

## Nexus between Socio-demographic Characteristics and Risk of Hypertension among Older Adults in Selected Southwest Nigeria

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**ABSTRACT:** Non-communicable diseases (NCDs) such as hypertension, diabetes mellitus and cardiovascular diseases among others remain the highest burden of mortality globally. The diseases are largely caused by four modifiable risk factors such as tobacco consumption, alcohol intake, physical inactivity and poor dietary. This study aimed to examine the relationship between socio-demographic characteristics and the risk of hypertension among older adults in selected Southwest Nigeria. A total number of 1,296 respondents were selected across three Southwest Nigeria such as Lagos, Ogun and Oyo States using a multi-stage sampling technique. Data was analyzed using a Multinomial Logistic Regression (MLR). Socio-demographic characteristics such as age, education and state of residence remain the factors significantly related to the risk of hypertension among older adults in Southwest Nigeria. The study recommended that the government at both federal, state and local should improve on the policy and program interventions that will increase awareness of risk factors for NCDs so as to reduce the burden of NCDs in Nigeria.

**KEY WORDS:** *Socio-demographic Characteristics, Hypertension, Older Adults*

### I. INTRODUCTION

#### Background

Hypertension also known as High Blood Pressure (HBP) is a major global health concern due to its high prevalence and association with increased risk of cardiovascular diseases (WHO, 2005). Hypertension is the predominant cause of mortality and morbidity in sub-Saharan Africa, Nigeria inclusive (Cappuccio *et al.*, 2004; Olatunbosun, Kaufman, Cooper, & Bella, 2000; Rodgers & Vaughan, 2002). Socio-demographic characteristics such as age, sex, education, marital status, religion and family history have been identified as some of the factors influencing the high prevalence of hypertension in Nigeria (Abdulsalam, Olugbenga-Bello, Olarewaju, & Abdus-Salam, 2014; Adeoye *et al.*, 2016; Tagurum *et al.*, 2015). Because of the aging process, older adults seem to be more vulnerable to the risk of hypertension than the young population. There is a dearth of study on the influence of socio-demographic characteristics on the risk of hypertension at the community level in South-Western Nigeria. To this end, this study examined the relationship between socio-demographic characteristics and the risk of Hypertension among older adults in Southwestern Nigeria.

### II. METHODOLOGY

The study employed a cross-sectional research design. The survey was carried out in selected Southwestern Nigeria (Lagos, Ogun and Oyo States). The target population for this study is the older adults who were 60 years and above as at the time of the survey. One thousand two hundred and ninety-six respondents were selected in the community using a multi-stage sampling method. In the first stage, the researcher purposively selected three states (Lagos, Ogun, and Oyo) out of the six South-Western states. The criterion used was based on the top three states with the highest number of older adults. The second stage also involved a purposive selection of one Local Government Area (LGA) from each state that has the highest number of older adults. In Lagos, Alimosho LGA was selected while in Ogun and Oyo, Ado Odo/Ota and Ibadan Northeast LGA were selected respectively. The third stage involved a random selection of two communities from each of the selected LGA. The fourth stage involved the selection of household at the community level using systematic sampling. Approval was sought for from Health Research and Ethical Committee (HREC) of the Obafemi Awolowo University, Ile-Ife,

Nigeria. In addition, the respondents were informed prior to the study and were all willing to participate in the study. The researcher assured the respondents that the information gathered would not be shared with a third party.

### Measurement of Dependent Variable

#### Blood Pressure Reading (Systolic) and Blood Pressure Reading (Diastolic):

Sphygmomanometer was used to take the blood pressure readings to the respondents at least twice to ensure accuracy. Blood pressure readings (systolic/diastolic) were collapsed into four categories as 1 "normal blood pressure (below 120/ 80mm Hg)", 2 "pre-hypertension stage (120-139/80-89 mm Hg)", 3 "stage 1 hypertension (140-159/90-99 mm Hg)" and 4 "stage 2 hypertension (160/100 mm Hg or higher)".

## III. RESULTS

### Socio-demographic Characteristics of the Older Adults

The participants are described in terms of their socio-demographic characteristics such as sex, age, educational level, ethnicity, marital status, occupation, religion and average household earning as shown in Table 1a. The older adults comprised 40% male and 60% female participants. The participants' age was distributed with a mean of 65.8 and standard deviation being 5.6 that shows that the age data is normally distributed and devoid of extreme scores. In addition, the participants' ages were grouped into three as younger-old (60-69 years), older-old (70-79 years) and oldest-old (80 years and above).

