

The Prevalence and Determinants of Overweight, Obesity, and Hypertension in a Bank in Birnin Kebbi, Kebbi State, North-West Nigeria

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Abstract

Cardiovascular disease is the leading cause of death globally. Overweight, obesity, and hypertension are the top modifiable risk factors for cardiovascular diseases. Sedentary lifestyle, unhealthy eating, and stress in the banking industry predispose employees to overweight, obesity, and hypertension.

The study was a cross-sectional survey of 52 employees of a bank in Birnin Kebbi, North-East Nigeria that participated in a healthy lifestyle program. The aim of the study was to determine the prevalence and determinants of overweight, obesity, and hypertension in bank employees. The data was collected using an interview schedule, anthropometric and blood pressure measurements and analyzed with statistical package for social sciences.

The participants aged 26 to 59 years, 65.4% were youth, 34.6% middle-aged, 94.2% men, and 5.8% women. Senior staffs constituted 53.8%, junior 38.5%, and executive 7.7%. The mean weight was 77.99 ± 12.4kg, height 1.72 ± 0.07m, Body Mass Index 26.38 ± 3.93Kg/m², systolic blood pressure 122 ± 21mmHg, and diastolic blood pressure 76 ± 14mmHg. The prevalence of overweight was 50%, obesity 15.4%, and hypertension 28.8%. Gender was significantly associated with overweight (p .037). The relationship between obesity and hypertension was not statistically significant (p 0.056).

Lifestyle modification in form of regular exercise and healthy eating would reduce overweight, obesity, and hypertension as well as cardiovascular morbidity and mortality in the banking industry. There is the need to establish workplace gymnasium and to increase public health awareness on healthy eating and regular exercise.

Keyword: Prevalence, Determinants, Overweight, Obesity, Hypertension, Bank.

Introduction

Non communicable diseases, particularly cardiovascular disease, are prevalent in the banking industry. This study explored the prevalence and determinants of overweight, obesity, and hypertension in bank employees in Birnin Kebbi, North-West Nigeria. The banking industry is characterized by risk factors that predispose to overweight, obesity, and hypertension such as high income, unhealthy eating, sedentary lifestyle, long working hours, and stress necessitating the need for the study.

Obesity is a recognized clinical entity and implies an excessive accumulation of body fat causing an increase in body weight. Visceral obesity constitutes a significant risk factor for cardiovascular disease. Obesity is caused by the interaction of genetic factors with environmental factors of excessive eating of unhealthy foods and reduced physical activity. Sedentary lifestyle is the leading cause of obesity in this era of technological advancement.

Globally, the most acceptable definition of obesity is based on body mass index (BMI) (WHO, 2019a). BMI is calculated as weight (in Kg) divided by height squared (in meters). It is used to classify body weight as underweight, healthy weight, overweight, and obesity (Table 1) with obesity grouped into obesity type 1, type 2, and type 3 (morbid obesity).

According to WHO (2019b), Hypertension is a sustained increase in blood pressure (BP) above 140/90 irrespective of age and sex. Hypertension can be mild, moderate, or severe; systolic or diastolic; and primary (idiopathic) or secondary. In primary hypertension, the cause is not known but it is associated with family history, high salt intake, obesity, stress, and sedentary lifestyle. Secondary causes of hypertension include kidney diseases, endocrine disorders, pregnancy-induced, drugs, raised intracranial pressure, and vascular abnormalities.

Globally, over 1.9 billion people are overweight with 13% (650 million) obese (WHO, 2019a). Overweight and obesity are most prevalent in North America and least common in Asia. Obesity-related diseases cause over 2.8 million people death annually (WHO, 2019a). Hypertension is the leading risk factor of cardiovascular disease, and causes over 7.5 million deaths annually with Africa having the highest prevalence (46%) and Americas the lowest - 35% (WHO, 2019b).

