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Knowledge and risk factors for stroke among undergraduates in southwestern Nigeria

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Abstract

The burden of noncommunicable diseases due to stroke is increasing. Despite this, community-based studies that could stimulate stroke primordial prevention among the population at risk are sparse. This study assessed community knowledge and risk factors of stroke among university undergraduates in Osogbo, southwestern Nigeria. A descriptive cross-sectional study was conducted among 420 male undergraduates selected through multi-stage sampling method. Research instruments were self-administered semi structured questionnaires. Data was analyzed using the SPSS software version 17.0. Four hundred and seven (96.9%) have heard about stroke. Good mean knowledge score of causes, symptoms, warning signs and risk factors of stroke were 62.6%, 61.7% and 42.1% and 56.7% respectively. Three hundred and nine (75.9%) said the body part primarily affected by stroke was the brain, while 35 (8.6%) said it was the kidneys. Only 73 (17.9%) perceived that they were at risk of stroke while 33 (8.1%) said they could not have stroke. Single risk was found among 43 (10.2%), double risk among 334 (79.5%) and multiple (>2) risks among 43 (10.2%) of respondents. Predictors of good knowledge of risk factors among respondents found on multivariate analysis were older age, having one or both parents who had stroke in the past, smoking cigarettes, and having multiple risk factors of stroke. It was concluded that respondents had good awareness and relatively good knowledge of causes, symptoms and risk factors of stroke; however, respondents had poor knowledge of warning signs. Sustained public awareness could bridge existing gap among respondents towards primordial stroke prevention.

Keywords

Stroke, Undergraduates, Risk factors, Knowledge, Osogbo

Introduction

The epidemiological transition from communicable to noncommunicable diseases (NCD) has been recognized over several decades. Increased predisposition to western lifestyles and uncontrolled urbanization had been reported as some of the reasons. Diseases such as stroke, diabetes and hypertension are now on the rise.¹ Stroke is a noncommunicable disease of public health importance that causes deaths and disability worldwide, and Nigeria is not an exception to this trend. Though a rural study in southwestern Nigeria puts the crude prevalence of stroke at 0.58 per 1,000 population,² community-based studies on the prevalence, knowledge and attitude of sub-Saharan Africans associated with stroke risk factors are sparse.

Outcomes of primordial preventive efforts against stroke and other NCDs would depend on the extent and pattern of awareness of modifiable risk factors, warning signs, and knowledge and attitude of the vulnerable groups to the disease. Common known risk factors for stroke include hypertension, high cholesterol diet, diabetes, heart disease and smoking. These risk factors for stroke are controllable and preventable. However, public awareness of stroke is generally low.³ The changing epidemiology of hypertension and stroke, most specifically the age of onset, has reduced over the years and is putting youth at greater risk.

In order to facilitate health interventions that would reduce mortality and morbidity due to stroke, it is important to assess public awareness about the disease and its risk factors most especially among the younger population who are still amenable to primordial and primary

prevention. This study assessed community knowledge and risk factors of stroke among university undergraduates in Osogbo, southwestern Nigeria.

Methods

Study Area

Osogbo, the capital city of Osun state in southwestern Nigeria, has a total population of about 450,000 according to a recent projection of the 2006 national population census.⁴ The prevalence of stroke in the general population was not known. The general traditional belief was that stroke occurs as a result of excessive thinking and sins against God. There is a teaching and a general hospital in the city. There are three tertiary institutions which include LAUTECH College of Health Sciences, the Fountain University (which is privately owned) and the Osun State University.

Study population

Study population consisted of male students who are currently enrolled as full time students in selected tertiary institutions.

Study design

This was a descriptive cross-sectional study.

Sample size estimation

Using the Leslie Kish formula (for the calculation of sample size for population less than 10,000 as modified)⁵ and prevalence rate of 0.58,² a sample size of 374 was calculated. This was increased to 400 to take care of attrition and non-response in the study.

