

# HEALTHCARE WORKERS' KNOWLEDGE AND PRACTICES OF STROKE PREVENTION IN A NIGERIAN HOSPITAL

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## Abstract

Cardiovascular diseases (CVDs) remain the leading cause of death globally, with stroke identified as a significant contributor to the growing burden of mortality and disability. Stroke, a major component of CVDs, has experienced a sharp rise in incidence and fatality in the past two decades, accounting for approximately 10% of all global deaths and causing the loss of over 44 million disability-adjusted life years (DALYs) annually. The situation is particularly alarming in sub-Saharan Africa, where the highest age-standardized incidence rates are recorded. In Nigeria, stroke poses a critical public health challenge, with high case fatality rates ranging from 28% to 37% and long-term functional disability rates nearing 61%. These outcomes not only affect survivors but also place a significant emotional and economic burden on caregivers and the health system. The disease's preventable nature underscores the need for robust awareness, timely diagnosis, and effective prevention strategies among healthcare professionals and the general population. Aligning with the Sustainable Development Goals (SDGs) target of reducing premature mortality from non-communicable diseases by one-third by 2030, there is a pressing need for improved health system financing, capacity-building of the healthcare workforce, and universal access to quality healthcare services. This paper underscores the critical importance of stroke prevention as a public health priority and the role of healthcare workers in implementing effective, evidence-based preventive practices, particularly in resource-constrained settings like Nigeria.

**Keywords:** Stroke Prevention, Cardiovascular Disease, Disability, Public Health, Nigeria

## Introduction

Cardiovascular diseases are a group of disorders believed as the main cause of mortality and the major contributor to disability globally<sup>1</sup>. Heart and blood vessel conditions are the main parts of cardiovascular disease, including stroke, coronary heart disease, and other disorders that adversely influence global and public health<sup>2</sup>. Stroke remains the second leading cause of death worldwide, with a documented 26% increase in stroke mortality in the last two decades, consisting of about 10% of all deaths and killing 5.5 million people each year, with 44 million disability-adjusted lifeyears (DALYs) lost<sup>3,4</sup>. Stroke was the sixth most common cause of death in Africa in 2019, presenting a growing trend, according to WHO approximations<sup>5</sup>. Globally, the maximum agestandardized incidence of stroke is in sub-Saharan Africa<sup>6</sup>. According to the Centers for Disease Control and Prevention (CDC), stroke is the principal source of preventable disability globally<sup>7</sup>. It is the main reason for long-term disability and has likely a huge emotional and socioeconomic drain on patients, their families, and health services. These

disabilities that result from the disease are recognized to have far-reaching implications on the health and quality of life of stroke survivors and their caregivers<sup>8</sup>. In Nigeria, stroke has been stated to be responsible for the bulk of medical admissions, with 30-day case fatality rates of 28 to 37% and functional disability rates of 60.9%<sup>7,8</sup>. The Sustainable Development Goals (SDGs)<sup>9</sup> 3 by 2030 aims to reduce by one-third premature mortality from non-communicable diseases through prevention and treatment and promote mental health and well-being, Strengthen the prevention and treatment of substance abuse, including narcotic drug abuse and harmful use of alcohol. It also substantially increases health financing, the recruitment, expansion, re-training, and retaining of the health workforce in developing countries, least developed countries, and Small Island developing States. Universal health coverage included financial risk protection, access to quality essential healthcare services, and access to safe, effective, quality, affordable essential medicines and vaccines for all<sup>9</sup>.

Preventive approaches in sub-Saharan Africa are extremely necessary to lessen the burden of stroke and reduce disability and healthcare costs. Literature proposes that preventive care services in African countries, and data from developed countries suggest that a strong importance on prevention would be needed to reduce the burden of stroke<sup>10</sup>. From a public health point of view, preventive strategies to reduce the risk of stroke would provide more cross-cutting. It is likely that improvement in general knowledge (K) about stroke will help people recognize the signs or symptoms of stroke correctly and will add to other practical information about stroke and how to manage it. Also advising those at high risk to seek out knowledge (k) on stroke will consequently influence people on good attitudes (A) towards stroke prevention practices (p). Then, accepting a healthy lifestyle will contribute to changing the practice (P) of conventional management of stroke especially in sub-Saharan Africa<sup>11, 12</sup>. Therefore, understanding what a stroke is would help young patients and their parents evaluate the causative factors and how to prevent it. It will also contribute to the execution of suitable health education policies.

