

## Knowledge and Attitude of Stroke Among Saudi Population in Riyadh, Kingdom of Saudi Arabia

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### ABSTRACT

**Background:** A stroke occurs when the blood supply to the brain is either interrupted or reduced. When this occurs, the brain does not get enough oxygen or nutrients which cause brain cells to die<sup>2</sup>.

In 2009, stroke was proclaimed as the underlying cause of death in 128,842 persons in the US, resulting in the rate of 38.9 deaths per 100,000 population. There are two broad types of stroke: ischemic and hemorrhagic<sup>4</sup>. The risk factors for stroke are categorized into two principal subdivisions of risk factors: First; The Modifiable Risk factors, which are known to be adjustable with effort and proper knowledge, e.g., smoking and obesity. The other subtype is The Non-modifiable Risk Factors, such as age and positive family history. **Aims:** To measure the knowledge and attitude of stroke among Riyadh city population, along with determining their source of information and the reliability of these sources. **Methods:** The study is a cross-sectional study carried on by a questionnaire to all Saudi population living in Riyadh city, who successfully fulfill the inclusion and exclusion criteria a total number of 304 participants contributed to this study. **Results:** Knowledge about stroke: Respondents were asked whether they comprehend stroke as medical disease/emergency or not. Of the respondents, 198 (65.1%) answered by yes and 106 (34.9) answered by no. Nature of stroke and its leading cause: Respondents were asked whether they think stroke is infectious disease or not. Of the respondents, 2 (0.7%) answered yes, and 277 (91.1%) answered no, while 25 answered by "don't know." Awareness of stroke: Respondents were asked whether they studied about stroke or not or if they've encountered this medical condition by anyway. Of the respondents, 104 (34.2%) answered by yes and 200 (65.8%) answered by no.

**Discussion:** This community-based study shows the level of public knowledge and perception about stroke. Of 304 respondents, 227 (74.7%) knew clearly the most common stroke cause, and they have chosen "hypertension" as the primary risk factor for of stroke. Awareness of stroke especially causes, and symptoms remain the most critical approach to substantially reducing the morbidity and mortality of stroke. In a review prepared by Gorelick<sup>21</sup>, he discovered that lifelong controlling risk factors best achieved during pre-adolescence or adolescence, and that managing requires deep awareness and continuous vital role for the society. Unfortunately, the respondents of this study responded with minimum education levels have no adequate knowledge about the symptoms of stroke nor the leading cause of stroke. **Conclusion:** The study suggests that cultural and educational strategies are essential to

*improve knowledge about stroke in Riyadh community<sup>1</sup>. Considerable efforts should be planned to increase awareness about stroke especially with low income and low-educated population.*

**Keywords:** *Awareness, Attitude, Education, Hemorrhagic, Ischemic, Stroke, Kingdom of Saudi Arabia, Riyadh.*

## INTRODUCTION

A stroke occurs when the blood supply to the brain is either interrupted or reduced. When this occurs, the brain does not get enough oxygen or nutrients which cause brain cells to die<sup>1</sup>. In the US, approximately 40% of stroke deaths are males, with 60% of females. According to the American Heart Association (AHA), compared to white people, people of color have almost twice the risk of a first-ever stroke and a much higher death rate from it.<sup>2</sup>

In 2009, stroke was proclaimed as the underlying cause of death in 128,842 persons in the US, resulting in the rate of 38.9 deaths per 100,000 population. The rate was almost twice as high among people of color (non-hispanic blacks) (73.6 per 100,000).<sup>3</sup> Congruency to the Centers for Disease Control and Prevention (CDC) and Other studies have mentioned that after a transient ischemic attack (TIA), which is considered a minor type of stroke in which the blood flow is only briefly interrupted, tho should be regarded as a medical emergency just like other forms of stroke. Over a third of the people who experience a TIA insult go on to have a major stroke if they have not received any treatment. Between 10-15% will have a major stroke within 3 months of a TIA and 7% to 12% in the the first 12 months.<sup>4</sup>

There are two broad types of stroke: ischemic and hemorrhagic.<sup>4</sup> Both are diametrically opposite conditions: hemorrhage is defined by big amounts of blood within the closed cranial cavity, while ischemia is characterized by low amounts of blood flow that are required to supply a part of the brain with the adequate and sufficient amount of oxygen and nutrients.<sup>5</sup> Each of these types can be divided into subtypes that have somewhat different etiologies, clinical pictures, clinical courses, outcomes, and treatment methods<sup>6</sup>.

