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Research Article

**KNOWLEDGE, ATTITUDES AND PERCEPTIONS OF STROKE
AMONG THE COMMUNITY: A CROSS-SECTIONAL SURVEY
IN TABUK CITY, SAUDI ARABIA**¹Ahmed Yassin Alrefaei, ²Ahmed Hussain Alshaikhi, ³Waled Mohammed Albalawi,
⁴Abdulaziz Saad Alharthi, ⁵Khalid Mohammed Albalawi.**Abstract:**

Background: The overall global burden of stroke or cerebrovascular accident in Saudi Arabia is great and increasing. The community knowledge of stroke symptoms has an effect on early recognition and thereby the mortality and morbidity rates.

Objective: The aim of this study was to assess the knowledge and attitude of the community about stroke risk factors and symptoms in Tabuk city, Saudi Arabia.

Methods: In this cross sectional study, questionnaires were distributed on a random sample from the population of Tabuk city after obtaining an informed consent. A total of 350 study participants were enrolled into this study.

Results: Two hundred and thirty six (67.4%) of participants were females with a median age (IQR) of 29 (21–40) years. More than half (52.3%) of the participants correctly identified stroke as a disorder of the brain. Two hundred and seventy two subjects (77.7 %) knew at least one risk factor for stroke, and 44.5% of them identified that a combination of hypertension, atherosclerosis, obesity and smoking are stroke risk factors. Most of participants (74.0%) knew warning signs of stroke. Analysis of factors associated with knowledge of one or more warning signs revealed only a significant relationship with the knowledge of stroke risk factors ($p > 0.05$). Nearly half (55.1%) of the participants showed a positive attitude of rapid seeking of medical help by going to hospital either at once or after calling general practitioner or family physician.

Conclusion: There was a lack of knowledge about the organ affected and warning signs of stroke. Also, the proper attitude in cases of stroke was not clear to all participants. This requires more awareness strategies including health education by specialists.

Keywords: stroke; cerebrovascular accident; survey; knowledge; attitude; perception; Saudi Arabia.

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INTRODUCTION:

A stroke involves the rapid loss of brain function caused by either ischemic or hemorrhagic disorder of blood supply to the brain [1]. It is a common worldwide disease that frequently results in death or serious, permanent neurologic disabilities [2].

Stroke can result in mood disturbance, functional and cognitive dysfunctions, and poor quality of life [3]. Consequently a great financial and psychological burden among the individuals and caregivers was recognized by Das et al. [4].

Stroke is a multifactorial disorder. Non-modifiable risk factors include old age and positive family history, whereas modifiable risks include diabetes mellitus, hypertension, atherosclerosis, and heart diseases. Besides, alcohol dependence and smoking are common modifiable hazards for stroke [5].

Effective management of stroke requires very rapid intervention using thrombolytic therapies within the first four hours of stroke signs. This could reverse the paralysis in most of patients. However, most of patients arrive late after this golden time [6, 7]. The presence of adequate public general knowledge about stroke warning signs could result in a quick identification of stroke, rapid intervention, and favorable outcomes [8]. Moreover, primary preventive measures including lifestyle modifications and control of chronic co-morbidities are principal effective measures of stroke management [9].

The reported prevalence of stroke is lower in Saudi Arabia compared to Western and Asian countries [10]. However, a more recent research recognized stroke as a rapidly growing health problem in Saudi Arabia constituting an important cause of illness and death [11]. This emphasizes the need for evaluation of the existing awareness in the community about this disorder. Therefore, the goal of this study was to evaluate the knowledge, attitudes, and perceptions of Saudi subjects residing in Tabuk city regarding risk factors and warning signs for stroke.

METHODS:

Study design, settings, and ethical considerations:

A cross sectional study was conducted in Tabuk city that is located in north western area of Saudi Arabia. The study was conducted according to the ethical principles of medical research developed by the World Medical Association Declaration of Helsinki. An approval was obtained from the Research Committee, Faculty of Medicine, University of Tabuk. A written informed consent was obtained from each participant included in the study.

Sample size and study population:

The sample size was calculated as 342 subjects. This representative sample was randomly selected from

Saudi population, and then they were asked to fill up a questionnaire. Questionnaires with incomplete data were excluded.

Study tools:

A self-administrated questionnaire was used for evaluating the knowledge, attitude, and practices of the study participants regarding stroke. It was collected from different studies revised by experts and translated into Arabic.