In the study conducted among the rural population in Saudi Arabia, subjects with college degrees or above demonstrated a statistically significantly higher average score of attitudes towards stroke prevention than those with high school or below<sup>13</sup>. And those who were employed showed a significantly higher practice towards stroke prevention than the other occupations. They concluded that those results were expected as knowledge about stroke prevention increases with higher education and being employed<sup>8</sup>. Thus, attitudes and practices would be enhanced with good knowledge. A possible explanation for these results might be that employed and educated people are either exposed to more educational programs or can easily access required resources.

There is a paucity of evidence on primary preventive strategies of stroke studies among Health Professionals. The present study will explore the Attitude regarding the Knowledge and practice of healthcare workers on preventive strategies of stroke and this will complement the body of knowledge and promote further research on Stroke prevention.

## **Methodology**

This was a descriptive cross-sectional study conducted at Federal Medical Centre, Asaba<sup>14</sup>. The study participants were Health Care Workers; doctors, nurses, pharmacists, physiotherapists, radiographers, laboratory scientists, health attendants, Administrative staff, workers, and other Hospital workers. They were grouped into two for the study. Those who worked directly with the patients in the wards. They had responsibilities related to diagnosis and treatment. They were considered "Clinical Health Care workers". This represented the Doctors and the Nurses<sup>15</sup>. Those who did not work directly with the patients in the ward and had no responsibilities relating to diagnosis and treatment were considered "Non-clinical Health Care Workers". This represented others<sup>15</sup>.

The Health Care workers were sampled by using simple random sampling of systematic technique<sup>16</sup>. Purposive sampling of the non-probability method will be used in sharing the sample size. Doctors 290, Nurses 480, Pharmacists 52, physiotherapists 20, Radiographers 20, Lab science 44, Health attendants 50, and other non-clinical health workers 485, giving a total of 1441 Health care workers. The Inclusion criteria were:

- 1) Those who have been in the employment of Federal Medical Centre for not less than six months.
- 2) Those who were not in any way incapacitated.
- 3) Those who were willing to dispense information.
- 4) Those who gave consent and their confidentiality maintained. Those who did not give consent were excluded from the study.

### 3.5.1 SAMPLE SIZE CALCULATION

The sample was derived using Taro Yamane's formula<sup>17</sup> for sample size determination.

$$\frac{N}{1+N(e^2)}$$

Where e = level of precision = 0.05 N = population size = 335

n= sample size

$$\frac{N}{1+N(e^2)} =$$

$$= \frac{335}{1+335(0.0025)}$$

$$= \frac{335}{1+0.8375}$$

$$= \frac{335}{1.8375} = 182.31 \sim 182 + 10\% = 200.$$

Total= 200 which was the sample size

Systematic random sampling<sup>16</sup> was used for each of the workgroups. The sampling interval was derived using the formula below: Sample interval = a Total number of health workers/Sample size. From the total list of healthcare workers in the different categories, a sampling ratio was calculated for each category giving an Nth number of 3, n=200 sample size

N=1441 Total number of healthcare workers

Sampling fraction

200/1441

N= 0.1388

Doctors 290x 0.1388 = 40.25 approximate 40

Nurses=480x 0.1388=66.62  $\Omega$  67

Pharmacist 52x 0.1388=7.21  $\Omega$  7

Physiotherapist 20x 0.1388=2.78  $\Omega$  3

Radiographers 20x 0.1388=2.78  $\Omega$  3

Lab science 44x 0.1388= 6.11  $\Omega$  6

Health attendant=50x 0.1388=6.94  $\Omega$  7

Contract staffs = 485x 0.1388= 67.32  $\Omega$  67

1. Doctors – 290/40=7
2. Nurses-480/67=7
3. Pharmacist-52/7=7
4. Physiotherapist-20/3=7
5. Radiographers 20/3=7
6. Lab scientist 44/6=7
7. Health attendant 50/7=7
8. Other non-clinical staffs 485/67=7

Therefore every 7<sup>th</sup> Staff of the hospital in each category was recruited for the study until the total number was obtained.