Sampling

A multi-stage sampling method was adopted. In Stage I, two out of three institutions were selected at random using simple balloting. Questionnaires were equally allocated to both institutions. In an institution in Stage 2, two academic levels out of four (most students do a four-year course) were randomly selected, employing simple balloting. The same technique was used in selecting a course or class from each selected academic level in Stage 3. In a class (Stage 4), a systematic random sampling of one in three students as they sat in the class preparing for a lecture on the day of data collection was drawn. Questionnaires were administered until the number of questionnaire allocated for that class got exhausted. In case the number was not exhausted in a class, another class or course was randomly selected and the procedure repeated for subject selection.

Research instruments

Research instrument was a semi structured and pre-tested self-administered questionnaire supervised by two trained nurse assistants in each of the institutions. Study variables included socio-demographic characteristics, awareness and knowledge of warning signs, symptoms and risk factors of stroke. The pretesting was carried out by administering the questionnaires on twenty students of the University of Ibadan in neighboring Oyo State. Feedback received from

respondents on the questionnaire was used to make corrections to the questionnaire before the original research data collection.

Ethical clearance

Ethical clearance to conduct the study was obtained from LAUTECH Teaching Hospital ethical review committee. Further permission was obtained from the dean of selected faculty and heads of departments whose students were selected for the study.

Data management

Data was entered into the SPSS software version 17.0 and validated through double entry and manual random checks. Frequency tables and charts were generated. Knowledge aggregate score was calculated based on the allocated number of questions; a correct answer attracted +1 mark while an incorrect answer attracted 0 mark. Scores below the average score were regarded as poor knowledge scores; scores above the average were good knowledge scores. Single and double risk were eventually re-categorized as 'low' while multiple risks (risks ≥ 3) were re-categorized as 'high' risk. The chi squared test was employed in bi-variate analysis. A multivariate analysis using the binary logistic regression model was carried out using some selected variables against the major outcome variables. *P* values were considered significant at values <0.05 for all inferential statistics.

Results

Table 1 shows: mean age of respondents was 21.5 ± 3.4 years, all were males, the 200 and 300 level classes constituted 161(38.3%) and 163 (38.8%) respectively, 284 (67.6%) were Christians, while 387 (91.2%) were single.

Table 1: Socio-demographic data of respondents

Variable	N	%
Age (mean 21.5 ± 3.4 years)		
15-19	113	26.9
20-24	239	56.9
25-29	62	14.8
>30	6	1.4
Level		
100	41	9.8
200	161	38.3
300	163	38.8
400	49	11.7
Others	6	1.4
Religion		
Christianity	284	67.6
Islamic	115	27.4
Traditional	21	5.0
Others		
Marital status		
Single	387	92.1
Currently married	23	5.5
Divorced/separated/widowed	10	2.4

Table 2 shows the awareness and general knowledge about stroke. 407 (96.9%) have heard about stroke; the major source of information was tv/radio for 160 (39.3%) and health care workers for 110 (26.3%). About 287 (67.3%) could readily describe or define stroke; 334 (82.1%) described it as a noncommunicable disease, while 132 (32.4%) believed that stroke was uncommon.

Table 2: Knowledge about warning signs and causes of stroke

Variable	F	%
Have you heard about stroke		
Yes	407	96.9
No	13	3.1
Sources of information (n=407)		
TV/Radio	160	39.3
Newspaper/textbook	11	2.7
Internet	92	22.6
Health care workers	107	26.3
Others	37	9.1
Basic knowledge of stroke (yes option)		
Could describe stroke	287	68.3
Stroke is uncommon	132	32.4
It is not a communicable disease	334	82.1
Have ever seen someone with stroke	297	73.0
Stroke can be diagnosed and treated	306	75.2
Knowledge of symptoms or signs of stroke		
Weakness in the arms or upper limb	164	40.3
Weakness in the legs or lower limbs	55	13.5
Inability to urinate or defecate	26	6.4
Inability to speak	30	7.4
Losing consciousness	6	1.5
Both sides of the body affected	34	8.4
Only one side of the body is affected	56	13.8
Knowledge of leading causes of stroke		
High blood pressure	259	61.7
Diabetes	36	8.6
RTA/trauma	24	5.7
Obesity/high cholesterol	164	40.3
Excessive thinking	57	13.6
Epilepsy	11	2.6
Others e.g. smoking	14	3.3
Body part/organ primarily affected by stroke are		
Kidneys	35	8.6
Brain	309	75.9
Heart	63	15.5
Knowledge of Warning signs		
Numbness in the limbs	117	43.5
Sudden headache	35	8.6
Sudden loss of balance	100	24.6
Sudden difficulty with seeing or speaking or sleeping	71	17.4
Others	24	5.9