The risk factors of overweight, obesity, and hypertension appear to similar. These include increasing age, family history, sedentary lifestyle, high socioeconomic status, (WHO, 2019a). Overweight and obesity are also risk factors for hypertension (WHO, 2019b).

Methods

This study was conducted at a bank in Birnin Kebbi, Kebbi state, North-West Nigeria in 2016 during a healthy lifestyle program to explore the prevalence and determinants of overweight, obesity, and hypertension. It adopted a cross-sectional approach using convenience non-probability sampling technique. A total of 52 bank employees that participated in the program gave informed consent and were included in the study.

The data was collected by trained medical personnel through interview schedule and anthropometric and blood pressure (BP) measurement using questionnaire, measuring tape, weighing scale, standiometer, calculator, Excel template, and electronic sphygmomanometers. Personal data was limited to age, sex, and office status (a measure of personal and family income) while biometrics included weight, height, BMI, waist circumference (WC), hip circumference (HC), waist-hip-ratio (WHR), and BP.

The Excel dataset was exported to SPSS. The names and identity numbers of the participants were deleted. The age was grouped into youth (18-39 years old) and middle age (40-64 years old). Qualitative data was coded into numeric values to aid analysis. BMI, WHR, and BP were also transformed and grouped as ordinal variables based on the WHO criteria. The only nominal variable was gender. The ordinal variables included age groups, office status, BMI groups, WHR groups, and BP groups. The office status included junior, senior, and executive. The BP was grouped into normal (<140/90) and hypertension (>140/90). The BMI groups were healthy weight (18.5-24.9kg/m²), overweight (25-29.9kg/m²), and obesity (>30kg/m²). The WHR groups were normal (<0.85 in women and < 0.9 in men) and abnormal (>0.85 in women and >0.9 in men).

The independent or predictor variables were age, age group, gender, office status, weight, height, BMI, BMI groups, WC, HC, WHR, and WHR groups while the dependent variables were systolic and diastolic BP, overweight, obesity, and hypertension. The analysis involved univariate statistics, cross-tabulation and X² test, and correlation. A Confidence level (CL) of 95% and a level of significance of 0.05 were used for the analysis. When p-value was < 0.05, the null hypothesis (H₀) was rejected meaning the observed association was statistically significant.

The greatest weakness of the study was the small sample size (52) and the use of a non-probability sampling technique. Therefore, the statistical power of the study was low and generalization of findings guarded. However, the findings of this study could open up the need for more research in this direction.

Results

The socio-demographic profile of the staff is summarized in Tables 2 and 3. The ages range ranged from 26 to 59 years with a mean of 38.44 ± 9.40 years, and 65.4% were youths and 34.6% were middle-aged with 94.2% men and only 5.8% women. Senior staff were 53.8%, junior 38.5%, and executive 7.7%.

The mean weight, height, BMI, WC, HC, WHR, systolic and diastolic BP of the participants were 77.99 ± 12.4kg, 1.72 ± 0.07m, 26.38 ± 3.93Kg/m², 93.77 ± 8.82cm, 102.12 ± 8.16cm, 0.92 ± 0.08, 122 ± 21mmHg, and 76 ± 14mmHg respectively (Table 3). Weight was bimodal while WC was quadrimodal (Figure 1 and 2).

Based on BMI, 18 staff (34.6%) had normal weight, 26 were overweight (50%), and 8 were obese (15.4%). Similarly, WHR indicated that 17 staff (32.7%) had normal WHR while 35 (67.3%) had abnormal WHR. A total of 37 staff (71.2%) had normal BP while 15 were hypertensive (28.8%).

Therefore, the prevalence of overweight, obesity, abnormal WHR, and hypertension were 50%, 15.4%, 67.3%, and 28.8% respectively (Figure 3).

