

# Awareness of Stroke Risk Factors and Preventive Health Practices among Federal Civil Servants in Ogun State, Nigeria

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## ABSTRACT

**Background:** Stroke is a growing public health problem worldwide. It is most especially common among regions with limited resources and high disease burden with low per capita income such as Nigeria, where 60% of the Nigerian populace lives below 40% of the poverty line. Civil servants form a significant population of the vulnerable group at risk of stroke in Nigeria. Hence this study aims to investigate stroke awareness, its risk factors and preventive health practices of stroke among federal civil servants in Ogun State, Nigeria.

**Methods:** Study utilized a work-place based survey design, adopting a systematic randomized sampling technique to recruit 400 participants for this study. A self-designed questionnaire was used to elicit information from the respondents. 384 questionnaires were retrieved and analyzed using SPSS 20.0 version.

**Results:** Majority (91.9%) of the respondents have heard about stroke. However, they lack adequate information on some associated health risk factors attributed to stroke. Also, stroke preventive health practices among the respondent is poor. Although more than half (60.7%) of the respondents said they carryout routine medical check-up, their practice of dietary intake is inadequate. There is a statistical difference ( $P < 0.05$ ) between respondent's level of education and awareness of stroke.

**Conclusions:** Awareness of risk factors of stroke and preventive practices is low. This indicates an urgent need for intensified programs on awareness campaigns and public education on stroke, its risk factors and various preventive health practices of stroke in order to reduce the burden of stroke in Nigeria.

**Keywords:** Awareness, stroke, risk factors, preventive health practices, federal civil servants.

## INTRODUCTION

The World Health Organization (WHO) defines stroke as rapidly developing clinical signs of focal (or global) disturbance of cerebral functions with symptoms lasting 24hours or longer or leading to death, with no apparent cause other than of vascular origin. <sup>(1)</sup> As a vascular disease of the brain, it affects both men and women mostly within the age

range of 25 and 65years, with about 15million new cases diagnosed in 2004. <sup>(2)</sup> However, it is estimated that 23 million new cases of stroke would be diagnosed by year 2030 if no significant global public health response is achieved. <sup>(3)</sup> Hence, stroke continues to be regarded as a major global health problem. <sup>(4)</sup> This is because stroke imposes the greatest burden of Disability-Adjusted Life Years (DALYs) when

compared with other neurological disorders. (5) According to WHO, the burden of stroke is projected to globally increase from 38 million DALYs lost in 1990 to 61 million DALYs in 2020. (6)

However, findings obtained from the Global Burden of Diseases study showed that although the age standardized rates of stroke mortality has decreased worldwide over the past two decades, there is a significant increase in the number of people affected by stroke worldwide between 1990 and 2013. (4) As opposed to the WHO's projections of year 2020, in 2013, there were almost 25.7 million stroke survivors (71% with Ischemic stroke), 6.5million deaths (51% Ischemic stroke) 113 million DALYs lost due to stroke (58% Ischemic stroke) and 10.3 million new strokes (67% Ischemic). (4)

These high incidence rates have largely been attributed to growth of the population, ageing population and numerous transitions in health sector which has been observed in both developed and developing countries. (7) Nevertheless, majority of this stroke burden (75.2% of global deaths from stroke and 81% of global stroke-related DALYs) occurred in developing countries due to increased rate of undetected cases of hypertension as well as poorly controlled arterial hypertension. (8-10) In Nigeria, there still remains dearth in number of studies examining the incidence of stroke, (3) although evidence has shown an age standard annual stroke incidence rate in Africa to be 316 per 100,000 population, (11) of which Nigeria being Africa's most populous country features prominently. However, few published studies conducted in Nigeria have shown that the knowledge of stroke and its risk factors is low (12,13) and where the awareness exists, its preventive health practices is poor due to the fact that large proportions of Nigerians are still living in Poverty. (13)

Prevention of new stroke cases has been identified as the main solution to the growing stroke burden. (4) These preventive strategies of stroke as included in major