Table 3 shows the knowledge of risk factors of stroke. The parents of 104 (25.6%) and 65 (16.0%) of the respondents were reported to have past history of high blood pressure and stroke respectively. Common complications of stroke known to the respondents include mortality 342 (84.0%), heart failure 272 (66.8%) and kidney disease 149 (36.6%).

Table 3: Knowledge of risk factors of stroke

Variable	F	%
Known risk factors (yes option)		
Old age	305	74.9
Being a male	60	14.7
Having hypertension	336	82.6
Being fat or having high cholesterol	174	42.8
Having diabetes	146	35.9
Cigarette smoking	110	27.0
Having a family member having stroke	40	9.8
One or both parents reportedly had the following health problems (yes option)		
High blood pressure	104	25.6
Stroke in the past	65	16.0
Complication of stroke (yes option)		
Can kill	342	84.0
Heart failure	272	66.8
Kidney disease	149	36.6
Do you think that you are at risk of having stroke		
Yes	73	17.9
No	248	60.9
Don't know/no response	86	21.2
Do you think you can have stroke		
Yes	33	8.1
No	345	84.8
Don't know/no response	29	7.1
Alcohol (yes option)		
Have you ever taken alcohol	238	58.5
Still takes alcohol	160	39.3
Smoking (yes option only)		
Have you ever taken cigarette	65	16.0
Still smokes	32	7.9
What is your pattern of table salt intake like		
Excessive or heavy	18	4.4
I spray food with salt	57	14.0
I don't spray cooked food with salt	51	12.5
Very low salt intake	281	69.0
Other basic knowledge about stroke (Yes options only)		
Often take food from eateries like Mr. Biggs	226	55.5
Regularly eat food like egg, margarine, butter, cheese	242	59.5
I do daily exercises	235	57.5
Ever checked your blood pressure	168	41.3
Ever checked your blood sugar level	23	5.7

Figure 1 shows mean knowledge scores of some parameters concerning stroke. Good mean knowledge score of causes, symptoms, warning signs and risk factors of stroke were 62.6%, 61.7%, 42.1% and 56.7% respectively. Three hundred and nine (75.9%) said the body part primarily affected by stroke was the brain, while 35 (8.6%) said it was the kidneys. Only 73 (17.9%) believed that they were at risk of stroke while 33 (8.1%) said they could not have stroke. Considering consumption of table salt as a possible risk factor, only 18 (4.4%) said their salt intake was excessive or heavy while 281 (69.0%) admitted very low salt intake. Only 168 (41.3%) ever checked their blood pressure, 23 (5.7%) ever checked their blood sugar level, while 306 (75.2%) believed that stroke can be diagnosed and treated.

