Original Research Article

Assessing the Knowledge of High School Students about Stroke as a Leading Cause of Death in Saudi Arabia

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Abstract: *Background:* With a mortality rate of nearly 5.5 million annually, stroke is classified as the second leading cause of death worldwide. A high mortality rate is not only the burden of stroke but also leads to permanent disability to 50% of the survivors, so stroke is a spacious disease on public health with severe social and economic outcomes. A survey conducted about the 10 causes of death in Saudi Arabia in 2017, the mortality rate due to stroke was 6.4%. *Aim:* To assess the knowledge level of high school students about stroke. *Methods:* A cross sectional research design was utilized to collect the data from students of one of high schools in Al Ahsa, Eastern Region, Saudi Arabia. A convenient sampling method was used to select the study sample. The researchers distributed 120 questionnaires and collected 101 complete questionnaires, which gave a response rate of (84.2%). A self-structured questionnaire survey was conducted between high school students regarding stroke knowledge. *Results:* The total score of knowledge about stroke ranged from 3-11 out of 17 (Mean 7.04 $\pm$ 2.5). However, most of the subjects have a low-degree knowledge score (91.1%). *Conclusion:* There was inadequate awareness of stroke among students, in spite of the fact that it corresponds to a major number of deaths worldwide.

Keywords: Knowledge, High School Students, Stroke.

INTRODUCTION

With a mortality rate of nearly 5.5 million annually, stroke is classified as the second leading cause of death worldwide. A high mortality rate is not only the burden of stroke but also leads to permanent disability to 50% of the survivors, so stroke is a spacious disease on public health with severe social and economic outcomes [1]. A survey conducted about the 10 causes of death in Saudi Arabia in 2017, the mortality rate due to stroke was 6.4% [2].

A brain attack is the definition of stroke, it occurs when blood supplying a segment of the brain is interrupted by ischemia or hemorrhage. Essential nutrients and oxygen are carried by blood to the brain, brain cells can be damaged without blood, subsequently will not be able to function properly. The stroke will affect the way the body performs because the brain controls the whole body function. Stroke happens suddenly and has instant impacts on the body functioning [3].

There are some conditions that known as stroke risk factors. Some of these risk factors are non-modifiable. Age is the most important risk factor, with a doubling of risk every decade after the age of 45. Men are more likely to have strokes than women. Economic status can also influence stroke risk, with those living in deprived areas being twice as likely to have a stroke in comparison to those living in more affluent areas. People from Asian ethnic backgrounds have a higher incidence of hypertension and diabetes, doubling their risk of stroke [4]. On the other hand, there are many modifiable risk factors such as cardiovascular diseases, hypertension, and diabetes mellitus and unhealthy lifestyle such as high fat diet, smoking, alcohol consumption, and sedentary lifestyle that increase the risk of stroke [1].

As the brain suffers from blood cut off, it causes some clinical manifestations that act like warning signs for stroke such as trouble vision in one or both eyes, numbness or weakness on one side of the body, confusion, unsteadiness or inability to coordinate, severe headache, and trouble speaking or understanding [5].

Stroke severity and impact depend on which part of the brain that has been deprived of blood. Complications experienced after a stroke attack are associated with the raised incidence of mortality and length of hospitalization in stroke patient's unit. High body temperature, pain, infections, and stroke progress are the most prevalent complications. Other complications that may also happen are myocardial infarction, pulmonary embolisms, and cardiac arrest. Most of the complications occur within the first week of a brain attack. As complications increase, the number of people with disability and mortality increases [6].

The severity and impact of stroke can be prevented if the patient receives care earlier in the hospital. If there is a suspicion that the patient has had a stroke, using the FAST (Face-Arm-Speech-Time) guide will be helpful. The letter F stands for facial weakness if the patient is unable to smile evenly and the mouth or eye may be droopy. The letter A for arm weakness as the patient is only able to raise one of his arms. The letter S stands for speech problems as the patient is unable to speak clearly or may not understand the spoken word. The letter T stands for time to call for emergency help [7].

The patient should be kept comfortable and supported. The patient can lie down with help if he/she is conscious. In addition, the patient should not be given anything to eat or drink because it may be difficult for him/her to swallow. Immediate administration of the fibrinolytic agent (during 3 hours) from the onset of symptoms is useful for an ischemic stroke attack. These can save the ischemic zones in the brain, therefore lowering morbidity and mortality resulting from stroke [8].

By improving public health knowledge about stroke, the prevention might be done successfully. Unhealthy lifestyle behaviours and decreased awareness about stroke could lead to greater risk factors. Awareness of stroke severity and impact needs to be enhanced by increasing stroke knowledge in the community. A variety of ways could be implemented in order to reduce the occurrence of stroke, including educational campaigns and social media [8].