The statistical associations are shown in Tables 4, 5, 6, 7 and 8. Gender was significantly associated with overweight (LR (1) = 4.343, p .037) with small effect size (Phi = 247). All female participants (100%) were overweight. Age and office status did not show statistically significant relationships with overweight. Age, gender, and status were not significantly associated with obesity or hypertension. Overweight, obesity, and abnormal WHR were not significantly associated with hypertension. BMI was positively associated with WC (r (52) = .688, p .0001) and HC (r (52) = .703, p .0001). There was a weak negative insignificant association between WHR and BP that needs further investigations.

Discussion

In the banking industry across the world, the prevalence of overweight and obesity is higher than in the general population. Sekoni et al. (2013) reported the least prevalence of 40.4% of combined overweight and obesity amongst bank employees in Lagos, Nigeria while Addo et al. (2015) reported 55.6% in Accra, Ghana. Studies in Iran and India showed a higher prevalence of 76.5% - 77.5% (Hirani et al., 2017; Jafari-Shakib et al., 2016; Salaroli et al., 2013). These prevalences are much higher than the national prevalence of overweight (20-35%) and obesity (8-22%) in Nigeria (Chukwuonye et al. 2013).

In this study, the prevalence of overweight was 50%. Young et al. (2018) and Sulaiman et al. (2017) found a comparable prevalence of 47.3% and 43% among blacks in the US and expatriates in the UAE respectively. This high prevalence of overweight may be attributed to the relatively high standard of living enjoyed by bank employees since in Africa obesity is perceived as evidence of good living. It also demonstrates the rate at which isolated populations and communities in developing countries are already in the third stage of demographic transition with a preponderance of non-communicable diseases. The relatively low prevalence of obesity in this study (15.4%) much lower than 32.3% reported by Sulaiman et al. (2017) in UAE might have to do with the availability of gymnasium in the bank under study.

The national prevalence of hypertension in Nigeria is 28%, and this figure will double by 2030 (Adeloye et al., 2015). Globally, the prevalence of hypertension is asserted to be higher among bank employees. Ismail et al. (2013) reported a prevalence of 39.3% in India and Salaudeen et al. (2014) reported 34.4% in Ilorin, South-West Nigeria. In contrast, a lower prevalence was reported in Ethiopia (19.2%) and Owerri South-East Nigeria (12.4%) suggesting possible compounding effect of extraneous factors (Diwe et al. 2015; Fikadu and Lemma, 2016).

The 28.8% prevalence of hypertension in the study tallies with 28.9% national prevalence in Nigeria (Adeloye et al., 2015). The higher prevalence of 34.4% reported by Salaudeen et al. (2014) among bankers in Ilorin Nigeria may suggest the role of environmental factors in hypertension.

The finding of a significant association between gender and overweight where 100% of the women in the study were overweight sharply contrast with the findings of Yang and Colditz (2015) in the US where overweight was commoner in men and obesity was more common in women. A larger study is required to validate these findings.

Conclusion

The objectives of this study have been met to a large extent. The main limitation of the study was the small sample size. However, this study has opened up potential areas for further exploration and research.

The statistically insignificant associations of age, sex, overweight, and obesity with hypertension should not be ignored since the statistical power of this study was low. The sample size should be increased in future studies and sampling method enhanced to permit generalization of findings.

Giving the high prevalence of overweight and hypertension in the banking industry and the relatively low level of utilization of the gymnasias across Nigeria, it is recommended that social and behavioral experts be integrated into the healthy lifestyle interventions to ensure a multidisciplinary approach so that socially and culturally acceptable protocols can be integrated to encourage regular exercise at the gym and a healthy eating habit.

Other banks in Nigeria and Africa should establish workplace gym. This strategy will go a long way in discouraging sedentary lifestyle and curb the menace of overweight, obesity, hypertension, and even diabetes mellitus and the consequent cardiovascular diseases.