Cerebro-Vascular Disease guidelines includes: modification of lifestyle and reduction of behavioral risks such as unhealthy diet, physical inactivity, tobacco & alcohol use and obesity; early detection and prompt management of elevated blood pressure; management of any medical condition that could lead to atherosclerosis and reduction of exposure to air pollution. (4) In addition, body of evidence has also identified that aggressive lowering of systolic blood pressure to less than 130mmHg is another important target for stroke prevention even in people with only borderline hypertension. (15) The reduction of behavioral and other modifiable risk factors of stroke is feasible, improves health outcome, and reduces health care cost. (4,16) Ultimately, it reduces both the burden of stroke and individual's risk of stroke by 80%. (4)

Despite these benefits identified, in Nigeria, the word stroke continues to be shrouded by mysticism, misconception, misinformation and mismanagement. Also irrespective of religion, education, ethnicity or social status of the Nigerian populace, it has been observed that many would rather prefer to visit a traditional or alternative health care other than seeking orthodox medical assistance for proper management. Sometimes, this could result into a more complicated situation and eventually leads to death. Therefore, it is relevant to change the public knowledge of stroke and practice of its prevention in order to improve access to better care and proper management.

Stroke has been identified to be common among regions with limited resources and high disease burden with low per capita income (17) such as Nigeria, where more than half of the Nigerian populace lives below 40% of the poverty line. Civil servants form a significant population of the vulnerable group at risk of stroke in Nigeria. Hence, this study aims to assess level of awareness of stroke, its risk factors and preventive health practices among federal civil servants in Ogun State, Nigeria.

## OBJECTIVES

1. To examine the level of awareness of stroke and its risk factors among federal civil servants in Ogun State, Nigeria.
2. To investigate strokes preventive health practices among federal civil servants in Ogun State, Nigeria.
3. To compare the level of significance between respondent's level of education and awareness of stroke.

## METHODS

**Table 1: Demographic characteristics of the respondents**

Age (Years)	Frequency (n= 384)	Percentage (100%)
21 – 25	22	5.7%
26 – 30	11	2.9%
31 – 35	43	11.2%
36 – 40	53	13.8%
41 – 50	127	33.1%
51 – 55	96	25%
56 – 60	32	8.3%
Gender	Frequency (n= 384)	Percentage (100%)
Male	213	55.5%
Female	171	44.5%
Education	Frequency (n= 384)	Percentage (100%)
Primary	22	5.7%
Secondary	10	2.6%
College	11	2.9%
Polytechnic	128	33.3%
University	202	52.6%
Post Graduate	11	2.9%
Marital Status	Frequency (n= 384)	Percentage (100%)
Single	64	16.7%
Married	309	80.5%
Separated	11	2.9%
Religion	Frequency (n= 384)	Percentage (100%)
Christianity	307	79.9%
Islam	66	17.2%
Traditional	11	2.9%
Ethnic Group	Frequency (n= 384)	Percentage (100%)
Igbo	11	2.9%
Hausa/Fulani	33	8.6%
Yoruba	330	85.9%
Others	10	2.6%
Profession	Frequency (n= 384)	Percentage (100%)
Account Officer	54	14.1%
Technical Officer	64	16.7%
Admin Officer	76	19.8%
Others	131	34.1%
Educational Officer	40	10.4%
Town Planner	10	2.6%
Security Officer	9	2.3%
Level of Employment	Frequency (n= 384)	Percentage (100%)
GL 1-3	11	2.9%
GL 4-6	43	11.2%
GL 7-9	129	33.6%
GL 10-12	82	21.4%
GL 13-15	119	31.0%
Income	Frequency (n= 384)	Percentage (100%)
Below 49,000	42	10.9%
50,00 – 99,000	169	44.0%
100,000-149,000	64	16.7%
150,000-190,000	88	22.9%
200,000 above	21	5.5%

GL: Grade Level

This study utilized a work-place based cross sectional survey design to assess

the level of awareness of stroke, its risk factors and preventive health practices among federal civil servants. A systematic random sampling technique was used to recruit 400 participants within the age bracket of 20-60 years and works at Federal Secretariat Office Complex, Ogun State. After obtaining ethical approval, informed consent was gained from participants. Self-designed questionnaires were administered and a guideline on how to complete the questionnaires was explicitly explained. Completed questionnaires were retrieved the same day. Data analysis was done using Statistical Package of Social Sciences (SPSS 20.0. version). Data was presented using tables and percentages. Inferential statistics of chi-square was used to test the hypothesis at a significant level of 0.05.