The questionnaire involved 4 parts; the first part deals with subjects' demographics; the second part included questions concerning participants' knowledge about stroke risk factors, causes, as well as warning signs; the third part addressed the attitude and practices of the included subjects towards an event of stroke; and lastly the fourth part asked about the source of their information.

Statistical analysis:

The data from the included questionnaires were analyzed using Statistical Package for Social Science (SPSS) program (V. 22). Categorical variables represented as numbers and percentages. Chi-Square test was used to investigate the association between different variables. P values < 0.05 were considered statistically significant.

RESULTS:

A total of 350 respondents were enrolled into this study. Two hundred and thirty six (67.4%) of them were females. Their ages ranged from 13–74 years with a median age (IQR) of 29 (21–40). Most of the study participants belonged to the age groups 20-30 and 31-40 years (38.9% and 25.1% respectively). The majority (74.6%) of them attained the college degree education (Table 1).

More than half (52.3%) of the studied subjects correctly identified stroke as a disorder of the brain. Whereas, 127 (36.3%) thought that brain, heart, liver, kidney, and lung are sites of stroke. High frequency realized that stroke is a preventable disease and could affect the daily activities of the affected persons (92.6% and 90.6% respectively).

Most participants (74.0%) knew warning signs of stroke, with 229 subjects (65.4%) knowing 2-4 signs. The most frequently recognized warning signs were sudden difficulty in speaking, weakness or paralysis of one side of the body, and tingling and numbness in any part of the body. Two hundred and seventy two

participants (77.7 %) knew risk factors for stroke as illustrated in table 2.

Figure 1 demonstrates that 44.5% of the study participants identified that a combination of hypertension, atherosclerosis, obesity, and smoking are stroke risk factors, whereas 22.2% related stroke to stress and hypertension.

Regarding the cause, high percent of participants (84.3%) reported that stroke is a multifactorial disorder caused by a combination of stress, hypertension, atherosclerosis, high cholesterol, and smoking (Figure 2).

Analysis of factors associated with knowledge of one or more warning signs revealed a significant relationship with the knowledge of stroke risk factors ($p < .05$) as illustrated in table 3.

The response of the study population to an event of stroke was highly variable. Approximately one-third (36.0%) decided to go to hospital at once, and 35.4% chose to call general practitioner or family doctor at first and then go to hospital. On the other hand, few of them thought to only ask family members or relatives for help, take self-medication before going to hospital or to visit primary health care center (.9%, 1.1%, and 4.6% respectively) as shown in table 4.

Considering a decision to go hospital either at once or after calling general practitioner or family doctor is a good practice in this emergency situation, nearly half (55.1%) of them showed this positive attitude. Moreover, age, gender, education, and knowledge of stroke effects on daily activities did not show significant relationship with that positive attitude (Table 5).

The source of the given information was mainly social media, relatives and friends, TV, and radio (22.5%, 21.6%, and 17.9% respectively). Only 14.7% of the studied subjects received their information from health care providers (Figure 3).

DISCUSSION:

The present study demonstrates an inadequate level of the community deep knowledge about stroke. Only half of the studied subjects correctly identified stroke as a disorder of the brain. A combination of hypertension, atherosclerosis, obesity, and smoking were recognized by less than half of the respondents as stroke risk factors. Moreover, not all warning signs of stroke were identified by them. Regarding the respondent's practices to an incident of stroke, only

half of them realized that it's an emergency and decided to go to hospital. Previous regional studies conducted in Riyadh and Jeddah, Saudi Arabia revealed a comparable lack of knowledge about stroke definition, management, risk factors, and warning symptoms [12, 13]. Additionally, a recent comprehensive survey included 2021 adult Saudi subjects from different parts of the Kingdom of Saudi Arabia also explored a deficient level of knowledge, attitude, and practices (KAP) toward stroke risk factors and warning symptoms among the majority of participants [14]. Globally, community surveys from India, Spain, and Ireland showed a similar suboptimal level of knowledge of stroke risk factors and early signs [15,16, 17].