#### DATA COLLECTION.

The study was conducted by using a semi-structured interviewer administered questionnaire<sup>13, 18, 19</sup>. The questionnaire was developed with the help of reviewed literature in the empirical review of the study. It will consist of three parts :( 1) Socio-demographic characteristics (age, gender, job designation, etc.), (2) Attitude of Health Care workers on Preventive Strategies of Stroke, symptoms or signs and its risk factors, (3) Knowledge of Health care workers on Preventive Strategies of stroke, symptoms or signs and its risk factors (4) Practice of Health care workers on Preventive Strategies of stroke, symptoms or signs and its risk factors. The nature and

purpose of the study were explained to each respondent and informed and written consent was obtained. The duration of the study was one month

For the convenience of analyses, the total number of questions to assess Attitude and knowledge were (9) and (10) respectively. The total number of questions to assess Practice was (11), each correct response was scored one (1), and for each wrong response zero (0). The total scores for each respondent were converted to percentage scores and a score of  $> 50\%$  was termed Good Attitude, knowledge, or Practice, and a score of  $< 50\%$  was categorized as poor Attitude, knowledge, or Practice.

#### METHOD OF DATA ANALYSIS

Data was screened for completeness, entered, and analyzed using Statistical Package for Social Sciences (SPSS V. 25.0). Univariate analysis was carried out as quantitative variables were presented using percentages and frequencies. Aggregate scores were calculated on Attitude, knowledge, and practice to know if Attitude, knowledge, and practice were high or low. Bivariate analysis was carried out between the socio-demographic variables of attitude, knowledge, and practice, using chi-square and p-value to determine the level of significance (set at  $P < 0.05$ ). **DURATION OF THE STUDY:** This study was carried out within a month.

#### ETHICAL ISSUES/CONSIDERATION

Ethical permission to conduct this research was obtained from the Research and Ethics Committee and the due processes in carrying out research in the hospital were maintained and no harm or discomfort to participants during the questionnaire distribution

**Privacy:** The privacy of the respondents was of utmost importance during the conduct of the research. The code of ethics was aimed at protecting the rights of the individuals who were used as subjects of the research. Respondents were not forced into participating in the research project.

**Maintenance of confidentiality:** the research subject names were withheld and information given was not divulged to other people but rather was treated with utmost secrecy and strictly for the research.

#### RESULTS

##### Socio-demographic characteristics of Respondents

We had a total number of 200 participants that met the inclusion criteria in our study. Their Ages ranged from 18 to 58 years (mean =  $36.20 \pm 10.60$ ). The majority of respondents 144 (72%) were aged above 30 years, 113 (56.5%) the participants were female, 126 (63%) were married, had completed tertiary education 193 (97.5%), and practiced Christianity as a religion 193(96.5%) (Table 1). About 109(54.5%) of them were Clinical Healthcare workers (Figure 1).

