Analysis of Workplace Characteristics and Blood Pressure Status among Civil Servants in Rural and Urban Communities of Niger State, Nigeria

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Abstract:

Background: The global burden estimate of hypertension is alarming, resulting into several millions of deaths per year. High incidences of sudden deaths among civil workforce in Nigeria are often reported. Analysis of the association between workplace characteristics and blood pressure status among civil workforce in Nigeria has not been understood. **Objectives:** This study aims to establish the independent relationship of workplace characteristics, with blood pressure of civil servants in rural and urban communities of Niger State **Methods:** Regression analysis was used to estimate the coefficients of all the variables involved to establish their effects on SBP and DBP. **Conclusions:** **A**ge, gender, government tier workplace, and ministries, departments and agencies (MDAs) of participants significantly affect the SBP and DBP. The findings among this subset of civil workforce are quite important to the need of undertaking a large scale assessment of the effects of variables considered in this study on blood pressure across the civil workforce in Niger state and in Nigeria.

Keywords: Workplace characteristics; Civil Servants; Hypertension; Systolic; Diastolic; Niger State

Introduction

Non-Communicable Diseases (NCDs) have become in the recent times major globalized health risks (Maiyaki & Garbati, 2014), especially hypertension (HBP) (Awosan, et al, 2014) with the burden becoming more in the developing countries than in the developed countries (Young et al, 2009). The global burden estimate of hypertension is well over 1 billion people resulting into about 7.1 million deaths per year (Angaw et al, 2015; Kirubel & Mojgan, 2015). The danger is that is increasingly becoming under-diagnosed, inadequately treated and controlled especially in most urban cities of sub-Saharan Africa (sSA) (Dalal et al., 2011). In Nigeria, increase in prevalence of HBP of more than 48% of adult population (Akinlua, et al, 2015) is alarmingly a burden to public health issues in Africa in view of her undoubtedly the most populous country in the region with well over 180 million people. With rising epidemiological, demographic and lifestyle changes, the expectation is in continuous increase (Akinlua et al., 2015; Perkovic et al, 2007).

Materials and Methods

The survey was conducted as a community-based cross sectional descriptive survey. Eligible civil servants were interviewed using interview administered questionnaire. The reliability of this instrument was confirmed with test re-test method which resulted into correlation coefficient of 0.92. The two local government areas in focus were purposely selected such that Bida Local Government area was considered as urban area, while Wushishi Local Government Area was considered as a rural area. A starting MDA (Government Ministry, Department and Agency) was determined at random and all eligible civil servants who consented to the survey were interviewed and data collected. In situations where we were unable to find the total number needed for the survey in any MDA, the nearest MDA was visited until the required respondents were found. The survey was conducted over a period of 6 weeks (from 3rd July to 14th August, 2018).

Variables of Interest

The outcome variable was the Resting Pressure Status of participants measured on a continuous scale (both Systolic and Diastolic measures were recorded). The independent variables considered were: Government tier place of work and MDA (Ministries, Department and Agencies) place of work.

Statistical Analysis

Descriptive statistics and percentage frequency were used to describe the variables in this study. Regression analysis was used to describe the relationship between the outcome variable (on continuous scale) and predictor variable (on categorical scale) Stata (2014) was used for computations

Results

The mean age of participants in the combined sample was 41±9.5 years; rural and urban were 40.7±9.3 years and 41±9.8 years respectively. The overall prevalence rate of overweight/obesity was 270 kg/m^2 representing 57.08%, and higher in urban area with 61% than in the rural.

Table 1: Descriptive and Percentage frequency Statistics of Characteristics of Participants

Variables	Combined (n=476)	Rural (n=188)	Urban(n=288)
	Mean	Mean	Mean
Age (years)	41	40.7	41
BMI (Kg/m^2)	57.05	51.6	61
Hypertension	44%	46.7%	41.8%
Weight (Kg)	74.3	75.1	73.9
Height (mm)	166	167.1	165.3

SBP (mmHg)	134.6	136.6	133.3
DBP (mmHg)	84.8	86.3	83.8
Body Fat	38.4	29.8	30.8
Pulse rate (bpm)	77.6	76.8	77.9
	N (%)	**N (%)**	**N (%)**
Tier Work Place			
Federal	148(31.09)	40(21.28)	108(37.89)
State & Local Govt.	328(68.91)	148(78.72)	177(62.11)
Age of Respondents			
15 – 24 years	16(3.40)	8(4.26)	8(2.86)
25 – 34 years	109(23.14)	39(20.74)	69(24.64)
35 – 44 years	159(33.76)	69(36.70)	89(31.79)
45 – 54 years	151(32.06)	62(32.98)	88(31.43)
55 years +	36(7.64)	10(5.32)	25(9.29)
MDA Workplace			
Education	291(62.85)	124(67.03)	164(59.64)
Health	75(16.20)	36(19.46)	39(14.18)
Finance	16(3.46)	4(2.16)	12(4.36)
Agriculture	37(7.99)	7(3.78)	30(10.91)
Rural Development	18(3.89)	9(4.86)	9(3.27)
Others	26(5.62)	5(2.70)	21(7.64)
Education Status			
No Education	24(5.38)	14(7.78)	10(3.80)
Education	422(94.62)	166(92.22)	253(96.20)
Gender			
Male	311(65.47)	136(72.34)	173(60.92)
Female	164(34.53)	52(27.66)	111(39.08)

About 44% of the entire participants would be classified as hypertensive, while rural participants (46.7%) were more hypertensive than the urban participants (41.8%). 16.9% of urban participants and 10.7% of rural participants were not married.

