Original Article

Factors Influencing Stroke Knowledge among Thai Rural Population

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Objective: Stroke is the third leading cause of death in Thailand having devastating effects on patients and families. About half of stroke patients in Thailand live in rural areas where accessing to health care services and information is difficult. To reduce the incidence of stroke, public stroke awareness is critical. Therefore, this study aimed to determine the factors affecting stroke knowledge in Thai rural people.

Materials and Methods: A study was conducted among 579 people who live in a rural area (Khao Suan Kwang District, Khon Kaen, Thailand). All participants were asked to complete the questionnaire which consisted of (1) demographic data (2) 19 items regarding stroke risk factors (3) 11 items of signs and symptoms of stroke including warning signs and (4) management after a stroke attack.

Results: The majority of participants (79%) were females, with a mean age 49 (SD 16) years. Most participants recognized stroke risk factors, signs and symptoms and warning signs. Of these participants, 70% had excellent stroke knowledge. Only 16% knew to call 1669, the emergency call number in response to stroke symptoms. In multivariate analysis, age (more than 40 years old), females, working status and incomes showed a positive association with excellent stroke knowledge.

Conclusion: The present study suggested young, male, and unemployed participants were associated with a deficit in stroke knowledge in rural areas. Therefore, an education campaign should be conducted in rural areas particularly among males and young people.

Keywords: Stroke knowledge, Risk factor, Warning sign

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Stroke is a cause of disability and loss of ability to conduct one's daily life. The patient becomes a family burden and expenses increase for clinical treatment and home care. The number of stroke patients rose every year. In 2004, the disease accounted for 94,567 patients in Thailand outside of Bangkok. A report from the health surveillance survey in 2007 revealed 398,483 totally diagnosed as having stroke. Of this number, new patients were assumed to be a ratio 3: 1 to old patients. When compared to 2009, patients all over Thailand excluding Bangkok rose to 131,203 cases/year and the 4th cause of death. Information from Thailand's Association of Neurology indicated that the average age of patients with palsy and paralysis was 50 years, a lower age than in other developed countries such as New Zealand where people started to have palsy or paralysis at 65 years. Therefore, Thai people lose

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workability before the right time, and the length of illness is longer. The DALY rate increased from 9.0 in 1999 to 10.9 in 2006[1,2]. The cost of treatment was estimated at 100,000-1,000,000 baht/patient/year in Thailand. Care for new stroke patients amounted to nearly 30,000 million baht/year. These data denoted severity of the palsy and paralysis problem, the level of the problem, early loss of workability, and a longer time of being sick which means increased expenses and burden for patient care.

Educating people about stroke should be an effective way to prevent both social and economic impact that entails. At present, treatment of stroke is done by giving thrombolytic drug, which is effective if the patient receives the drug within the first 4.5 hours after the first symptoms[3]. Only a few cases, however, arrive at the hospital in time[4]. Rural people take a long time to reach a doctor. Therefore, knowledge of symptoms, medical signs and warning signs of stroke should help in sending patients to clinical services in time. A study by Aekplakorn et al[5] showed that women in rural areas had a higher chance of metabolic syndrome than urban people. This condition is a risk factor of stroke. Besides, Wattanapan[6] found that only 43 percent of stroke patients treated at Srinagarind Hospital (a tertiary university hospital in the Northeast of Thailand) had correct knowledge of stroke risk factors. Pansombat[7] showed that roughly 20 percent of stroke patients treated at Chulalongkorn University (a tertiary university hospital in Bangkok, the capital of Thailand) knew the risk factors of stroke. This shows that people living in different areas are not equally informed of stroke. Therefore, the researchers were interested to conduct a study on stroke in a rural area for future health promotion and disease prevention.

Materials and Methods

The present study was conducted on people living in a rural area of Na-ngew Sub-district, Khao Suan Kwang District, Khon Kaen from November to December 2010. The population aged 18 years and over who could speak Thai and could answer all questions were explained their role in project participation before giving consent to participate in the research. All participants were evaluated on their knowledge of stroke by using the questionnaire which consisted of 2 parts. Part 1 asked demographic information: gender, age, educational level, occupation, and health information such as history, congenital disease, smoking history, and exercising. Part 2 assessed knowledge and practices of stroke in 38 questions. Nineteen questions were on risk factors, 11 on symptoms and signs, and 8 questions on knowledge of stroke and practices. The questionnaire was checked by 2 neurologists and tested with 20 people who did not participate in the research. This study was received the approval of the ethic committee of the Khon Kaen university, Thailand.