Figure 1: Knowledge score of causes, warning signs, symptoms and risk factors

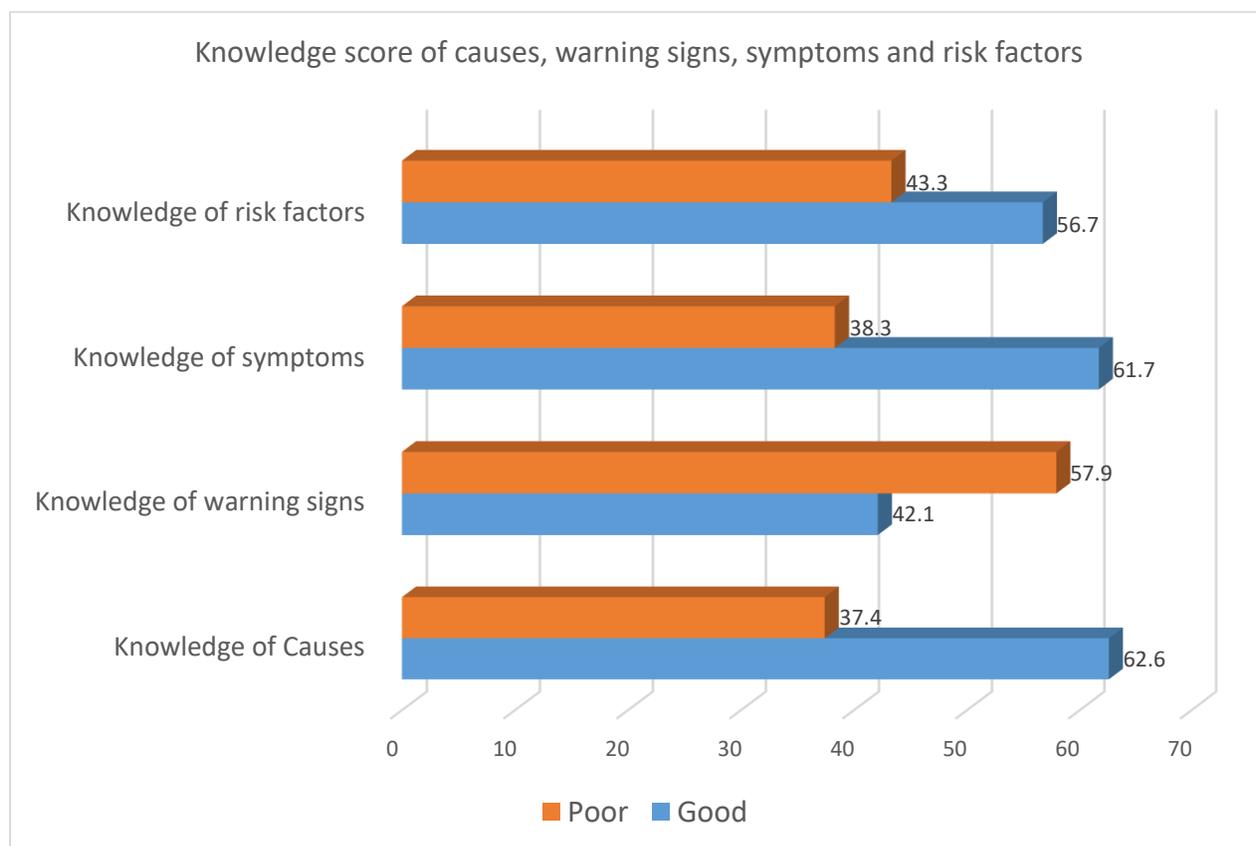
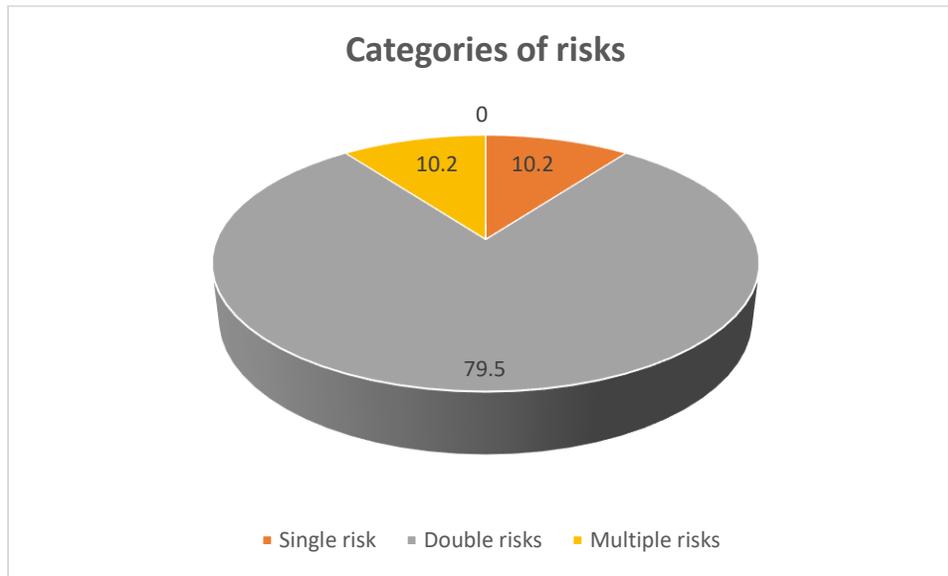