**Table1. Socio-demographic characteristics of the respondents**

| VARIABLE | FREQUENCY<br>(N = 200) | PERCENTAGE<br>100% |
|----------|------------------------|--------------------|
|----------|------------------------|--------------------|

## Research Article

**Gender**

|        |     |      |
|--------|-----|------|
| Male   | 87  | 43.5 |
| Female | 113 | 56.5 |

**Age1 (years)**

|       |     |    |
|-------|-----|----|
| <= 30 | 56  | 28 |
| >30   | 144 | 72 |

**Age (in Years)**

|       |    |      |
|-------|----|------|
| <20   | 5  | 2.5  |
| 21-30 | 55 | 27.5 |
| 31-40 | 68 | 34   |
| 41-50 | 47 | 23.5 |
| 51-60 | 25 | 12.5 |

**Marital Status**

|          |     |    |
|----------|-----|----|
| Single   | 68  | 34 |
| Married  | 126 | 63 |
| Divorced | 2   | 1  |
| Widowed  | 4   | 2  |

**Profession1**

|                                 |     |      |
|---------------------------------|-----|------|
| Clinical Healthcare workers     | 109 | 54.5 |
| Non-clinical Healthcare workers | 91  | 45.5 |

**Profession**

|                |    |    |
|----------------|----|----|
| Medical doctor | 40 | 20 |
|----------------|----|----|

## Research Article

|                                        |     |      |
|----------------------------------------|-----|------|
| Nurse                                  | 67  | 33.5 |
| Pharmacist                             | 7   | 3.5  |
| Lab scientist                          | 6   | 3    |
| Radiographers                          | 3   | 1.5  |
| Physiotherapist                        | 3   | 1.5  |
| Health attendants                      | 7   | 3.5  |
| Other Non-clinical Health care workers | 67  | 33.5 |
| <b>Education Level1</b>                |     |      |
| Poorly Educated                        | 7   | 3.5  |
| Tertiary Educated                      | 193 | 97.5 |
| <b>Educational Level</b>               |     |      |
| No formal education                    | 0   | 0    |
| Primary education                      | 3   | 1.5  |
| Secondary education                    | 4   | 2    |
| Tertiary education                     | 193 | 96.5 |
| <b>Religion</b>                        |     |      |
| Christianity                           | 193 | 96.5 |
| Muslim                                 | 3   | 1.5  |
| Traditional                            | 4   | 2    |

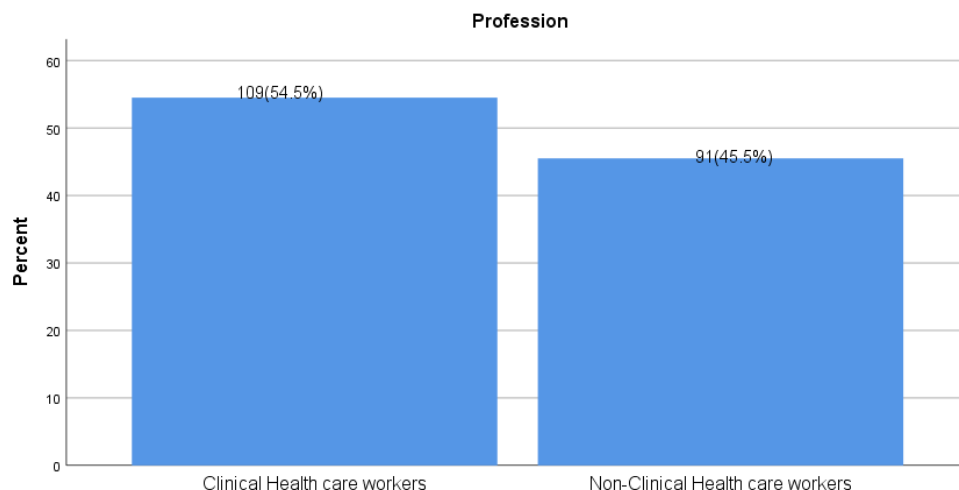


Fig1, Distribution of Healthcare workers

### Respondents' attitude on stroke Prevention

Although, the majority, 154(77.0%) of the 200 respondents have good aggregate attitudes towards stroke prevention. About 92.5% agreed that stroke is preventable. Of the specific attitudes towards stroke prevention, the findings showed that most respondents (91.5%) strongly agreed that stroke is treated in the hospital by a neurologist (83%), however will still explore the spiritual churches (71%) for healing, followed by traditional medicine healers 69%, and disagreed that food supplements (32.5%) and chemist shops 41% are not the best practice. However, more than ninety-six percent of the respondents believe that good family support enhances early recovery (Table 2).