The analysis showed that more than three-quarter (79%) of the participants were younger olds, while 18% were older olds and less than one-tenth (3%) were the oldest olds. With reference to the level of education, 14% of the participants had no formal education, 38% had primary education, 39% had secondary education and 10% had post-secondary education. The distribution by ethnicity indicates that among the participants, 86% were of the Yoruba ethnic group, followed by 12% participants who belong to the Igbo ethnic group and the least were Hausa and others (0.31% and 1% respectively). Marital status of the participants showed that 68% were currently married, 9% were separated, 2% were divorced, 20% were widowed and others comprised of 1%.

Distribution of participants' work status revealed that 7% was the government employee, 5% were the non-government employee, 59% were self-employed, 2% were non-paid workers, 14% were retirees, 5% were unemployed and 7% were engaged in other occupation. The data perhaps revealed that the vast majority of the participants were economically active in their old age, meanwhile, the most reported occupation was self-employment. In terms of religion, 69% of the participants belong to Christianity, 31% belong to Islam and less than one-tenth belong to traditional religion. The average household earning was distributed such that 35% of the participants had the lowest household earning, while those who had the medium and highest household earnings both were 33% respectively (Table 1b).

**Table 1a: Distribution of Older Adults' by Socio-Demographic Characteristics**

Characteristics	Lagos N = 438 (%)	Oyo N = 422 (%)	Ogun N = 436 (%)	Total N = 1,296 (%)
Sex				
Male	210 (47.95)	166 (39.34)	146 (33.49)	522 (40.28)
Female	228 (52.05)	256 (60.66)	290 (66.51)	774 (59.72)
Age				
Younger old (60-69)	332 (75.80)	335 (79.38)	361 (82.80)	1,028 (79.32)
Older old (70-79)	94 (21.46)	76 (18.01)	61 (13.99)	231 (17.82)
Oldest old (80+)	12 (2.74)	11 (2.61)	14 (3.21)	37 (2.85)
Mean and SD	66.08; 5.95	66.03; 5.06	65.22; 5.72	65.8; 5.6
Level of education				
No formal education	50 (11.42)	71 (16.82)	58 (13.30)	179 (13.81)
Primary	117 (26.71)	238 (56.40)	138 (31.65)	493 (38.04)
Secondary	214 (48.86)	110 (26.07)	176 (40.37)	500 (38.58)
Post-secondary	57 (13.01)	3 (0.71)	64 (14.68)	124 (9.57)

**Table 1b: Distribution of Older Adults' by Socio-Demographic Characteristics**

Characteristics	Lagos N = 438 (%)	Oyo N = 422 (%)	Ogun N = 436 (%)	Total N = 1,296 (%)
<b>Ethnicity</b>				
Yoruba	307 (70.09)	406 (96.21)	406 (93.12)	1, 119 (86.34)
Igbo	121 (27.63)	16 (3.79)	23 (5.28)	160 (12.35)
Hausa	4 (0.91)	0 (0.00)	0 (0.00)	4 (0.31)
Others	6 (1.37)	0 (0.00)	7 (1.61)	13 (1.0)
<b>Marital status</b>				
Currently married	359 (81.96)	176 (41.71)	345 (79.13)	880 (67.9)
Separated	42 (9.59)	41 (9.72)	32 (7.34)	115 (8.87)
Divorced	3 (0.68)	27 (6.40)	2 (0.46)	32 (2.47)
Widowed	33 (7.53)	171 (40.52)	51 (11.70)	255 (19.68)
Others	1 (0.23)	7 (1.66)	6 (1.38)	14 (1.08)
<b>Occupation</b>				
Government employee	67 (15.30)	4 (0.95)	24 (5.50)	95 (7.33)
Non-government employee	16 (3.65)	7 (1.66)	38 (8.72)	61 (4.71)
Self-employed	271 (61.87)	215 (50.95)	278 (63.76)	764 (58.95)
Non-paid	4 (0.91)	17 (4.03)	5 (1.15)	26 (2.01)
Retired	40 (9.13)	75 (17.77)	67 (15.37)	182 (14.04)
Unemployed	37 (8.45)	18 (4.27)	16 (3.67)	71 (5.48)
Others	3 (0.68)	86 (20.38)	8 (1.83)	97 (7.48)
<b>Religion</b>				
Christianity	328 (74.89)	253 (59.95)	315 (72.25)	896 (69.14)
Islam	109 (24.89)	168 (39.81)	121 (27.75)	398 (30.71)
Traditional	1 (0.23)	1 (0.24)	0 (0.00)	2 (0.15)
<b>Average household earning (per month)</b>				
Lowest	138 (31.51)	268 (63.51)	43 (9.86)	449 (34.65)
Medium	67 (15.30)	151 (35.78)	207 (47.48)	425 (32.79)
Highest	233 (53.20)	3 (0.71)	186 (42.66)	422 (32.56)

### **Multinomial Logistic Regression of Socio-demographic Characteristics on the Risk of Hypertension among Older Adults**