Figure 2 shows the pattern of risk of stroke in relation to the following predisposing factors: smoking, alcohol intake, past family history of hypertension or stroke, consumption of western/high cholesterol diet. Single risk was found among 43 (10.2%), double risk among 334 (79.5%) and multiple (more than double risk) among 43 (10.2%) of respondents.

Figure 2: Categories of risks



In Table 4, a statistically significant association was found between awareness of stroke and risk categories, believing that one is at risk, and all the four knowledge scores (except the mean knowledge of symptom) with $P < 0.05$ on bi-variate analysis. On multivariate analysis using binary logistic regression model, respondents who were older than 19 years (non-adolescents) were 1.7 times more likely to have good knowledge of risk factors compared to adolescents 15-19 years and this observation was statistically significant. (OR 1.74, 95%CI 1.281-2.363, $P = 0.001$). Respondents whose one or both parents had stroke in the past were 1.8 times more likely to have good knowledge score of stroke compared to those whose parents did not, though this observation was not found to be statistically significant (OR 1.8, 95%CI 0.160-2.239 and $P = 0.633$).

Table 4: Association between awareness, knowledge of risk factors of stroke and some selected variables

Bi-variate analysis				
	Aware of stroke		X ²	P
	Yes	No		
Knowledge score of warning signs			9.925	0.002
Good	166(93.8)	11(6.2)		
Poor	241(99.2)	2(0.8)		
Knowledge of causes			5.814	0.016
Good	259(98.5)	4(1.5)		
Poor	148(94.3)	9(5.7)		
Knowledge of risk factors			9.310	0.002
Good	236(99.2)	2(0.8)		
Poor	171(94.0)	11(6.0)		
Knowledge of symptoms			1.366	0.243
Good	253(97.7)	6(2.3)		
Poor	154(95.7)	7(4.3)		
Risk categories			28.170	0.001
Single	36(83.7)	7(16.3)		
Double	328(98.2)	6(1.8)		
Multiple	43(100)	0(0.0)		
Do you think that you are at risk			5.972	0.050
Yes	82(98.8)	1(1.2)		
No	325(96.4)	12(3.6)		

Binary logistics regression (Good knowledge of risk factors of stroke)				
	OR	95%CI		P value
		Lower	Upper	
Age ((Reference category= 15-19 years)	1.74	1.281	2.363	0.001
One or both parents having stroke in the past (Reference category=No	1.80	0.160	2.239	0.633
Smoking (Reference category=No)	1.71	1.011	2.877	0.045
Taking alcohol (Reference category=No)	0.94	0.227	1.063	0.071
Taking daily exercises (Reference category=No)	1.054	0.640	1.735	0.837
Risk categories (Reference category=multiple risk)	0.41	0.256	0.654	0.001

Respondents who were smokers were 1.7 times more likely to have good knowledge of risk factors compared to non-smokers and this observation was found to be statistically significant (OR 1.71, 95%CI 1.011-2.877 and P=0.045). There was no difference in comparison of knowledge of risk factors among those taking alcohol and those not taking alcohol and among those who did daily exercise and those who did not; these two observations were both not

statistically significant (P- 0.071 and 0.837 respectively). However, respondents with single risk were 2.5 times less likely to have good knowledge of risk factors compared to those with multiple risks and this observation was found to be statistically significant (OR 0.41, 95%CI 0.256-0.654). Thus, predictors of good knowledge of risk factors among respondents were: older age, parents who had stroke in the past, cigarette smoking, and having multiple risk factors of stroke.