Given the importance of early recognition and hospital presentation of stroke patients for effective management, this research focused on factors related to knowledge of one or more warning signs of stroke. It was found that only a previous knowledge of stroke risk factors has a significant relationship. Neither age nor gender or level of education showed a significant association. Thus adequate information of the public about stroke risk factors is highly warranted. In contrast to our finding, Basfar et al. [12] reported a significant association of female gender and younger age (<30 years) with higher stroke knowledge, which was attributed to more representation of them in the studied sample and their more interest and better education. As well, good Saudi KAP was associated with high educational degree and young age as established by Abdullah Aldebari et al. [14]. Earlier Australian studies on the general population awareness of stroke warning symptoms and risk factors revealed also a relation to the degree of education [18, 19].

In the current study, approximately one-third of the respondents decided to go to hospital at once, and another one-third of them chose to call general practitioner or family doctor at first and then go to hospital. Previous studies conducted in France and USA showed that the majority of their population will call the emergency for any patient with signs of stroke [20, 21].

Deep awareness of the public about stroke risk factors, causes, and early symptoms remains the most critical approach to considerably reduces the significant burden of stroke on the health care system and the society [19]. Robert et al. [22] reported that lifelong controlling of risk factors is best achieved during pre-adolescence or adolescence. This emphasizes the need of finding ways to educate these target age groups about the preventable risk factors,

such as hypertension, diabetes, high cholesterol, obesity, and smoking. Also, early recognition of stroke is key in the timely provision of the needed treatment, which in turn could considerably reduce associated morbidity. This means the warning signs of stroke should be focused while conducting awareness campaigns.

Social media, relatives and friends, TV, and radio were the most important source of information of the studied subjects. Only, few subjects received their information from health care providers. This can be used more effectively for community education and promoting stroke awareness.

It could be conclude that the level of knowledge, attitude, and perceptions of stroke risk factors and warning signs was deficient in our region. Furthermore, it was not correlated with the demographic or educational levels. Future comprehensive health education campaigns should provide accurate and appropriate information regarding stroke risk factors and warning signs, and should highlight the importance of early hospital presentation. Furthermore, it seems advisable to evaluate the role of community societies, schools, and universities in enhancing stroke awareness. Also, the use of printed information, audiovisual programs, and stroke service programs are advocated to improve stroke treatment and prevention.

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Table (1): Sociodemographic characteristics of the study participants.

		N=350	%
Age (years)	Range		13-74
	Median (IQR)		29(21-40)
Age groups	<20	56	16.0
	20-30	136	38.9
	31-40	88	25.1
	>40	70	20.0
Gender	Female	236	67.4
	Male	114	32.6
Education	Primary	1	0.3
	Secondary	55	15.7
	Higher education	11	3.1
	College degree	261	74.6
	Others	22	6.3

Table (2): Knowledge of the included subjects about stroke, its risk factors and warning signs.

		N	%
What organ of the body is affected by stroke?	Brain	183	52.3
	Heart	32	9.1
	Lungs	4	1.1
	Kidneys	3	0.9
	Liver	1	0.3
	Combined	127	36.3
Is stroke preventable?	Yes	324	92.6
	No	26	7.4
Does stroke have an effect on daily activities?	Yes	317	90.6
	No	33	9.4
Do you know any risk factors for stroke?	Yes	272	77.7
	No	78	22.3
Do you know any warning signs of stroke?	Yes	259	74.0
	No	91	26.0
Number of warning signs	1	23	6.6
	2-4	229	65.4
	>4	7	2.0