Figures and tables

Table 1. Classification of BMI

BMI	
Classification	BMI Score (Kg/m ²)
Underweight	< 18.5
Normal	18.5 – 24.9
Overweight	25.0 – 29.9
Obesity type 1	30.0 – 34.9
Obesity type 2	35.0 – 39.9
Obesity type 3 (morbid obesity)	> 40.0

Table 2. Socio-demographic features of the participants

Demographics					
Age (years)	Mean ± SD	Median	Mode	Minimum	Maximum
	27.37±5.96	26	25	18	45
Age group	Youth (18-39 years)			Middle-age (40-64 years)	
	65.4%			34.6%	
Sex (Gender)	Male			Female	
	94.2%			5.8%	
Office status	Junior		Senior		Executive
	38.5%		53.8%		7.7%

Table 3. Descriptive statistics of biometrics

	Descriptive Statistics of Biometrics					
	Minimum	Maximum	Mode	Median	Mean	Std. Deviation
Weight (Kg)	54.4	116	73*	76.4	77.99	12.46
Height (m)	1.56	1.88	1.75	1.74	1.72	0.07
Body Mass Index	19.16	38.7	30.50	26.15	26.38	3.93
Waist Circumference	75	114	92*	93.5	93.77	8.82
Hip Circumference	83	119	103	102	102.12	8.16
WH Ratio	0.82	1.20	0.95	0.91	0.92	0.08
Systolic BP	84	168	121	119.5	122.42	20.69
Diastolic BP	48	108	80	76.5	75.69	13.67