Discussions

Socio-demographic characteristics

Stroke, also referred to as cardiovascular accident, is a sudden neurologic deficit manifesting either as vascular occlusion from thrombosis or embolism or from hemorrhage into the brain due to a blood vessel rupture usually due to hypertension.⁶ The major source of awareness about stroke in this study was tv/radio; this is in agreement with similar studies reporting the usefulness and relevance of the mass media in improving public awareness about noncommunicable diseases as well as their warning signs.^{7,8} The radio and tv are accessible and affordable to most households in Nigeria, and they have been a veritable means of disseminating information on health matters.

A statistically significant relationship was found between age of our respondents and awareness of stroke. This finding disagreed with a study which indicates no significant relationship between the awareness level of stroke and age and educational level of their respondents.⁹ Compared to the younger ones, older students are more likely to have read books on stroke, more likely to have had lectures on topics related to stroke, and more likely to have also seen a stroke patient (based on personal experience which is expected to rise with age).

Knowledge of risk factors

Regarding knowledge of risk factors, a little above half of our respondents had good mean knowledge score. This is better compared to study by Pandian et al in which about two-thirds of the participants had poor knowledge of risk factors¹⁰. This poor knowledge pattern was also supported by several other studies.¹¹⁻¹³ Awareness and good knowledge of stroke risk factors could encourage better attitude towards weight reduction messages, obesity and hypertension. Poor awareness and knowledge is an indication that better awareness programs are needed, to implement weight reduction strategies targeting this vulnerable population and encourage behavioral modification toward primordial, primary and secondary prevention.

The commonly identified stroke risk factors known to majority of our respondents were hypertension, stress, hypercholesterolemia, smoking and obesity; this is in agreement with other studies.^{10, 14, 15} In a study by Mississippi State Department of Health, only one-fifth of the respondents indicated high cholesterol and cigarette smoking as stroke risk factors.¹⁶ Knowledge of a disease could be a pointer to the preparedness of the patient in seeking help and his or her attitude toward prevention efforts. These patterns of knowledge of causes, risk factors and warning signs call for the improvement of the awareness level for stroke, including risk reduction activities.

Knowledge of warning signs/symptoms

In this study, nearly three-fifth of respondents had poor mean knowledge of warning signs of stroke, with the highest known warning sign being numbness in the limbs (known by a little less than half of respondents). Other warning signs were known among far fewer number of respondents, thus suggesting an overall poor knowledge of warning signs. Sallar et al reported much lower good knowledge scores: 21.6% could name one warning sign and 11.7% could name two warning signs.¹⁷ The poor level of awareness of stroke warning signs relative to risk factors was consistent with two previous reports.^{18,19} However, higher knowledge figures were reported from Johnston et al in which three quarter and three-fifth of respondents, respectively, were able to select correctly the first and second warning signs of stroke.²⁰

About three quarter of our respondents knew someone who had stroke before, in agreement with study by Johnston et al that reported two-thirds.²⁰ Likewise, three quarter of our respondents opined that brain is the body part being affected by stroke; this agrees with study by Nicol et al.⁹

Symptoms of stroke

In our study, a little less than one third identified five of the listed symptoms of stroke, and the weakness of the arms or upper limb was the most known symptom. This is in agreement with a study by Nicol et al in which only one quarter of respondents identified all five symptoms.⁹ In study by Hickey et al,³ less than half of the population identified these established warning signs (with the exception of slurred speech). Low and middle-income countries including Nigeria have been found to account for over 87% disability adjusted life years (DALYs) from stroke;²⁰ this calls for a need to step up awareness improvement efforts among stakeholders involved in prevention of noncommunicable diseases in Nigeria.

This study has opened up opportunities for evidence based primordial and primary prevention of hypertension and stroke since it was carried out among the young population who are not yet affected but vulnerable to developing hypertension and stroke. Future studies may wish to consider and compare findings in both sexes and include a direct measure of blood pressure in order to determine prevalence of hypertension, which is the major risk factor for stroke in this study area. In conclusion, poor knowledge of warning signs and poor risk perception of stroke were found among studied respondents, amidst significant risk factors. The need to increase public awareness of stroke risk factors and warning signs is thus important in addressing the identified gaps in knowledge and promotion of primary and secondary prevention strategies among the young population studied.

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