Table 1 above showed that 33.1% and 25% of the respondents are within the ages of 41-50 and 51-55 years. 55.5% respondents are males while 44.5% respondents are females. 52.6% respondents are university graduates while 33.3% respondents graduated from a polytechnic. Majority of the respondents 80.5% are married. 85.9% respondents are of the Yoruba ethnic group while 8.6% are Hausa's and Fulani's. 33.6% and 31.0% respondents are between level 7-9 and 13-15 of the employment cadre. 44.0% and 22.9% respondents receive a monthly income of N50, 000-N99, 000 and N150, 000-N190, 000 respectively.

Table 2 showed responses of the participants on the level of awareness of stroke. 91.9% of the respondent confirmed that they have heard about stroke. 61.2% said their source of information was by seeing someone with stroke. 64% of the respondents identified the brain as major organ affected. In the assessment of symptoms suggestive that someone is beginning to develop stroke, 83.3% respondents agreed that the individual will experience pounding heartbeat, dizziness 74.7%, difficulty in breathing 77.9% and altered consciousness 91.9%, difficulty in speech 97.1%, chest pain 94.5%, weakness

on any part of the body 94%, loss of vision 97.4%, severe headache or migraine 97.4%, fainting attack and collapse 94.3% and high blood pressure 97.4%.

**Table 2: Participant's responses on the awareness of stroke**

Items	Frequency (n= 384)	Percentage (100%)
Have you ever heard about stroke before?		
Yes	353	91.1%
No	31	8.1%
If yes, what was the source of information?		
(a) I have seen some one with stroke	235	61.2%
(b) Friend	43	11.2%
(c) I have read about it	31	8.1%
(d) Family member	22	5.7%
(e) I learnt about it in school	0	0%
(f) Health facility	21	5.5%
(g) Mass Media	21	5.5%
(i) I can't remember	11	2.9%
In which organs(s) does stroke occur?		
a. Brain	249	64.8%
b. Heart	72	18.8%
c. Kidney	11	2.9%
d. Bones	21	5.5%
e. Spinal cord	20	5.2%
f. Blood	11	2.9%
What symptoms suggest that someone is beginning to develop a stroke? (multiple choice option responses)		
a. Pounding Heart beat	320	83.3%
	64	16.7%
b. Dizziness	287	74.7%
	97	25.3%
c. Difficulty in Breathing	299	77.9%
	85	22.1%
d. Altered/Poor Consciousness	353	91.9%
	31	8.1%
e. Slurring difficulty of speech	373	97.1%
	11	2.9%
f. Chest pain	363	94.5%
	21	5.5%
g. Weakness on any part of the body	361	94%
	23	6%
h. Loss of vision	374	97.4%
	10	2.6%
i. Severe headache/migraine	374	97.4%
	10	2.6%
j. Fainting attack and collapse	362	94.3%
	22	5.7%
k. High blood pressure	374	97.4%
	10	2.6%
What are the symptoms of stroke?		
a. Headache with neck stiffness	50	13%
b. Sudden loss difficulty of speech	132	34.3%
c. Sudden weakness on one side of the body	106	27.6%
d. Chest pain and difficulty in breathing	32	8.3%
e. Confusing general disorientation	32	8.3%
f. Sudden loss of sense of balance (vertigo)	22	5.7%
g. Sudden loss of sight in or both eye	4	1.04%
h. Transient loss of memories forgetfulness	6	1.56%
i. Sudden loss of the ability to swallow	0	0%
j. Collapse and loss of consciousness	0	0%

Table 3 above reveals the participants responses on the risk factors of stroke. 83.3% said cigarette smoking can cause stroke, unhealthy diet 77.9%, spiritual attack 70.8%, lack of good daily exercise 97.4%, kolanut and other stimulants e.g.

jeddi, opa-eyin, paraga and snuffs 89.1%, coffee/caffeine stimulant 98.2%, aphrodisiacs 83.3%, alcohol consumption 77.9%, and indiscriminate use of over the counter medication 73.2% respondents.