The data were analyzed by SPSS version 19. Descriptive statistics were computed in percentages, means, and standard deviations. The scores of each topic (risk factors, symptoms and warning signs, and practices) were designated as passing (over 40%) and not passing (below 40%). If a participant passed every topic, his knowledge was rated as excellent. The association between factors and knowledge of each topic was analyzed by means of chi-square test for bivariate analysis. Variables that were found significant on bivariate analysis were inserted in to multivariable analysis. Multiple logistic regression analysis was used to assess the factors for stroke knowledge with a significance level of $p<0.05$.

Results

The total number of participants was 579, most of whom were females (79%). The average age was 49 years (SD = 16). Ninety-two percent had not had a stroke before and most participants denied having underlying diseases such as diabetes, hypertension, and atrial fibrillation. Their educational levels, incomes and occupations are shown in Table 1. It was found that only 13 percent still smoked.

Knowledge of stroke

Seventy-nine percent of the participants showed an excellent level of knowledge of stroke. Those who passed the over 40% level in each domain for the 4 domains (risk factors knowledge, symptoms and warning signs knowledge, knowledge of stroke, and practices knowledge) amounted to 92.7, 89.5, 95, and 93.1 percent. Although these scores look high, only 50 percent knew that lifestyles and high blood cholesterol are risk factors. Moreover, only 76.5 percent knew that smoking is a risk factor of stroke. The most participants (79%) did not recognize speech problem, unable to understand word and utterance, as the warning signs of stroke, whereas 25.6 percent still believed chest pain was a symptom of stroke.

Factors affecting knowledge of stroke

It was found that in general, age and employment correlated to overall knowledge, risk factor

Table 1. Demographic data of participants (n = 579)

Characteristic	Number (%)
Age (year)	
<40 years	166 (28.7)
≥40 years	413 (71.3)
Income (Baht)/month/person	
<5,000	430 (74.3)
5,000 to 9,999	106 (18.3)
≥10,000	43 (7.4)
Educational level	
Primary school	557 (96.2)
Higher than primary school	22 (3.8)
Occupation	
Unemployed	124 (21.4)
Employed	455 (78.6)

knowledge, and symptoms and warning signs knowledge. Incomes correlated to overall knowledge and symptoms and warning signs knowledge. Gender was significantly associated to risk factors knowledge ($p<0.05$). No correlation was found between existence of stroke risk factors, family members having a stroke, and educational level with knowledge of stroke (Table 2). When variables associated with knowledge of each topic were analyzed by multivariate logistic regression, it was found that female, age over 40 and those being employed had significantly more excellent knowledge than others in overall score, risk factor knowledge and symptoms and warning signs knowledge (Table 3). Only 16.4 percent, however, knew they should call 1669 when seeing a person showing a stroke symptom, while 44.9 percent would send the patient to hospital at once. There were no factors significantly correlated to this.

Discussion

Generally speaking, this survey found that people living in rural areas had an average to good knowledge of stroke. Females outdid males, and those over 40 years of age outdid those younger in terms of overall knowledge, risk factor knowledge and symptoms and warning signs knowledge.

These findings agree with studies by Neau[8], Blades[9], and Marx[10] who reported that females knew more than males about stroke. This was due to the fact that media presenting information related to stroke are social media such as television, radio, brochures, or posters. Females are usually more interested in these kinds of things and remember them better. Males, owing to their work outside households, are less exposed to the information.

People over the age of 40 knew more than younger people. A study by Falaviga[11] also found people over 50 years of age knew better than the younger generation about stroke risk factors. Previous studies[12-14] revealed that the middle aged group had a greater knowledge of stroke than younger and older age groups since they are at the age mostly subject to stroke, and hence become more interested in the disease and prevention. People of older age groups are also the campaign target of disease prevention and are educated and informed on how to look after oneself and prevent the disease. This contrasts, however, to some studies[15-17] that reported that older age ranges from 65, 70, and 75 years shows lower score, possibly owing to different age-range cutoffs. The present study was based on an average age of 49 years, which was relatively lower than other studies, resulting in varied results.

Besides age and gender, Blades[9] found that educational levels higher than primary level and high blood cholesterol had an effect on knowledge of warning signs of stroke. Falaviga[11] showed that the group with high education knew better in terms of stroke warning signs. The present study did not find the statistical relationship since most of the participants only completed a primary level of education. Nevertheless, educating media used in campaigns should be appropriate to people's knowledge levels and their perception of news and information.

With reference to practices and management when seeing someone showing stroke symptoms, it was found that only 16 percent realized they had to call 1669. This proportion is really low compared to other previous studies[9,18,19] in which 60 to 70 percent made the call. By gender, 16.4 percent of females and 16.5 percent of males would make this emergency call. This differs from a study by Marx[10] who found that 33.3 percent of females recalled the emergency number for stroke patients correctly, and 87.2 percent said they would call an emergency unit if seeing a person having symptoms. Barr's study, however, revealed that men arrived at a hospital sooner than women[20] and hence women received thrombolytic drug at a later stage than men[21]. It was also found that arrival by an emergency van means the patient receives the drug sooner. Therefore, knowledge related to the use of the emergency call should be disseminated to improve the chances of immediate treatment.