The risk factors for stroke are categorized into two principal subdivisions of risk factors: First; The Modifiable Risk factors, which are known to be adjustable with effort and proper knowledge, e.g., smoking and obesity, etc. The other subtype is The Non-modifiable Risk Factors, such as age and positive family history, etc.

Among modifiable risk factors are hypertension, atrial fibrillation, diabetes mellitus; carotid stenosis, and smoking. Age is the most important risk factor among all. Stroke incidence increases with age and, after 55 years old; it doubles every ten years. A high percentage of all strokes occur in people over 65 years. While the impact of stroke remains stable over time, mortality and disability show a decreasing trend, more knowledge, and awareness about stroke will undoubtedly lead to lower mortality and morbidity ratios.<sup>7</sup> Promotion of correct daily lifestyle and cessation of smoking and alcohol intake is recommended. Also, the reduction of dietary salt and increasing physical activity are highly recommended to reduce incidence, especially in males<sup>6</sup>.

This study aimed to measure the knowledge and attitude of stroke among Riyadh city population, along with determining their source of information and the reliability of these sources.

## **METHODOLOGY**

This study is a cross-sectional study carried on by a questionnaire to all Saudi population living in Riyadh city, who successfully fulfill the inclusion and exclusion criteria. We initiated the study by performing a pilot study conducted as the intended study but to a smaller scale of subjects using the questionnaire we've written, to evaluate the feasibility, clearness, and effectiveness of the questionnaire. Next, we distributed the questionnaire in all electronic databases (for example: Monkey survey, Google Docs, Dropbox, Company databases, University databases, etc.) to all Saudi citizens living in Riyadh, Kingdom of Saudi Arabia (KSA).

## **STUDY AREA**

The study was conducted in the city of Riyadh, Which is the capital and largest city of the Kingdom of Saudi Arabia . It is also the capital of Riyadh Province and belongs to the historical regions of Najd and Al-Yamama. It is situated in the center of the Arabian Peninsula on a large plateau and is home to 5.7 million people, and the urban center of a region with a population close to 7.3 million Individuals.A Wide majority of different public places within Riyadh city such Universities, tertiary hospitals, and various work firms will be used to obtain the sample size of this study.

## **STUDY SUBJECTS**

A sample of (n=304) Subjects males and females in Riyadh, Kingdom of Saudi Arabia were the total number of participant included in this study. Randomly selected and interviewed through cyber websites between 1st of July and 31st of August 2016 (total of 2 months). Participants who were between the ages of 18 and 65 year, employed or unemployed, educated or illiterate were included in the study. The participants that live outside of Riyadh city or in other cities of KSA were excluded, along with those who were known to be non-Saudi.

## **STUDY SAMPLING AND TECHNIQUE**

A literature review of previous studies concerning the knowledge of stroke symptoms, causes prevalence, mortality, and the role of media channels and newspapers for increasing awareness about stroke. The final survey accustomed contained 17 items divided into three main sections (all are multiple choice questions): Participants demographic details (nationality, age, marital status, education, offspring, career, income). Knowledge and awareness of stroke (Symptoms, prevalence, mortality and whether he/she have relatives previously suffered a history of stroke). Like other studies suggested the role of media and newspapers are increasing awareness of the population in regards of stroke to which we took into consideration, and asked the participants of their source of information and knowledge.

## **DATA COLLECTION AND STATISTICAL ANALYSIS**

The data collection process was proceeded by all co-investigators themselves using the designed questionnaire.An Arabic version of the questionnaire was also provided for non-english speakers. Distribution of the questionnaire to the subjects was through diverse forms of electronic databases such as (Monkey surveys & Google docs, etc.). Using the statistical program SPSS version, accurate descriptive, and comparative statistical analyses were measured. Chi-squared tests were used to determine the relationships between components of the survey and knowledge of stroke among Saudi population in Riyadh, using logistic regression analyses. P-values from Wald statistics were used to evaluate the significance of predictor variables. Two-tailed probability value of less than 0.05 was considered statistically significant.

