractures.	0	0	45	42.9	57	54.3	3	2.9
11	I will visit a doctor if the patient has any physical problem.	1	1	2	1.9	95	90.5	7	6.7
12	The patient will use more fluids, fibers, or laxatives in the case of constipation.	3	2.9	14	13.3	84	80	4	3.8
13	Do you use the Internet to find out about your illness?	65	61.9	30	28.6	5	4.8	5	4.8
14	The patient tries to walk every day to prevent osteoporosis.	20	19	21	20	64	64	0	0

A significant correlation was found between participants' knowledge and practice ( $r=0.273$ ,  $p=0.016$ ). Data analysis has revealed that employed participants got a higher score in the knowledge questionnaire compared to jobless individuals ( $p=0.041$ ). Furthermore, the urban population had statistically significantly higher practice scores ( $p=0.019$ ). No significant relation between participants' sex or marital status, educational level and knowledge, attitude, and practice scores was found, though relation was correlated with attitude score ( $p=0.042$ ), meaning that patients' spouses, children, and siblings had respectively higher scores in attitude questionnaire.

## DISCUSSION

Cerebrovascular accidents are a significant cause of dysfunction due to their high prevalence and lifelong disabling complications. Early intervention therapies can avoid overwhelming complications as well as accelerate the rehabilitation and recovery progress. Consequently, various treatment strategies with different targets may be needed. For example, muscular spasticity and motor recovery are both connected with neural plasticity, but they are

treated through different mechanisms. Previous studies have suggested a relation between muscular rehabilitative therapies and neural recovery.<sup>[5,13-15]</sup> Therefore, stroke survivors should be aware of this phenomenon to avoid life-long symptoms and sequelae of CVA.

Stroke survivors are mostly dependent on their relatives or must take help from others for their basic daily living routines. Caregivers' knowledge, attitude, and practical behaviors can play a crucial role in the path to rehabilitation.<sup>[16]</sup> To the best of our knowledge, few studies have been conducted to survey these parameters in the stroke patients' family members as main caregivers regarding this issue.<sup>[9,17]</sup>

Participants' mean knowledge and attitude scores were around 15.5 out of 24 and 14 out of 18, respectively. In addition, they got about 19 scores from 28 scores in practice surveys, indicating that participants' attitudes considering the CVA are at a desirable level and higher from their knowledge and practice; however, the overall scores in these parameters are relatively acceptable, which may be due to the targeted population. A previous study from India also showed that knowledge and awareness

are significantly higher in stroke-affected families compared to unaffected families.<sup>[9]</sup>

The correlation we found between knowledge and practice scores is consistent with the findings of a Canadian study, which revealed an interrelationship between stroke-related beliefs and behaviors in two groups of European and Chinese Canadian population; in other words, higher knowledge about a subject is followed by higher practical actions.<sup>[18]</sup>

Attitude may vary in different age groups. In this study, older participants seem to have higher rates of attitude toward stroke complications, and considering the participants' mean age (48.3±9.7 years), this may be due to the more excellent companionship and having lower age differences and sympathy with the stroke survivors.

People's career may influence their knowledge in several manners. In this study, employed individuals got statistically significantly higher scores in the knowledge part of questionnaires. Except for those who work in the health care settings who are already familiar, many employees should take occupational health consultations and may get some health-related information during the check-ups. Meanwhile, this finding might not be epidemiologically significant.

Living in urban areas were matched with better practices in this study. We did not find any significant relationship between participants' knowledge and their education or living place, though the practice reflects people's knowledge. A cohort study has shown a significant association between educational level and knowledge regarding some aspects of stroke in hospitalized patients in Vienna,<sup>[19]</sup> though in our study, no significant relationship was found regarding this issue, which may be owing to the small sample size. Furthermore, there is a controversy regarding knowledge in urban versus rural areas. Although rural and semi-urban regions performed better than the urban population in Góngora-Rivera et al.'s<sup>[20]</sup> study, Kaddumukasa et al.<sup>[21]</sup> found that individuals residing in a rural setting were most likely to be poorly informed about stroke.

In this study, we found an interesting relationship between the relation of caregiver and their attitude toward stroke complications. Spouses were the most concerned caregiver, followed by patients' children and siblings. Based on our knowledge, there is no such finding in the literature. However, previous studies have focused on the critical and challenging role of a

spouse as a caregiver of stroke survivors and different contexts of these relationships.<sup>[22,23]</sup>

Since most stroke complications can be evitable, stroke survivors' caregivers' practice should be taken into account. As previous studies have shown, educating this population can dramatically impact both patients' and caregivers' quality of life. Constant education programs through telemedicine, as well as sufficient education during the discharge period, are recommended.<sup>[24-27]</sup>

The limitations of this study are its limited population of different ages, educational levels, and ethnicities. More homogenous study groups could result in more specific information for each targeted group. Although all the respondents had entered the study of their own volition, some of them were not cooperative, resulting in missing data in some variables. Most of the participants were the relatives of stroke survivors who had experienced a CVA in the last two years and did not have long-term complications like osteoporosis; therefore, future studies on these individuals are recommended.

In conclusion, this study has revealed that caregivers in rural areas with lower education levels are less knowledgeable about stroke's potential complications, and subsequently, the patients are more vulnerable to those sequelae. Stakeholders should consider these groups their priorities in education and empowerment processes for stroke survivors' caregivers. Further homogenous studies on each subgroup of this survey would be suggested.

**Ethics Committee Approval:** The study protocol was approved by the Shiraz University of Medical Sciences Ethics Committee (IR.SUMS.MED.REC.1399.006, 25.03.2020). The study was conducted in accordance with the principles of the Declaration of Helsinki.

**Patient Consent for Publication:** A written informed consent was obtained from each patient.

**Data Sharing Statement:** The data that support the findings of this study are available from the corresponding author upon reasonable request.

**Author Contributions:** Designed the study, revised it critically: H.F.; Gathered the data: F.E., S.M.; Analyzed the data: A.M.; Drafted the manuscript: A.M., F.E., S.F.

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