In conclusion, the present study found that men aged lower than 40 years and unemployed had a low level of stroke knowledge. These groups, men and

Table 2. Relationship between variables and total knowledge score, risk factors, and symptoms and warning signs

Variables	Overall		Risk factors		Symptoms and warning signs	
	Number (%)	*p*-value	Number (%)	*p*-value	Number (%)	*p*-value
Gender						
Female	368 (80.6)	0.060	431 (94.3)	0.004*	415 (90.6)	0.080
Male	88 (72.7)		105 (86.8)		103 (85.1)	
Age						
<40	112 (67.5)	<0.001*	147 (88.6)	0.014*	133 (80.1)	<0.001*
≥40	345 (83.5)		390 (94.4)		385 (93.2)	
Education level+						
Primary	439 (78.8)	1.000	516 (92.6)	1.000	500 (89.8)	0.275
Higher than primary	18 (81.8)		21 (95.5)		18 (81.8)	
Occupation						
Unemployed	85 (68.6)		108 (87.1)		101 (81.5)	
Employed	372 (81.8)	0.001*	429 (94.3)	0.006*	417 (91.7)	0.001*
Income						
<5,000	314 (79.1)	0.042*	371 (93.5)	0.146	359 (90.4)	0.032*
5,000 to 9,999	87 (85.3)		96 (94.1)		94 (92.2)	
≥10,000	56 (70.0)		70 (87.5)		65 (81.3)	
Have stroke risk factors						
Yes	244 (77.7)	0.432	291 (92.7)	0.943	276 (87.9)	0.181
No	213 (80.4)		246 (92.8)		242 (91.3)	
Family history of stroke+						
No	430 (78.8)	0.482	505 (92.5)	0.254	487 (89.2)	0.347
Yes	25 (86.2)		29 (100.0)		28 (96.6)	
Previous stroke+						
No	442 (78.7)	1.000	521 (92.7)	1.000	503 (89.5)	0.638
Yes	11 (84.6)		12 (92.3)		11 (84.6)	

* Statistical significant at *p*-value <0.05; + Analysis based on Fisher Exact's test

Table 3. Odd ratio (95% CI)[a] of factors by overall knowledge, risk factors and warning signs

Variables	Overall knowledge	Risk factors	Symptoms and warning signs
Gender			
Male	1.00	1.00	1.00
Female	1.91 (1.17 to 3.11)*	3.20 (1.55 to 6.59)*	2.37 (1.22 to 4.61)*
Age			
<40	1.00	1.00	1.00
≥40	2.67 (1.73 to 4.13)*	2.29 (1.15 to 4.56)*	3.49 (1.94 to 6.25)*
Occupation			
Unemployed	1.00	1.00	1.00
Employed	2.15 (1.34 to 3.44)*	2.74 (1.36 to 5.48)*	2.70 (1.48 to 4.92)*
Income			
≥10,000	1.00	1.00	1.00
5,000 to 9,999	2.34 (1.09 to 4.99)	2.07 (0.68 to 6.25)	2.43 (0.92 to 6.37)
<5,000	1.46 (0.83 to 2.57)	1.89 (0.83 to 4.27)	1.85 (0.92 to 3.73)

* Statistical significant at *p*-value <0.05; [a] Using multiple logistic regression

unemployed, are subject to a high risk of developing stroke. Hanchaiphiboolkul[22] reported that men have twice more risk of developing stroke than women at all age levels. Those being unemployed were shown to have a higher prevalence of stroke. Therefore, public health should accelerate educating people, in particular men and unemployed, on stroke and campaigning stroke prevention intensively.

In the present study, knowledge of stroke was assessed but not the practices of what to do when having a stroke. The questions used were close-ended questions, resulting in higher chances to get correct answers than open-ended questions. Moreover, no information was found with reference to the source of where knowledge of stroke survey participants was obtained. If all of these topics were evaluated, a better idea of sources would be obtained as to where information related to practices and true knowledge of the population came from. The sources of knowledge would enable more effective dissemination of information.

Conclusion

The present study suggested that young, male, and unemployed participants were associated with a deficit in stroke knowledge in rural areas. Therefore, an education campaign should be conducted in rural areas particularly among males and young people in general.

What is already known on this topic?

Thai people living in different areas are not equally informed of stroke.

What this study adds?

The present study suggested young, male, and unemployed participants were associated with a deficit in stroke knowledge in rural areas.

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Potential conflicts of interest

The authors declare no conflict of interest.

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