AIM

The main aim of this study was to assess the knowledge level of high school students about stroke.

SUBJECTS AND METHOD

Research Design: A cross sectional research design was utilized.

Setting: The study was conducted at Norah Al Jabr high schools, Al Ahsa, Saudi Arabia.

Population: Norah Al Jabr high school students (N= 400 students).

Subjects: The study sample covered (N = 101 students).

Sampling: A convenient sampling method was used to select the study sample. The researchers distributed 120 questionnaires and collected 101 complete questionnaires, which gave a response rate of (84.2%).

Tool for Data collection

A self-structured questionnaire survey was conducted in high school students regarding stroke knowledge. The research team members were trained to conduct the stroke survey by reviewing the related articles. The questionnaire included items to assess demographic information, general stroke knowledge, risk factors, symptoms, preventive measures and treatment. The questionnaire arranged after reading a lot of articles in the same topic. Pilot study made to assess the validity and reliability of the questionnaire.

Study permission

The study was approved by the Research and Ethical Committee of College of Applied Medical Sciences, King Faisal University. No subject consent was required because no identifiable data were collected.

RESULTS

A total of 120 subjects got the questionnaire in Nora Al Jabr High School, only 101 students answered, which gave a response rate of (84.2%).

Table-1: The demographic data of the subjects

Demographic data		N=101
Age	Range	(14-18)
	Mean ± SD	16.26±1.03
Marital Status	Married	9(8.9%)
	Single	92(91.1%)

Table 1 shows the demographic data. The subjects' age ranges from 14-18 years old (Mean 16.26 ± 1.03). In addition, the subjects' marital status is (8.9%) married and (91.1%) single.

Table-2: General information about stroke

General Information about Stroke		N=101
Stroke is due to lack of blood supply to brain?	True	74(73.3%)
	False	2(2%)
	I don't know	25(24.8%)
The most common type of stroke is ischemic stroke?	True	18(17.8%)
	False	32(31.7%)
	I don't know	51(50.5%)
Stroke is a medical emergency?	True	97(96%)
	False	4(4%)
	I don't know	0(0%)

Table 2 shows the general information that the subjects had about stroke. When questioned, "Is stroke due to lack of blood supply to brain?" (73.3%) of the subjects answered correctly. In addition, the second question which is "The most common type of stroke is ischemic stroke?" was answered correctly by only (17.8%) of the subjects. Furthermore, the third question was about "Is stroke a medical emergency?" (96%) of the sample gave a correct answer.

Table-3: Stroke Risk Factors

Risk Factors about Stroke		N=101
Family history contributes to stroke.	True	36(35.6%)
	False	32(31.7%)
	I don't know	33(32.7%)
Most of stroke incidences occur in people under the age of 65.	True	9(8.9%)
	False	56(55.4%)
	I don't know	36(35.6%)
Stroke is more common among	Men	66(65.3%)
	Women	1(1%)
	I don't know	34(33.7%)
Diabetes increases chance of stroke	True	49(48.5%)
	False	4(4%)
	I don't know	48(47.5%)
High blood pressure increases chance of stroke?	True	60(59.4%)
	False	1(1%)
	I don't know	40(39.6%)
High cholesterol increases chance of stroke?	True	59(58.4%)
	False	0(0%)
	I don't know	42(41.6%)
Epilepsy increases chance of stroke	True	33(32.7%)
	False	30(29.7%)
	I don't know	38(37.6%)

As shown in Table 3, the subject's knowledge about stroke risk factor was tested. We found that few numbers of students could answer 5 risk factors correctly which are family history (35.6%), diabetes (48.5%), high blood pressure (59.4%), high cholesterol (58.4%), and gender "male" (65.3%) of subjects. However, most of the students failed to answer, "Most of stroke incidences occur in people aged less than 65" by 55.4%. Nevertheless, 37.6% did not know if epilepsy increases the chance of stroke, which is false.

Table-4: Signs and symptoms of stroke

Signs and symptoms of stroke		N=101
Symptoms of a stroke usually come on	Gradually	42(41.6%)
	Suddenly	58(57.4%)
	I don't know	1(1%)
Slurred speech is a sign of stroke?	True	60(59.4%)
	False	21(20.8%)
	I don't know	20(19.8%)
Weakness in the arms/legs is a sign of stroke?	True	68(67.3%)
	False	13(12.9%)
	I don't know	20(19.8%)
Stroke normally affects both sides of the body.	True	57(56.4%)
	False	17(16.8%)
	I don't know	27(26.7%)

Table 4 shows the questions about signs and symptoms of stroke. The respondents answered correctly in "Symptoms of stroke usually come on suddenly" by 57.4%, "Slurred speech is a signs of stroke" by 59.4%, and "Weakness in the arms/legs is a sign of stroke" by 67.3%. On the other hand, the respondents failed to answer, "Stroke normally affects both sides of the body" by 56.4%.