## ETHICAL CONSIDERATIONS

Subjects of the study were informed verbally of the purposes of this study and its aims along with the advantages this questionnaire withholds to the community due to their generous participation. The questionnaire was administered either electronically, and was considered as the participant's consent. Collected data was kept secure, confidential and used only for research purposes under the supervision of the principal investigator.

## RESULTS

A total of 304 participants completed the questionnaire. Demographic characteristics of the respondents presented in Table 1. Knowledge about stroke: Respondents were asked whether they comprehend stroke as medical disease/emergency or not. Of the respondents, 198 (65.1%) answered by yes and 106 (34.9) answered by no. Previous history of stroke among family members: Respondents were asked whether anyone of their family members (1st degree or 2nd degree relatives) has suffered any type of stroke or not. Of the Respondents, 66 (21.7%) answered by yes and 203 (66.8%) answered by no while 35 (11.5%) answered by "Don't know ". Nature of stroke and its leading cause: Respondents were asked whether they think stroke is an infectious disease or not. Of the respondents, 2 (0.7%) answered yes, and 277 (91.1%) answered no, while 25 answered by "don't know", and respondents were asked about the primary cause of stroke. Of the respondents, 227 (74,7%) have chosen "hypertension", 7 (2.3%) have chosen "Diabetes mellitus", 10 have chosen "smoking" while 60 (8.2%) have chosen "Don't know" as shown in Table 2.

**Table 1.** Demographic characteristics of the participants(n =304)

Item		Value	Percentage %
Nationality	<i>Saudi</i>	285	93.8%
	Other	19	6.2%
Age	18-30	213	70.1%
	30-45	71	23.4%
	<i>Above 45</i>	20	6.6%
Marital status	Married	107	35.2%
	Single	184	60.5%
	Divorced	8	2.6%
	Other	5	1.6%
Number of offsprings (sons & daughters)	0	210	69.1%
	1-4	68	22.4%
	5-8	25	8.2%
	More than 8	1	0.3%
Work	In governmental companies	68	28.3%
	In special companies	47	15.5%
	Student	112	36.8%
	House wife	30	9.9%
	Don't work	29	9.5%
Education	Primary to secondary school	53	17.4%
	University	233	76.6%
	Post graduate	17	5.6%
	Not educated	1	0.3%
Income	Less than 5000 S.R.	39	12.8%
	Between 5000 and 10000 S.R.	105	34.5%
	More than 10000 S.R.	160	52.6%

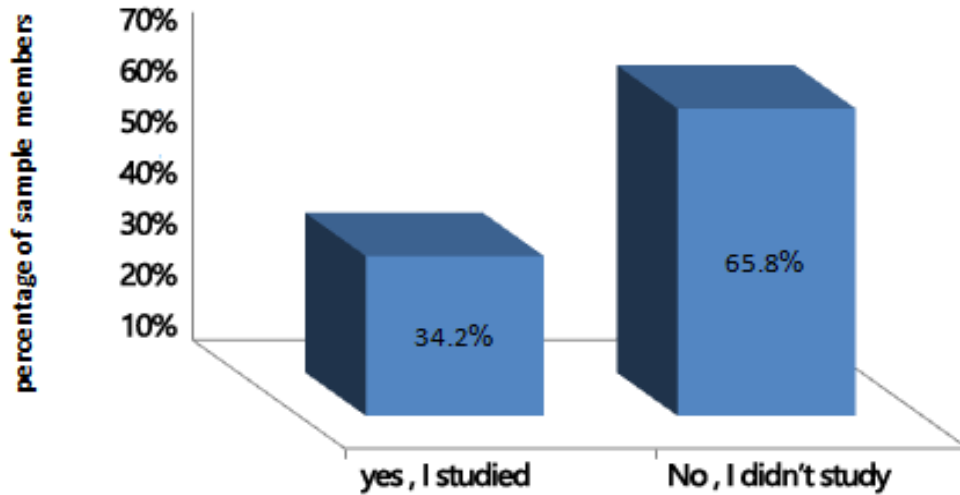
**Table 2.** Respondent's knowledge of stroke (n = 304)