**Table 3: Responses on causes or conditions that can put someone at risk to developing stroke**

Predisposing factors	Frequency (384)	Percentage (100%)
Cigarette smoking	320	83.3%
Yes	64	16.7%
No		
Overbearing stress	0	0%
Yes	0	0%
No		
Unhealthy diet	299	77.9%
Yes	85	22.1%
No		
High blood pressure	0	0%
Yes	0	0%
No		
High blood cholesterol	0	0%
Yes	0	0%
No		
Diabetes Mellitus	0	0%
Yes	0	0%
No		
Spiritual attack	272	70.8%
Yes	112	29.2%
No		
Repercussion of sin	0	0%
Yes	0	0%
No		
Previous history of stroke	0	0%
Yes	0	0%
No		
Personal history of heart disease	0	0%
Yes	0	0%
No		
Older age (> 60 years)	0	0%
Yes	0	0%
No		
Family history of stroke	0	0%
Yes	0	0%
No		
Lack of good daily exercise	374	97.4%
Yes	10	2.6%
No		
Kolanut and other stimulants e.g. jeddi, opa-eyin, paraga, snuffs	342	89.1%
Yes	42	10.9%
No		
Coffee/caffeine stimulant	377	98.2%
Yes	7	1.8%
No		
Aphrodisiacs (drugs for enhancing sexual performance)	320	83.3%
Yes	64	16.6%
No		
Alcohol consumption	299	77.9%
Yes	85	22.1%
No		
Indiscriminate use of over counter medication	281	73.2%
Yes	103	26.8%
No		

**Table 4: Participants responses on consequences of stroke and preferred choice of treatment**

Items	Frequency(n= 384)	Percentages (100%)
What are the consequences of stroke? (multiple choice response options)		
Loss of speech	266	69.3%
Yes	118	30.7%
No		
Loss of sight	321	83.6%
Yes	63	16.4%
No		
Frail health and well-being	226	69.3%
Yes	118	30.7%
No		
Loss of the ability to walk	341	88.8%
Yes	43	11.2%
No		
One sided paralysis	353	91.9%
Yes	31	8.1%
No		
Loss of economic power	373	97.1%
Yes	11	2.9%
No		
Loss of ability of hearing	225	58.6%
Yes	159	41.4%
No		
Re- learning necessity	374	97.4%
Yes	10	2.6%
No		
Loss of bowel or bladder control	374	97.4%
Yes	10	2.6%
No		
What will you do, in cases where you or a relative is experiencing symptoms suggestive of stroke?		
Go to the chemist shop	33	8.6
Call a Nurse	43	11.2
Go to a hospital	254	66.1
Take medications to relieve symptoms	22	5.7
Call an ambulance	0	0
Go to a specialist doctor	0	0
Go to a traditional healer	11	2.9
Consult friends for advice	0	0
Wait to allow symptoms to resolve on its own	0	0
Use traditional herbs	21	5.5
Allow my relatives to decide	0	0
Seek spiritual help	0	0
Use nutritional supplement	0	0

What is your preferred choice of treatment?			
Spiritual /church healing	Yes	53	13.8%
	No	331	86.2%
Traditional healer	Yes	32	8.2%
	No	352	91.7%
Hospital based treatment	Yes	277	72.1%
	No	107	27.9%
Home based relative/friends intervention	Yes	0	0
	No	0	0
I don't know	Yes	22	6.7%
	No	362	93.3%