**Table2. Attitude of Respondents on Stroke and its Prevention**

| ATTITUDE<br>(%) | QUESTIONS                                                   | YES (%) |    | NO |
|-----------------|-------------------------------------------------------------|---------|----|----|
|                 |                                                             | 70      | 30 |    |
|                 | Do you think people who have a stroke can live a happy life |         |    |    |
|                 | Do you think family care is helpful for early recovery of   |         |    |    |



|                                                                |                  |                    |
|----------------------------------------------------------------|------------------|--------------------|
| Stroke patients after discharge                                | 96               | 4                  |
| Do you think people with stroke can be reemployed in their job | 75               | 25                 |
| Stroke is a preventable disease                                | 92.5             | 7.5                |
| Stroke patients should be treated by a Neurologist             | 83               | 17                 |
| Stroke can be treated in a chemist shop                        | 41               | 59                 |
| Stroke patients can be treated with food supplements           | 32.5             | 67.5               |
| Stroke can be treated in spiritual churches                    | 71               | 29                 |
| Stroke can be treated by traditional Medicine Healers          | 69               | 31                 |
| <b>Aggregate score on Attitude of Healthcare workers</b>       | <b>Frequency</b> | <b>percent (%)</b> |
| Good                                                           | 154              | 77                 |
| Poor                                                           | 46               | 23                 |

**Respondents' knowledge of stroke:** Although, the majority, 168 (84.0%) of the 200 respondents have good aggregate knowledge about stroke, about 87.5 % knew stroke as a disease of the blood vessels in the brain and also preventable (93.5%), however about less than half (48%) of them believe that stroke is a curable disease (Table 3).

**Table3. Knowledge of Stroke and its Prevention among respondents**

| KNOWLEDGE QUESTIONS                                       | YES (%)          | NO (%)             | Is stroke a disease |
|-----------------------------------------------------------|------------------|--------------------|---------------------|
| of the blood vessels of the Brain?                        | 87.5             | 12.5               |                     |
| Is Stroke a Preventable disease?                          | 93.5             | 6.5                |                     |
| Can one have a stroke more than once?                     | 83               | 17                 | Does stroke affect  |
| daily activities like driving a car,                      |                  |                    |                     |
| dressing, having a job, etc                               | 95.5             | 4.5                |                     |
| Is Stroke a disease requiring urgent care?                | 94.5             | 5.5                |                     |
| Stroke is a disabling disease                             | 63               | 37                 |                     |
| Stroke is a curable disease                               | 48               | 52                 |                     |
| Stroke is an old man's disease                            | 93.5             | 6.5                |                     |
| Stroke is a contagious disease                            | 2                | 98                 |                     |
| Stroke a hereditary disease                               | 78.5             | 21.5               |                     |
| <b>Aggregate score on Knowledge of Healthcare workers</b> | <b>Frequency</b> | <b>percent (%)</b> |                     |
| Good                                                      | 168              | 84                 |                     |

Poor 32 16

**Respondent's knowledge of the signs or symptoms of stroke:** The majority, 144 (72.0%) of the 200 respondents had good knowledge of the signs or symptoms of a stroke. The signs or symptoms of stroke most commonly known to the respondents include sudden weakness or paralysis on one side of the body (88.5%), sudden loss or reduced sensation all over the body (76%), sudden loss or reduced sensation on one side of the body (73.5%). More than half of respondents (73.0%) had sudden severe Headaches, sudden dizziness or loss of balance or coordination (66.0%), and sudden loss of vision (60.0). (Table 4)