Item	Response	N (%)
Do you know about stroke?	Yes	65.1%
	No	34.9%
Did anyone from your family has suffered from stroke before?	Yes	21.7%
	No	66.8%
	Don't know	11.5%
Do you think stroke is infectious disease?	Yes	0.7%
	No	91.1%
	Don't know	8.2%
What is the main cause of stroke ?	hypertension	74.7%
	Diabetes mellitus	2.3%
	smoking	3.3%
	Don't know	19.7%
What are the symptoms of stroke ?	Asthma and cough	9.9%
	Speaking and walking disability	64.5%
	Fever	2.6%
	Don't know	23%
Did you study before about stroke?	Yes	34.2%
	No	65.8%
Do you think awareness published through media channels and newspapers is enough?	Yes	7.9%
	No	92.1%
Do you think the society has enough awareness about stroke?	Yes	3.3%
	No	81.6%
	Don't know	15.1%
What is the most effective method to improve awareness about stroke among the population?	TV channels	36.2%
	Schools and universities	40.13%
	Magazines and newspapers	3.3%
	Don't know	20.4%

Symptoms of the stroke: The enrolled subjects, were asked about the most common stroke symptom. Of the respondents, 30 (9.9%) have chosen "Asthma and cough", 197 (64.5%) have decided speaking and walking disabilities, 8 (2.6%) have chosen fever while 70 (23%) have selected "Don't know". Awareness of stroke:

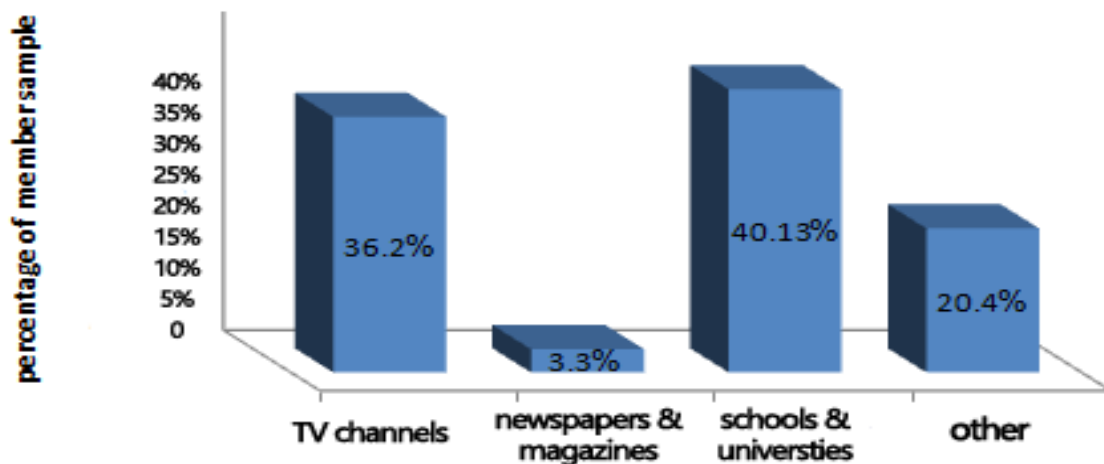
Respondents were asked whether they studied about stroke or not or if they've encountered this medical condition by anyway. Of the respondents, 104 (34.2%) answered by yes and 200 (65.8%) answered by no as shown in Fig 1.

Figure 1. Participants response about whether they studied about stroke or not



Furthermore, the respondents were asked if they think that awareness published through media channels (Tv and Radio) and newspapers is enough or not, of the respondents, 24 (7.9%) answered by yes and 280 (92.1%) answered by no. They've also been asked whether they think their society has enough awareness about stroke or not, 10 (3.3%) answered by yes, 258 (81.6%) answered by no, while 46 (15.1%) answered by "Don't know". Methods for enhancing awareness: Finally, the respondents were asked about the most efficient way to improve awareness about stroke among the Saudi population. Of the respondents, 110 (36.2%) have chosen channels (TV & Radio), 122 (40.13%) have chosen educational institutes (Schools and Universities), 10 (3.3%) have chosen magazines and newspapers while 62 (20.4%) have chosen other methods as shown in Fig 2.

Figure 2. Best method in increasing awareness among Riyadh city population



## DISCUSSION

This community-based study shows the level of public knowledge and perception about stroke. Of 304 respondents, 227 (74.7%) knew clearly the most common cause of stroke, they have chosen "hypertension" as the primary risk factor for stroke. A study that was done in Fayoum and Nigeria which demonstrated that hypertension was the most common reported stroke risk factor.<sup>8</sup> Also reported hypertension to be the most common risk factor among their studied population along with diabetes mellitus and dyslipidemia, which were not chosen as the primary or secondary risk factor for stroke in our study.<sup>9,10</sup> "Difficulty in speaking and walking" was listed as the most common stroke symptom and was the answer of more than 64.5% of the respondents.