The relative risk ratios (RRR) from multinomial logistic regression model for the risk of hypertension are presented in Table 2. The model is an adjusted model that describes the regression of socio-demographic factors on the risk of hypertension. The results showed that age, level of education and state of residence predicted significant changes in the risk of hypertension among older adults. In terms of age, the results showed that relative risk of stage 2 hypertension was twice greater among the older old (70-79) participants compared with younger old (60-69) participants (95% CI: 1.14-3.75;  $p < 0.05$ ). By the level of education, the results showed that the relatively low risk of hypertension decreased by 53% among participants who had primary education compared to those who had no formal education (95% CI: 0.23-0.96;  $p < 0.05$ ). Analysis based on state of residence showed that the relative no risk of hypertension increased by 5 times (95% CI: 2.80-9.71;  $p < 0.001$ ), the relative low risk of hypertension increased by 5 times (95% CI: 0.33-1.04;  $p < 0.001$ ) and the relative low risk of hypertension increased by 26 times (95% CI: 13.31-50.87;  $p < 0.001$ ) among participants in Ogun state when compared with participants in Lagos state.

This study corroborates with the studies of researchers such as Daniel, Adejumo, Adejumo, Owolabi, and Braimoh (2013) who submitted that age, sex, education, religion, Body Mass Index and marital status were

significantly associated with hypertension. In addition, Ogahet *al.* (2013), Aliyuet *al.* (2015) and Tagurumet *al.* (2015) in their study also concurred that age is a major determinant of hypertension.

**Table 2: Multinomial Logistic Regression Showing the Effect of Socio-demographic Characteristics on the Risk of Hypertension with 'normal blood pressure' as the base outcome**

Characteristics	Pre-hypertension		Stage 1 Hypertension		Stage 2 Hypertension	
	RRR	95% CI	RRR	95% CI	RRR	95% CI
Sex						
Male	1		1		1	
Female	0.98	0.69-1.40	0.91	0.62-1.32	0.73	0.48-1.10
Age						
younger old (60-69)	1		1		1	
older old (70-79)	1.54	0.91-2.62	1.64	0.94-2.87	2.06	1.14-3.75*
oldest old (80+)	1.56	0.46-5.25	1.65	0.46-5.88	1.19	0.30-4.81
Level of education						
no formal education	1		1		1	
Primary	0.98	0.51-1.88	0.45	0.23-0.89*	0.47	0.23-0.96*
Secondary	0.99	0.50-1.95	0.51	0.25-1.01	0.71	0.34-1.49
post-secondary	0.76	0.32-1.81	0.46	0.19-1.10	0.42	0.16-1.10
Marital status						
currently married	1		1		1	
Separated	0.6	0.33-1.07	0.77	0.41-1.43	0.66	0.33-1.32
Divorced	0.56	0.24-1.31	0.58	0.20-1.69	0.00	0
Widowed	0.9	0.53-1.53	0.77	0.42-1.42	0.78	0.41-1.47
Others	0.29	0.06-1.41	0.59	0.12-2.98	0.16	0.02-1.32
Occupation						
Government employee	1		1		1	
Non-government employee	0.37	0.12-1.17	0.31	0.09-1.04	0.39	0.11-1.143
Self-employed	0.54	0.23-1.27	0.51	0.22-1.21	0.69	0.26-1.81
Non-paid	0.9	0.22-3.75	0.53	0.10-2.80	1.13	0.20-6.48
Retired	0.47	0.17-1.26	0.57	0.21-1.56	0.95	0.32-2.88
Unemployed	0.6	0.19-1.90	0.74	0.22-2.45	1.64	0.45-6.02
Others	0.68	0.22-2.09	0.71	0.21-2.36	1.19	0.32-4.44
Average household earning (per month)						
Lowest	1		1		1	
Medium	1.38	0.87-2.18	1.73	1.04-2.90	1.51	0.86-2.64
Highest	0.89	0.52-1.51	1.16	0.66-2.05	1.03	0.55-1.96
State						
Lagos	1		1		1	
Oyo	1.13	0.68-1.89	0.59	0.33-1.04	1.19	0.63-2.25
Ogun	5.21	2.80-9.71***	5.01	2.65-9.47***	26.02	13.31-50.87***

\*p-value < 0.05; \*\*p-value < 0.01; \*\*\*p-value < 0.001

#### IV. CONCLUSION

The study concludes that socio-demographic factors such as age, education background and State of residence remain the factors influencing the risk of hypertension in Southwestern Nigeria. Furthermore, the occurrences of hypertension showed remarkable differences across the selected states. Lagos and Ogun states are hotspots with a greater prevalence of hypertension.

#### V. RECOMMENDATION

The study recommends that government should improve more on the policy and programmes that will increase the level of awareness of risk factors for non-communicable diseases among the older adults in the community.

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