**Table4. Respondent's knowledge of stroke symptoms or warning signs**

| Stroke Symptoms or signs                                       | Yes (%) | No (%) |
|----------------------------------------------------------------|---------|--------|
| Sudden loss of vision                                          | 60      | 40     |
| Sudden loss or reduced sensation on one side of the body       | 73.5    | 26.5   |
| Sudden dizziness or loss of balance or coordination            | 66      | 34     |
| Sudden and severe headache                                     | 73      | 27     |
| Sudden weakness or paralysis on one side of the body           | 88.5    | 11.5   |
| Sudden loss or reduced sensation all over the body             | 76      | 24     |
| <b>Aggregate Knowledge of stroke warning signs or symptoms</b> |         |        |
| Good                                                           | 144     | 72     |
| Poor                                                           | 56      | 28     |

**Respondent's knowledge of stroke risk factors:** The majority, 156 (78.0%) of the 200 respondents had good knowledge of stroke risk factors. The stroke risk factors most commonly known to the respondents include hypertension (93.0%), being overweight or obese (76.0%), excessive alcohol intake (75.5%), cigarette smoking (74.5%), and diabetes mellitus (73.5%). More than half of respondents knew aging (62.0%) as a stroke risk factor (Table 5).

**Table5. Respondent's knowledge of stroke risk factors**

| Stroke Risk factors                               | yes (%) | No (%) |
|---------------------------------------------------|---------|--------|
| Excessive alcohol intake                          | 75.5    | 24.5   |
| Diabetes Mellitus                                 | 73.5    | 26.5   |
| Cigarette smoking                                 | 74.5    | 25.5   |
| High Blood Pressure (Hypertension)                | 93.0    | 7      |
| Advancement in Age                                | 62      | 38     |
| Being overweight or obese                         | 76      | 24     |
| <b>Aggregate Knowledge of stroke risk factors</b> |         |        |
| Good                                              | 156     | 78     |

Poor 44 22

### Respondents' stroke prevention practices:

The aggregate practice of stroke prevention among healthcare workers was poor (54%). Most of the respondents observed that stroke prevention practices such as taking the patient to the hospital on the slightest suspicion of stroke or its warning sign (91.5%) and reduction in alcohol intake (75.7%) were important, while less than half of them will check their Blood pressure (30.0%) regularly or check their blood sugar (46%) regularly for those who are diabetics or counsel others to do so. The same with healthcare workers (43.5%) who control their cholesterol or advise others to do so and also for those who try to lose weight (46.5%) or advise others regularly to do so. About one-third (39%) of the respondents do regular exercise (Table 6).

**Table6. The practice of Stroke Prevention among respondents**

| PRACTICE QUESTIONS                                                                                   | YES (%)          | NO (%)             |
|------------------------------------------------------------------------------------------------------|------------------|--------------------|
| What will you do if you happen to witness a person with a stroke?<br>(Sprinkle water over the face)  | 11               | 89                 |
| What will you do if you happen to witness a person with a stroke?<br>(Take him/her to the Hospital)  | 91.5             | 8.5                |
| What will you do if you happen to witness a person with a stroke?<br>(Wait for spontaneous recovery) | 14.5             | 85.5               |
| What will you do to prevent stroke, please specify                                                   | 43.5             | 56.5               |
| Are you aware of the options for stroke management                                                   |                  |                    |
| eg Acute Management                                                                                  | 30               | 70                 |
| Are you aware of the options for stroke management eg Surveillance                                   | 39               | 61                 |
| Are you aware of the options for stroke management eg Rehabilitation                                 | 46.5             | 53.5               |
| Are you aware of the options for stroke management eg Prevention                                     | 46               | 54                 |
| Are you aware of one of the methods of recovery like Physiotherapy                                   | 84.5             | 15.5               |
| Are you aware of one of the methods of recovery like Speech therapy                                  | 69               | 31                 |
| Are you aware of this method of recovery like Physiotherapy?<br>& speech therapy together            | 64.5             | 35.5               |
| <b>Aggregate score on practice of Healthcare workers,</b>                                            | <b>Frequency</b> | <b>percent (%)</b> |
| Good                                                                                                 | 92               | 46                 |
| Poor                                                                                                 | 108              | 54                 |