In a hospital-based prospective study reported that unilateral weakness and deficits was the most common symptom, these results are in agreement with those of previous research.<sup>9,10</sup> 49% of respondents answered with "no" when they were asked if they know the primary cause of stroke. This result suggests that those participants need to be educated by their doctors or through community educational programs. Although high percentage (91.1%) of respondents correctly identified that stroke can't be transferred from patient to another by infection but still 8.2% of respondents don't know whether the stroke is considered an infectious disease or not and the overcome was that 0.7% of respondents thought that stroke a subtype of infectious diseases. Furthermore, it would seem advisable to evaluate the role of community societies, schools, and universities in enhancing stroke awareness and develop test strategies to accurately measure knowledge and attitude of stroke among Saudi population in Riyadh.

A study that was conducted in India shows subordinate awareness about stroke which is compatible with our study.<sup>20</sup> Another study done in Jordan concluded that the study had serious gaps in knowledge and awareness in regards of stroke; an educational program on stroke may help reduce the stroke burden in Jordan which is also considered highly compatible with our study.<sup>20</sup> Awareness of stroke specially causes and symptoms remains the most critical approach to substantially reducing the morbidity and mortality of stroke. In a review prepared by Gorelick,<sup>21</sup> he discovered that lifelong controlling risk factors best achieved during pre-adolescence or adolescence, and that managing requires deep awareness and continuous vital role for the society.<sup>11,12</sup> Emphasizing the need of finding ways to educate and increase awareness among the population in which to reduce risk factors.

Unfortunately, respondents with minimum education levels have no adequate knowledge about the symptoms of stroke nor the leading cause of stroke. Although the overall attitude towards stroke awareness was sanguine in this questionnaire. Saudi investigators should contribute in designing educational methods for bridging the knowledge-behavior gap of Riyadh populations to change their lifestyle towards prevention of stroke and increasing their awareness levels. Limited movements have been done to evaluate stroke awareness among Saudi population through studies or stroke awareness campaigns,<sup>9,10,12</sup> and most of these studies rather focused on patients awareness. Closed results were shown in other developing countries,<sup>9,12,13</sup> where mass media was lagging behind as a method to enhance stroke awareness.

The role of media in increasing public awareness of stroke is crucial<sup>14</sup> and certainly would positively influence knowledge and attitude of stroke among Saudi population in Riyadh.<sup>15</sup> TV channels and newspapers have been shown to be the primary source of stroke awareness in many developed countries<sup>16,17,21</sup> and increase knowledge of stroke in youth.<sup>18</sup> This may reflect the discrepancy in stroke awareness programs to the public through means among developed and developing countries. Knowledge of stroke warning signs seems to be suboptimal even in some developed countries<sup>8</sup> and linked to older age and poor education.<sup>9,16</sup> Knowledge and awareness about stroke among various populations have been shown to significantly decrease pre-hospital delay and morbidity

numbers.<sup>22</sup> Perception of lifetime risk of developing stroke has a great relationship to awareness of self-reported risk factors in some studies.<sup>9</sup> Unfortunately, in this study, there were no significant difference in knowledge or attitude towards stroke among different age groups nor between different genders (males and females). The results of our study point towards a large gap between the required role of educational institutions and the current population's knowledge and awareness status.

## **CONCLUSION & RECOMMENDATIONS**

The knowledge of stroke symptoms, in general, were the highest, in comparison to the knowledge of stroke's primary risk factors. This study suggests that education strategies and different media methods are crucially required to improve knowledge and awareness of a large broad spectrum of the Saudi population. Enhancing public awareness about stroke by using information and tools appropriate such as adequate numbers of awareness campaigns across various ages and educational levels are highly recommended. Significant efforts directed to old people through media channels and newspapers to increase their knowledge and behavior towards stroke as medical emergency specifically. Lastly, Ministry of health should encourage medical member's to teach patients more about stroke as medical condition/emergent case through every possible opportunity. Also, children should be taught and educated more about stroke through their regular daily studies.

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