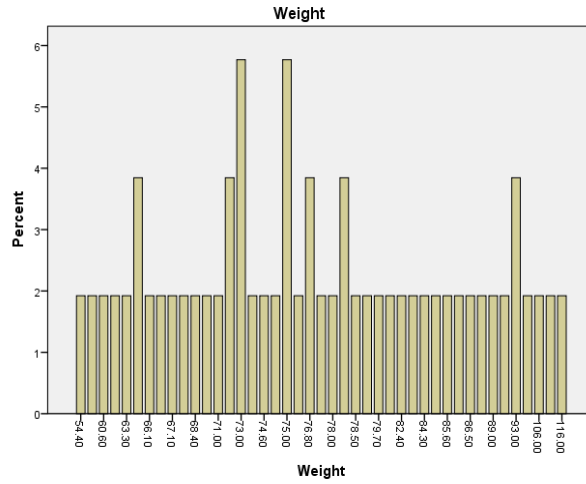


Figure 1. Bar-charts showing weight distribution

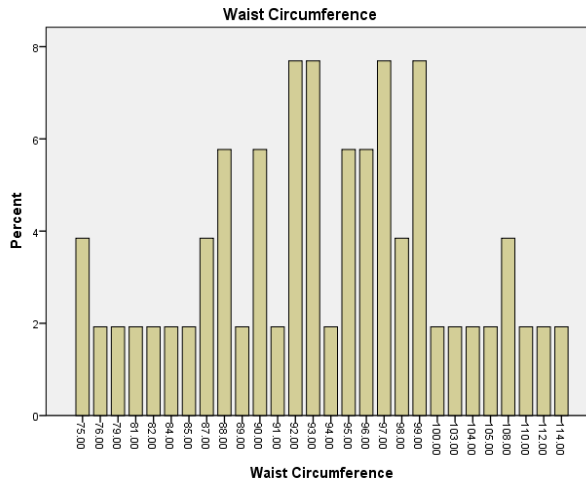


Figure 2. Bar-charts showing WC distribution

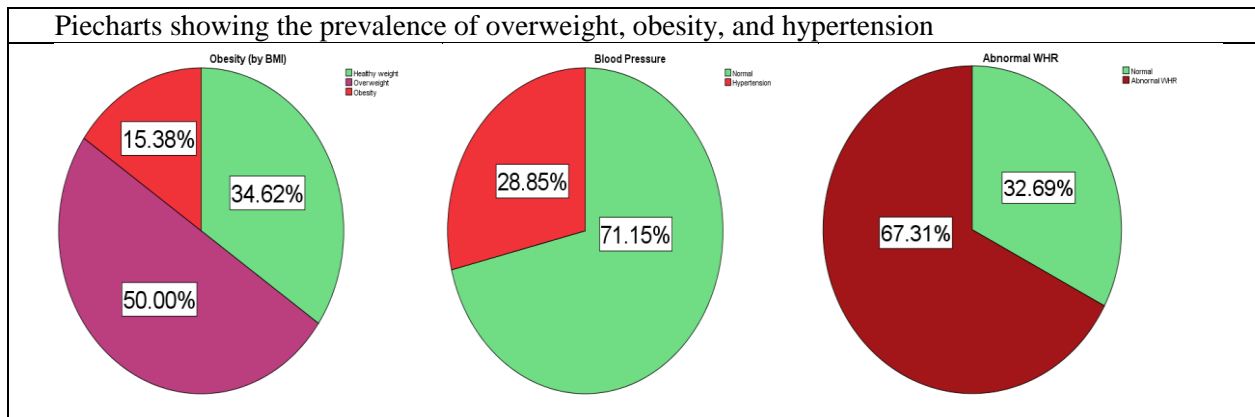


Figure 3. Piecharts showing the prevalence of overweight, obesity, abnormal WHR, and hypertension

Table 4. Predictors of overweight and obesity

Predictors	Outcome	Test	X ² /LR Value	df	P-value	Effect size	SR
Age	Overweight	X ²	0.000	1	1.000	.000 (p = 1.000)	-
Gender	Overweight	LR	4.343	1	.037	.247 (p = .074)	-
Office status	Overweight	LR	1.379	2	.502	.162 (p = .504)	-
Age	Obesity	LR	3.086	1	.079	.250 (p = 0.72)	-
Gender	Obesity	LR	1.035	1	.309	-.106 (p = .447)	-
Office status	Obesity	LR	5.218	2	.074	.290 (p = .112)	-

Table 5. Association between age group, gender, and office status versus BMI

Age group/BMI	% within BMI	% within Middle Age
Normal weight	22.2%	22.2%
Overweight	34.6%	50.0%
Obesity	62.5%	37.8%
Gender/BMI	% within BMI	% within Female Staff
Normal weight	0%	0%
Overweight	11.5%	100%
Obesity	0%	0%
Office status/BMI	% within BMI	% within Senior Staff
Normal weight	50.0%	32.1%
Overweight	46.2%	42.9%
Obesity	87.5%	25.0%

Table 1. Predictors of hypertension

Predictors	Outcome	Test	X ² /LR Value	df	P-value	Effect size	SR
Age	Hypertension	LR	.564	1	.453	.105 (p = .448)	-
Gender	Hypertension	LR	2.207	1	.137	.222 (p = .110)	-
Office status	Hypertension	LR	.900	2	.638	.130 (p = .643)	-

Table 7. Association between overweight /obesity and hypertension

Predictors	Outcome	Test	X ² /LR Value	df	P-value	Effect size	SR
Overweight	Hypertension	X ²	0.000	1	1.000	.000 (p = 1.006)	-
Obesity	Hypertension	LR	2.324	1	.127	.222 (p = .110)	-
Abnormal WHR	Hypertension	LR	.877	1	.349	-.132 (p = .343)	-

Table 8. Correlations between the various continuous variables

	Age	Weight	Height	BMI	WC	HC	WHR
BMI	r = .194 p = .168	-	-	-	r = .688 p = .0001	r = .703 p = .0001	r = .146 p = .303
WHR	r = .233 p = .097	r = .121 p = .392	r = .082 p = .563	r = .110 p = .437	-	-	-
Systolic BP	r = .109 p = .441	r = .151 p = .286	r = -.021 p = .883	r = .174 p = .218	r = .004 p = .978	r = .260 p = .063	r = -.245 p = .080
Diastolic BP	r = .157 p = .265	r = .254 p = .069	r = .271 p = .052	r = .114 p = .422	r = .088 p = .536	r = .188 p = .181	r = -.153 p = .279

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