Table 2: Relationship between Workplace Variables and Blood Pressure

Variables	**Combined (n=476)**		**Rural (n=188)**		**Urban(n=288)**	
	Systolic BP	**Diastolic BP**	**Systolic BP**	**Diastolic BP**	**Systolic BP**	**Diastolic BP**
	Coeff. (p-val)	**Coeff. (p-val)**	**Coeff. (p-val)**	**Coeff. (p-val)**	**Coeff. (p-val)**	**Coeff. (p-val)**
Tier Work Place						
Federal	Reference		Reference		Reference	
State & Local Govt.	6.98 (0.002*	2.84 (0.036)**	8.536 (0.037)**	4.549 (0.084)***	5.78 (0.037)**	1.51 (0.343)
Age of Respondents						
15 – 24 years	Reference		Reference		Reference	
25 – 34 years	4.83 (0.41)	5.89 (0.96)***	3.355 (0.683)	8.322 (0.127)	6.16 (0.459)	3.70 (0.432)
35 – 44 years	8.48 (0.14)	7.57 (0.02)**	9.588 (0.226)	11.330 (0.03)**	7.82 (0.341)	4.25 (0.362)
45 – 54 years	14.97 (0.01)**	12.0 (0.00)*	19.847 (0.013)**	17.133 (0.001)*	11.22 (0.173)	7.65 (0.102)
55 years +	29.63(0.00)*	17.3 (0.00)*	38.35 (0.000)*	21.575 (0.001)*	26.39 (0.004)*	14.36 (0.005)*
MDA Workplace						
Education	Reference		Reference		Reference	
Health	-11.02 (0.00)*	-6.81 (0.00)*	-11.098 (0.010)*	-5.731 (0.038)**	11.36 (0.006)*	-8.00 (0.001)*
Finance	4.76 (0.41)	0.37 (0.91)	-17.323 (0.129)	9.825 (0.178)	1.12 (0.87)	-2.39 (0.54)
Agriculture	-7.75 (0.05)**	-5.27 (0.02)**	-16.355 (0.061)***	-9.674 (0.083)***	-5.03 (0.27)	-3.74 (0.15)
Rural Development	-3.46 (0.53)	-1.46 (0.65)	1.963 (0.799)	-0.119 (0.981)	-9.46 (0.23)	-3.14 (0.48)

Others	-5.09 (0.28) -3.45 (0.21)	3.273 (0.748) -1.271 (0.845)	-6.36 (0.23) -3.47 (0.25)
Gender			
Male	Reference	Reference	Reference
Female	-4.89 (0.02)** -2.97 (0.02)**	-5.795 (0.121) -5.086 (0.034)**	1.60 (0.313) 4.49 (0.106)

*p<0.01, **p<0.05, ***p<0.10

In table 2, the estimated total effect (TE) among civil servants in the combine data set revealed that being a state/local government civil servant has a 6.98 mm Hg (p<0.002) and 2.84 mm Hg (p<0.036) increase in both SBP and DBP respectively above being a federal staff. Staff in health sector has 11 mm Hg drop in SBP and 6.8 mm Hg drop in DBP, while being a staff in Agricultural sector has 7.8 mm Hg drop in SBP and 5.27 mm Hg drop in DBP than the average measure of those participants in education sector. Being educated has 3.98 mm Hg drop in SBP and 0.15 drop in DBP compare with staff not educated, though not significant. Working as state/local government staff and protective being a female and working outside education status.

Discussion

In this study, high prevalence of hypertension (44%) was found among civil workforce in rural and urban communities of Niger state, Nigeria. This relatively high prevalence of HBP agrees with results in similarly studies reported in (Akinlua et al., 2015; Daniel & Pedro, 2013; Pessinaba et al., 2013), but varied with other findings reported in (Angaw et al., 2015; Oghagbon et al, 2008). These variations may be attributed to the differences in the population of studies. Increased age were also identified in this study as harmful effects of both SBP and DBP where participants above the age of 34 years were more likely to be hypertensive than those below the age of 25 years and this agrees with several other studies (Cois & Ehrlich, 2014; Oghagbon et al., 2008). The result also revealed that females generally have more protective effect of SBP and DBP than male counterparts. This agreed with other studies that found that men have higher blood pressure than women of the same age group (Akinlua et al., 2015; Bello, 2013; Haijar et al, 2006).

The Ministries, Departments and Agencies (MDAs) where the participants work in were statistically significantly associated with SBP and DBP. Those who work in Health and Agricultural sectors were found to be of protective effects become hypertensive than those who work in education sector. However, non-payment of workers' salary is more common among Staff in education sector especially in states and local governments in Nigeria(Aluko, 2018; Published, 2018).

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