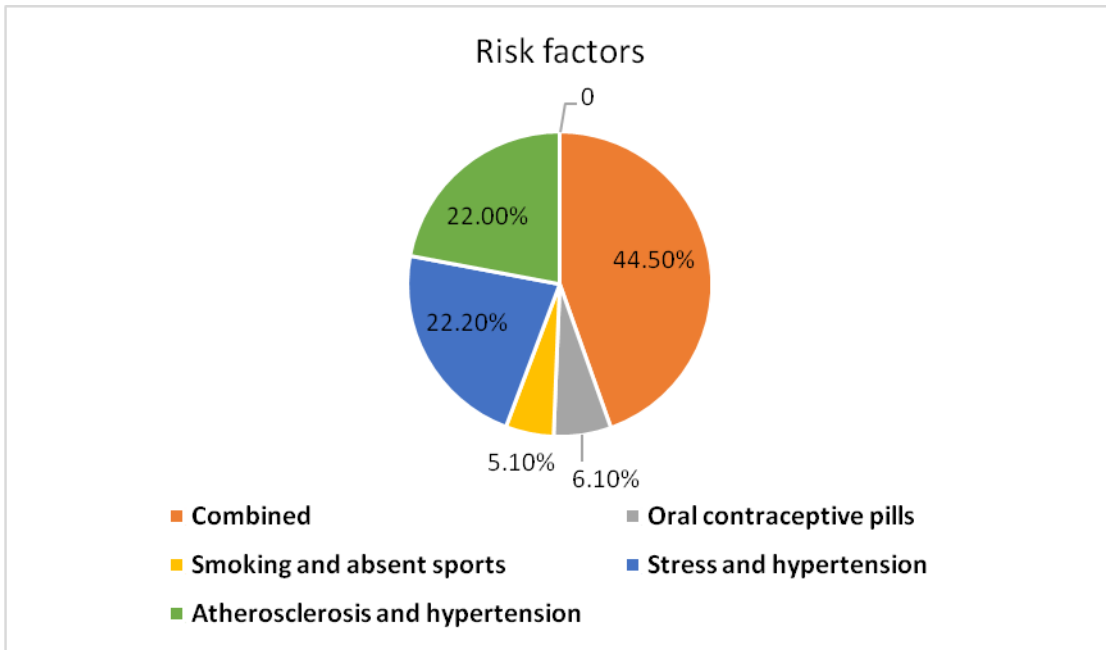


Figure (1): Risk factors of stroke as identified by the study participants.

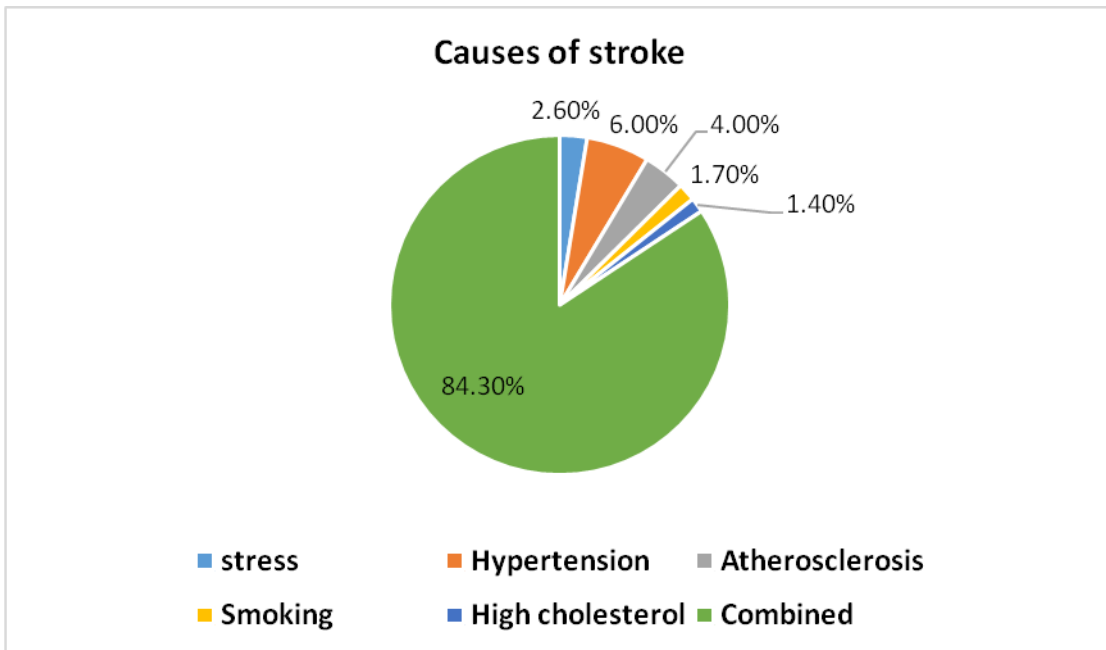


Figure (2): Distribution of causes of stroke as identified by the study participants.

Table (3): Association of knowledge of stroke warning signs and demographics & other information about stroke.