Table 5: responses on preventive practices of stroke

Items	Frequency (n=384)	Percentage (100%)
Do you go for routine medical check-up/medical examination? Yes	233	60.7%
No	151	39.3%
How often do you go for medical checkup?		
Monthly	44	11.5%
Bi-Monthly	133	34.6%
Quarterly	14	3.64%
Every 6 months	17	4.42%
Yearly	25	6.51%
Occasionally	130	33.9%
Not at all	21	5.5%
Do you smoke or take snuffs or eat kolanut or use any tobacco product? Yes	29	7.6%
No	355	92.4%
Do you take any alcoholic drink or beverage? Yes	128	33.3%
No	256	66.7%
How often do you take alcoholic drink or beverage?		
Daily	33	8.6%
Weakly	42	10.9%
Monthly	11	2.9%
Occasionally	65	16.9%
When necessary	54	14.1%
Yearly	104	27.1%
Not at all	75	19.9%
Do you take carbonated drink or beverage? Yes	151	39.3%
No	233	60.7%
How often do you take carbonated drink?		
Daily	76	19.8%
Weakly	31	8.1%
Monthly	22	5.7%
Occasionally	117	30.5%
When necessary	85	22.1%
Yearly	31	8.1%
Not at all	22	5.7%
Do you take caffeinated beverages? Yes	158	41.1%
No	226	58.9%
Do you eat red meat, fatty meat, organ meat, poultry meat and cheese? Yes	296	77.1%
No	88	22.9%
Do you eat any of the confectionaries like cake, meat pie, butter bread, sweet snacks? Yes	328	85.4%
No	56	14.6%
Do you eat vegetables, fruits and nuts as part of your diet? Yes	110	28.6%
No	274	71.4%
Have you ever undergone a blood lipid check? Yes	46	12.1%
No	338	87.9%
How often do you check your blood sugar level?		
Weekly	33	8.6%
2 weeks	135	35.2%
Monthly	33	8.6%
Two monthly	21	5.5%
Quarterly	87	22.7%
Every six month	65	16.9%
Yearly	10	2.6%
Not at all	10	2.6%
How often do you check your blood pressure?		
Daily	96	25.0%
Weekly	64	16.7%
2 week	32	8.3%
Monthly	43	11.2%
2 month	64	16.7%
Quarterly	65	16.9%
Every six month	20	5.2%
Do you participate in sport activities/exercise? Yes	183	47.7%
No	200	52.3%



Table 4 above showed the participants responses on consequences of stroke and their preferred choice of treatment. Many of the respondents are aware of consequences of stroke as shown above. Although majority of the respondents 72.1% said they will prefer being treated in the hospital, however 13.8% said they prefer spiritual or church healing; 8.3% prefers traditional healing while 6.7% respondents indicated that they don't know their choice of treatment.

Table 5 above shows the participant's responses on preventive health practices of stroke. Many of the respondents 60.7% said they go for routine medical check-up. Also 7.6% of the respondents said they smoke, take snuff, eat kolanut and use

tobacco products. 33.3% respondents said they take alcoholic drinks and beverages while 19% respondents do not take alcohol. 39.3% respondents take carbonated drinks, 77.1% respondents eat red meat, organ meat, poultry meat and cheese. 85.4% eat confectionaries. However, it is alarming to know that out of 384 respondents, 28.6% eat vegetables, fruits and nuts as part of their diet while 71.4% said no. In addition, only 12.1% respondents said they have undergone blood lipid profile check. 35.2% respondents said they check their blood sugar 2 weekly while 25% said they check their blood pressure daily. 47.9% respondents said they participate in sport activities and also exercise.

Table 6: Test of Hypothesis

LEVEL OF EDUCATION OF RESPONDENTS	Are you aware of stroke?		STATISTICAL TEST
	YES	NO	
Primary	11(2.86%)	11(2.86%)	X <sup>2</sup> = 99.29 df= 5 P< 0.0001
Secondary	10(2.60%)	0(0%)	
College	11(2.86%)	0(0%)	
Polytechnic	118(30.7%)	10(2.60%)	
University	202(52.6%)	0(0%)	
Post graduate	11(2.86%)	0(0%)	

X<sup>2</sup>= Chi-square value, df= degree of freedom

Table 6 above provides a statistical test on the level of significance between respondent's level of education and awareness of stroke. Result above shows a significant difference (P<0.05) between level of education of the respondents and awareness of stroke.

## DISCUSSION

400 participants were recruited for the purpose of this study; however 384 participants completed the questionnaires administered and returned it the same day. The results showed that majority 91.9% of the respondents have heard about stroke. Major source of information identified was by seeing an individual suffering from stroke (61.2%). Also 64% of the respondents identified the brain as the major organ affected by stroke.

It is noteworthy to observe that some risk factors which could predispose an individual to stroke as identified by the

respondents includes alcohol consumption (77.8%), aphrodisiacs (83.3%), cigarette smoking (83.3%), coffee/caffeine stimulant (77.4%), kolanut and other herbal stimulant such asjeddi, opaeyin, paraga (89.1%). However, stroke was viewed as being caused by evil spirit (70.5%). In addition, none of the respondents mentioned stress, hypertension, high blood cholesterol, diabetes, age, previous and family history of stroke as major risk factors of stroke. This shows that they lack adequate information on some associated health risk factors attributed to stroke. This result is similar to the findings of a study conducted in Nigeria which observed that the baseline knowledge of stroke among adults is poor. (13) Study also recommended that the development of educational strategies to enlighten the general public about stroke is important since ignorance of stroke risk factors and inability to control these risk factors could contribute to high prevalence of stroke

among blacks.