**HealthCare Workers relationship with Attitude, knowledge, and practice of stroke prevention.**

There was a significant association ( $p < 0.0001$ ) of good knowledge of stroke by Clinical Healthcare workers [Chi-squares =27.1, 95%CI= (0.029-0.256)] when compared with non-clinical healthcare workers. This is in contrast with their poor practice of stroke prevention (Chisquares=3.570,  $p = 0.02$ , 95%CI (0.321-1.023). However, there was no significant association ( $p=0.423$ ) between the good attitude toward stroke prevention by the Clinical Health care workers [Chi-square=0.130, 95%CI= (0.458-1.713)], when compared with Non-Clinical Health care workers (Table 7).

**Table7. Healthcare worker's relationship with Attitude, knowledge, and practice of Stroke Prevention**

| Variables                                                                      | Good attitude (%)  | Poor attitude (%)  | Chi-square | P-value | 95%CI         |
|--------------------------------------------------------------------------------|--------------------|--------------------|------------|---------|---------------|
| Clinical Healthcare workers                                                    | 85(78)             | 24(22)             | 0.130      | 0.423   | (0.458-1.713) |
| Non-clinical Healthcare workers                                                | 69(75.8)           | 22(24.2)           |            |         |               |
| <b>Healthcare worker's relationship with knowledge of stroke prevention</b>    |                    |                    |            |         |               |
| Variables                                                                      | Good knowledge (%) | Poor knowledge (%) | Chi-square | P-value | 95%CI         |
| Clinical Healthcare workers                                                    | 105(96.3)          | 4(3.7)             | 27.1       | 0.0001  | (0.029-0.256) |
| Non-clinical Healthcare workers                                                | 63(69.2)           | 28(30.8)           |            |         |               |
| <b>Healthcare worker's relationship with the practice of stroke prevention</b> |                    |                    |            |         |               |
| Variables                                                                      | Good Practice (%)  | Poor Practice (%)  | Chi-square | P-value | 95%CI         |
| Clinical Healthcare workers                                                    | 49(45.0)           | 60(55.0)           | 3.570      | 0.02    | (0.321-1.023) |
| Non-clinical Healthcare workers                                                | 29(31.9)           | 62(68.1)           |            |         |               |

**Discussion**

Stroke is a distressing issue in low-income countries than the middle and high-income countries of the world<sup>20</sup>, and it is thought as the primary cause of morbidity and death among noncommunicable diseases. Stroke can be averted and managed if its risk factors are altered and if warning signs are discovered earlier<sup>20</sup>. A good understanding of knowledge and attitude towards stroke risk factors are essential for early stroke prevention<sup>8</sup>.

In our study the majority of respondents (72%) were aged above 30 years, (56.5%) of the participants were female, (63%) were married, and (96.5%) had completed tertiary education. However, in another study conducted among hypertensives in a rural population in Saudi Arabia<sup>13</sup>, most respondents were males, younger adults, not married, had a college degree or above, and almost half of them controlled their blood pressure. However, our study was conducted in an urban area among Healthcare workers of whom (93%) knew hypertension was a risk factor for stroke and was above 30 years (72%) of age. In the Kingdom of Saudi Arabia Hypertension was also at high risk in males and this may not be unconnected with the difference in health-seeking behaviors among genders in the two environments. They found that hypertension sharply increases with age and other combinations of cardio-metabolic risk factors<sup>21</sup>. In this study majority, (84.0%) of the 200 respondents have good aggregate knowledge about stroke, 87.5 % knew stroke was a disease of the blood vessels in the brain and also preventable (93.5%), it revealed that Healthcare workers had good aggregate Knowledge of risk factors (78%) or symptoms (72%). This is consistent with other studies done in Sokoto Nigeria, where about (86.6%) of the respondents had good knowledge of stroke risk factors and symptoms (87%)<sup>8</sup>. The majority (87.4%) of them knew stroke as a disease of the blood vessels in the brain. This is uniform with other studies in Africa, like in Benin, Nigeria<sup>22</sup> and Cameroon<sup>23</sup> where they described the general public's level of knowledge on stroke in Benin City and Yaoundé as good. However, in the studies done in the Kingdom of Saudi Arabia<sup>13,24</sup>, most respondents had a poor level of knowledge about stroke prevention, risk factors, symptoms, and stroke complications. Other studies in support of their findings were done in Iran<sup>25</sup> and Brazil<sup>26</sup>. These disparities in their knowledge of stroke risk factors and warning signs may be due to differences in the studied populations; - in terms of community or hospital-based studies, their different levels of perceptions based on their levels of education, traditional beliefs, and religious inclinations. About 97.5% of Healthcare workers in our study had a tertiary education as opposed to 73.5 % of respondents in a community-based study in Saudi<sup>13</sup> who had a college education or above. In the Iran study about 62.9% were poorly educated and may not recognized these signs and symptoms and in Brazil about 25% had tertiary education, only 29.03% of them could mention 2 or 3 stroke risk factors. Another possible explanation for these results is that most respondents here may lack information due to insufficient awareness campaigns about stroke prevention and its risk factors and warning signs. The significant education gap may have created major difficulties for them to access enough knowledge.