Table-5: Treatment

Treatment		N=101
There are current treatments for stroke?	True	41(40.6%)
	False	13(12.9%)
	I don't know	47(46.5%)
Nobody makes a full recovery after a stroke.	True	46(45.5%)
	False	24(23.8%)
	I don't know	31(30.7%)

Table 5 shows two questions about the treatment of stroke. First question was "Are there current treatments for stroke?" the result was that near to half of the respondents did not know if there is a treatment or not by 46.5%. In addition, near to half of the respondents answered the second question incorrectly by 45.5% which is "Nobody makes a full recovery after a stroke".

Table-6: Stroke Prevention

Prevention		N=101
Which of these could help reduce the chance of stroke?	Fresh air	17(16.8%)
	Vitamin C	9(8.9%)
	Exercise and healthy lifestyle	36(35.6%)
	I don't know	39(38.6%)

As shown in table 6, most of the subjects did not know how to prevent/reduce the chance of stroke by (38.6%), which could be prevented by exercise and healthy lifestyle.

Table-7: Total Knowledge Score

Knowledge score		N=101
Total score	Range	(3-11out of 17)
	Mean ± SD	7.04±2.5
Knowledge degree	Low (<60%)	92(91.1%)
	Medium (60% - <85%)	9(8.9%)
	High (85%-100%)	0(0%)

As shown in table 7. The total score of knowledge ranged from 3-11 out of 17 (Mean 7.04 $\pm$ 2.5). However, most of the subjects have a low-degree knowledge score (91.1%) about stroke. While no one had high knowledge score.

DISCUSSION

Our results demonstrated that high school student's knowledge about stroke is low, as (91.1%) of subjects have a low-degree knowledge score. The finding was congruent with Umar *et al.* study, which was done in Michigan, United States which indicated that the knowledge of stroke is relatively poor. In our study, (96%) of our participants identified

stroke as a medical emergency, which is relatively higher than Umar *et al*. [9] study as (64.5%) of respondents reported that they would call emergency number. Furthermore, (73.3%) of our participants recognized that stroke as lack of blood supply to brain. In Abdullah *et al*. study, (50.1%) of participants recognized that stroke occurs in the brain [9].

In our study, the knowledge about stroke risk factors was examined in high school students. The students have identified that risk factors may include family history of stroke (35.6%), diabetes (48.5%), high blood pressure (59.4%), and high cholesterol (58.4%). Adebimpe wrote in his study that only (41.3%) checked their blood pressure. Therefore, it is very important to give awareness to the population about stroke risk factors [10].

In our study, students failed to answer the question about the age that stroke is more common on it (55.4%). However, the result of Falavigna's study showed insufficient knowledge that one of stroke risk factors is being underage of 50 year [11]. A study of Nigerian secondary school students found that students had less knowledge of stroke risk factors and symptoms [12].

In our study, more than half of the participants answered inaccurately the given questions about signs and symptoms of stroke. The question that (56.4%) failed to answer correctly is "stroke normally affects both sides of the body". In our study, the most common identified symptoms of stroke were weakness in arms/legs that (67.3%) answered it correctly, and slurred speech (59.4%) answered it accurately. This is in the same line with a study of Falavigna *et al.* [11] in which the most common reported symptoms of stroke were dizziness (79%), trouble speaking (77.8%), and paralysis of one side of the body (77.6%) [11]. Another study with the same results was the study of Umar which found that overall knowledge of stroke symptoms and risk factors is low in youths and adolescents.

In our study, the participants answered "I don't know" by (46.5%) to treatment of stroke. Moreover, (45.5%) of the participants answered incorrectly to "Nobody makes a full recovery after a stroke." This is in contrast with a study of Thapa *et al*. as it has a positive result of (78.5%) to treatment of stroke [13].

In our study, (38.6%) of the participants did not know the preventive measures of stroke, (25.7%) of the participants answered incorrectly in how to prevent stroke, and only (35.6%) identified "Exercise" as a preventive method. This is not in line with a study of Thapa *et al.* which had a positive result of (82.5%) to the question "Stroke can be prevented." [13].

CONCLUSIONS

There was inadequate awareness of stroke among students; despite of it corresponds to a major number of deaths worldwide.

Conflicts of interest

There are no conflicts of interest.

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