Some of the consequences of stroke as identified by the respondents includes loss of speech (69.3%), loss of sight (83.6%), frail health and well-being (69.3%), loss of ability to walk (88.8%), one sided paralysis (91.9%), loss of economic power (97.1%), loss of ability to hear (58.6%), re-learning necessity (97.4%), and loss of bowel and bladder control (97.4%). Although majority of the respondents (72.1%) prefers a hospital-based treatment of stroke, some of the respondents still prefer spiritual or church healing (13.8%) and traditional healing (8.3%) as a choice of treatment. The choice of treatment of stroke in Nigeria could be influenced by some cultural and religious beliefs. <sup>(12)</sup>

The preventive health practices of stroke among the respondent is poor. Although more than half (60.7%) of the respondents said they carryout routine medical check-up, their practice of dietary intake is inadequate. Also only 47.9% respondents participate in exercise and sports activities. This indicates the need for a more pragmatic and comprehensive approach which targets not only the primary prevention of stroke in individuals who are at risk of cerebro-vascular disease <sup>(4)</sup> but also targets other prominent non-communicable diseases like Diabetes, Kidney diseases and Ischemic heart diseases, since major behavioral and lifestyle risk factors identified are also implicated in them. <sup>(18)</sup>

There are some implications for nursing practice. Findings of this study revealed that Nigerian workers lack adequate information on stroke risk factors. Also poor practice of stroke prevention was identified. Hence, there is need for nurses to modify the health information usually given to clients attending various outpatient clinics in Nigeria to include stroke awareness and prevention in their daily talks since major lifestyle risk factors are also implicated in the cause of other non-communicable disease like diabetes and hypertension. Also nurses should encourage

individuals to practice healthy dietary intake, avoid the intake of alcohol and cigarette smoking and also participate in range of motion exercises. Additionally symptoms suggestive of hypertension and stroke should be promptly reported to the hospital for proper management. This would bring about behavioral and lifestyle modification and ultimately reduce the burden of stroke in Nigeria.

## **CONCLUSION**

This study revealed that the awareness of stroke risk factors is inadequate. Also there is poor practice of stroke prevention. This implies the need for intensified programs on awareness campaigns and public education of stroke, its risk factors and various preventive health practices of stroke in order to reduce the burden of stroke in Nigeria. The use of mass media especially television is recommended for use in such campaigns. In addition, government and legislature should formulate health policies which will mandate all organizations whether government owned or private to ensure that every worker irrespective of their age goes for quarterly routine medical check-up. This will ensure prompt and early diagnosis of stroke and its further prevention. In the future, more studies should be carried out on strokes prevention in other parts of Nigeria. Also barriers to effective treatment and management of stroke should be investigated.

## **ACKNOWLEDGEMENT**

We would like to thank those who participated in this study and the organization for their support.

## **REFERENCES**

1. WHO MONICA Project Investigators. The world health organization MONICA project (Monitoring trends and determinants in cardiovascular disease). Vol. 41, Journal of Clinical Epidemiology. 1988. p. 105–14.
2. World Health Organization. The Global Burden of Disease: 2004 update