		Know Warning signs				p
		Yes		No		
		N	%	N	%	
Age	<20	41	15.8	15	16.5	.136
	20-30	94	36.3	42	46.2	
	31-40	65	25.1	23	25.3	
	>40	59	22.8	11	12.1	
Gender	Female	179	69.1	57	62.6	.257
	Male	80	30.9	34	37.4	
College degree	No	64	24.7	25	27.5	.603
	Yes	195	75.3	66	72.5	
Know organ affected	Yes	139	53.7	44	48.4	.382
	No	120	46.3	47	51.6	
Known risk factors	Yes	225	86.9	47	51.6	<.001*
	No	34	13.1	44	48.4	
Know that stroke is preventable	Yes	242	93.4	82	90.1	.298
	No	17	6.6	9	9.9	
Know stroke effects on daily activities	Yes	237	91.5	80	87.9	.313
	No	22	8.5	11	12.1	

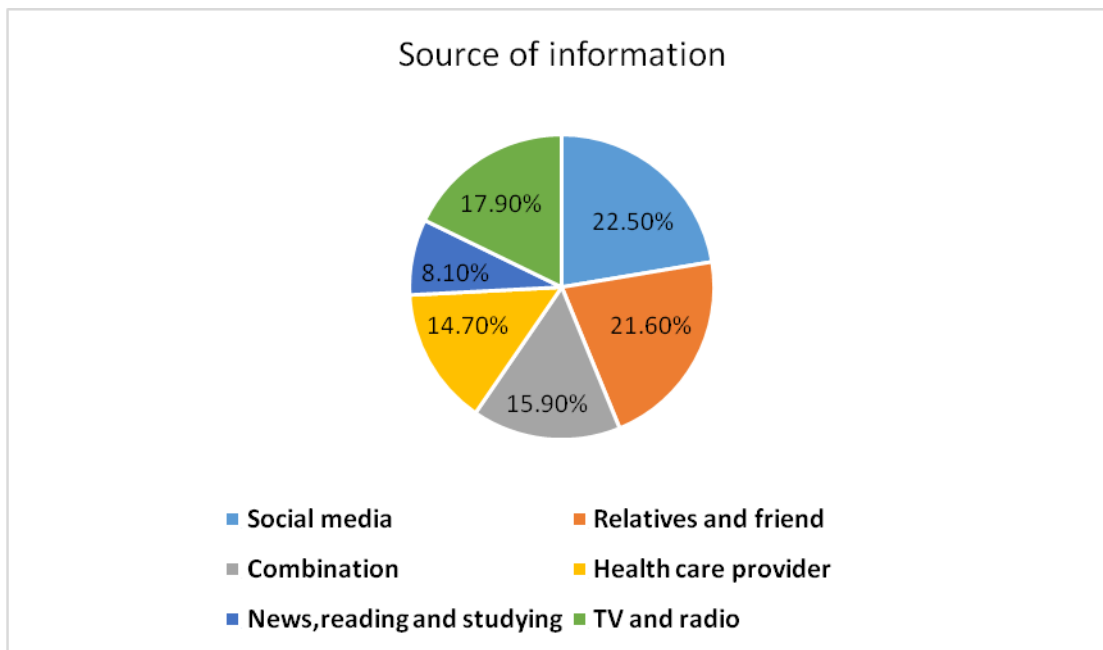
*significant at p <0.05.

Table (4): Attitude and practices of the study participants towards an event of stroke.

	N	%
Go to hospital	126	36.0
Call general practitioner or family doctor and go to hospital	124	35.4
Call general practitioner or family doctor and go to Visit primary health care center	24	6.9
Call general practitioner or family doctor	17	4.9
Visit primary health care center	16	4.6
Combination of hospital and tradition	15	4.3
Invite a Physiotherapist	12	3.4
Go to Sheikh	9	2.6
Self-medication and go to hospital	4	1.1
Ask family members or relatives to help	3	0.9

Table (5): Association of the participants attitude and demographics and some stroke knowledge variables.

		Attitude and practices				P value
		Positive		Negative		
		N	%	N	%	
Age	<20	25	13.0	31	19.7	.101
	20-30	84	43.5	52	33.1	
	31-40	50	25.9	38	24.2	
	>40	34	17.6	36	22.9	
Gender	Female	123	63.7	113	72.0	.102
	Male	70	36.3	44	28.0	
College degree	No	52	26.9	37	23.6	.471
	Yes	141	73.1	120	76.4	
Know that stroke is preventable	Yes	179	92.7	145	92.4	.890
	No	14	7.3	12	7.6	
Know stroke effects on daily activities	Yes	178	92.2	139	88.5	.240
	No	15	7.8	18	11.5	

**Figure (3): Source of information as specified by the study participants.**