Although, the majority, 154(77.0%) of the 200 respondents in the current study have good aggregate attitudes towards stroke prevention. However, there was no significant association ( $p=0.423$ ) between the good attitude toward stroke prevention by the Clinical Health care workers [Chi-square=0.130, 95%CI= (0.458-1.713)], when compared with Non-Clinical Health care workers. Most of them (91.5%) strongly agreed that stroke is treated in the hospital by a neurologist (83%), however will still explore the spiritual churches (71%) for healing, followed by traditional medicine healers 69%. Of course, they (54%) had a poor aggregate practice of stroke prevention. However, the study in Saudi established that most respondents had poor attitudes towards monitoring their blood

pressure, early diagnosis<sup>13</sup>, treating heart disease, and smoking cessation to prevent stroke. Some other studies showed most hypertensive participants had a neutral attitude toward stroke prevention approaches<sup>27</sup>. Another study conducted in India showed a relatively higher attitude score of hypertensive people than non-hypertensive people towards stroke prevention<sup>28</sup>. They concluded that the poor knowledge and attitude of respondents may influence their behaviors toward stroke prevention.

In Brazil<sup>30</sup>, Workers with tertiary education levels had significantly more knowledge about stroke than those with poor education. Workers' attitudes towards stroke prevention are overall good at 81.4%. Their belief in a supernatural or mystical origin witnessed there and in studies performed in Ivory Coast (50.9%)<sup>31</sup> and in Burkina Faso (15%)<sup>32</sup>, could be explained by traditional notions of disease in African societies, which often point to a mystical origin to the disease. The study in

Enugu North Nigeria<sup>18</sup> is also in tandem with our findings that most of the respondents had an incorrect attitude and poor practice toward stroke prevention. They still believed that spiritual healers (yes=61.1%, don't know=14.9%) and traditional medicine healers (yes=48.2%, don't know=16.6%) could treat stroke. These conflicting attitudes will prevent the early presentation of stroke patients to the hospital even if they recognize the risk factors or warning signs. This is a mismatch between practice and knowledge of stroke management due to contradictory attitudes. This result is consistent with another study conducted in a tertiary care hospital in Pakistan which indicated that stroke prevention practices were sub-optimal<sup>29</sup>

### Limitations.

This was a hospital-based study conducted in an urban location and therefore is not representative of a multi-centre or community-based study. The structured questions with "yes" or "no" answers in our questionnaire did not ascertain the reasons why patients hold a convinced outlook about stroke.

### Conclusion

Findings from this study show that conflicting attitudes toward a good knowledge of stroke prevention influence the practice of stroke prevention negatively with adverse consequences. Therefore, improvement in health educational systems and behavior-changing strategies for healthcare professionals, and urban and rural dwellers is essential to increase general public awareness about stroke prevention and other health-related affairs.

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