- [Internet]. 2004 Update. 2008. p. 146. Available from: [http://www.who.int/healthinfo/global\\_burden\\_disease/2004\\_report\\_update/en/index.html](http://www.who.int/healthinfo/global_burden_disease/2004_report_update/en/index.html)
3. Adeloye D. An estimate of the incidence and prevalence of stroke in Africa: A systematic review and meta-analysis. Vol. 9, PLoS ONE. 2014.
  4. Feigin VL, Norrving B, George MG, Foltz JL, Roth G a, Mensah G a. Prevention of stroke: a strategic global imperative. *Nat Rev Neurol* [Internet]. 2016;12(9):501–12. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/27448185>
  5. Murray CJL, Lopez AD. Measuring the Global Burden of Disease. *N Engl J Med* [Internet]. 2013;369(5):448–57. Available from: <http://www.nejm.org/doi/abs/10.1056/NEJMra1201534>
  6. Feigin VL, Krishnamurthi R V., Parmar P, Norrving B, Mensah GA, Bennett DA, et al. Update on the Global Burden of Ischemic and Hemorrhagic Stroke in 1990-2013: The GBD 2013 Study. *Neuroepidemiology*. 2015;45(3):161–76.
  7. Roth GA, Forouzanfar MH, Moran AE, Barber R, Nguyen G, Feigin VL, et al. Demographic and Epidemiologic Drivers of Global Cardiovascular Mortality. *N Engl J Med* [Internet]. 2015;372(14):1333–41. Available from: <http://www.nejm.org/doi/abs/10.1056/NEJMoa1406656>
  8. Maher D, Waswa L, Baisley K, Karabarinde A, Unwin N, Grosskurth H. Distribution of hyperglycaemia and related cardiovascular disease risk factors in low-income countries: A cross-sectional population-based survey in rural Uganda. *Int J Epidemiol*. 2011;40(1):160–71.
  9. Kumara WA, Perera T, Dissanayake M, Ranasinghe P, Constantine GR. Prevalence and risk factors for resistant hypertension among hypertensive patients from a developing country. *BMC Res Notes* [Internet]. 2013;6:373. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/24053215>
  10. Ibrahim MM, Damasceno A, WHO, WHO, Anselmi M, Avanzini F, et al. Hypertension in developing countries. *Lancet* (London, England) [Internet]. 2012;380(9841):611–9. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/22883510>
  11. Owolabi MO, Akarolo-Anthony S, Akinyemi R, Arnett D, Gebregziabher M, Jenkins C, et al. The burden of stroke in Africa: a glance at the present and a glimpse into the future. *Cardiovasc J Afr* [Internet]. 2015;26(2 Suppl 1):S27-38. Available from: <http://www.scopus.com/inward/record.url?eid=2-s2.0-84930038869&partnerID=tZOtx3y1>
  12. Akinyemi RO, Ogah OS, Ogundipe RF, Oyesola OA, Oyadoke AA, Ogunlana MO, et al. Knowledge and perception of stroke amongst hospital workers in an African community. *Eur J Neurol*. 2009;16(9):998–1003.
  13. Ayanniyi O, Akande O, Mustapha AF. Knowledge and perception of stroke among adults in Osogbo, Nigeria. *Afr J Med Med Sci* [Internet]. 2006;35(4):447–52. Available from: <http://www.embase.com/search/result>
  14. Wabila M, Nyandaiti Y, Balarabe S, Gezawa I, Sulaiman M, Bwala S. Risk factor profile among black stroke patients in Northeastern Nigeria. *J Neurosci Behav Heal* [Internet]. 2012;4(5):50–8. Available from: <http://www.academicjournals.org/JNBH>
  15. Ettehad D, Emdin CA, Kiran A, Anderson SG, Callender T, Emberson J, et al. Blood pressure lowering for prevention of cardiovascular disease and death: A systematic review and meta-analysis. *Lancet* [Internet]. 2015;387(10022):957–67. Available from: [http://dx.doi.org/10.1016/S0140-6736\(15\)01225-8](http://dx.doi.org/10.1016/S0140-6736(15)01225-8)
  16. Spring B, Ockene JK, Gidding SS, Mozaffarian D, Moore S, Rosal MC, et al. Better population health through behavior change in adults: A call to action. *Circulation*. 2013;128(19):2169–76.
  17. Yan LL, Li C, Chen J, Miranda JJ, Luo R, Bettger J, et al. Prevention, management, and rehabilitation of stroke in low- and middle-income

- countries. Vol. 2, eNeurologicalSci. 2016. p. 21–30.
18. Norrving B, Davis SM, Feigin VL, Mensah GA, Sacco RL, Varghese C. Stroke Prevention Worldwide - What Could Make It Work? *Neuroepidemiology* [Internet]. 2015;45(3):215–20. Available from: <http://www.ncbi.nlm.nih.gov/pubmed/26505459>

How to cite this article: Ogechi AC, Bolajoko AO. Awareness of stroke risk factors and preventive health practices among federal civil servants in Ogun state, Nigeria. *Int J Health Sci Res.* 2017; 7(7):202-211.

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