Prevalence of Risk factors of Cardio-metabolic disease (CMD) among elderly in two Local Government Areas of Osun State

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ABSTRACT

Background: *Cardio-metabolic disease (CMD) is a clustering of clinico-biochemical index that places an individual at increased risk for cardiovascular and as well as metabolic diseases.*

Objective: *Associated risk factors of Cardio-metabolic diseases among elderly in Ife central and East Local Governments Area of Osun State was assessed.*

Methods: *The study was descriptive cross-sectional design which involved 400 elderly age 60years and above who were randomly sampled. A structured, interviewer-administered questionnaire was used to source for information from the respondents. Obesity, hyperglycemia and high blood pressure were assessed using anthropometric indices, random blood glucose and digital sphygmomanometer respectively in line with World Health Organization standard. Data were analyzed using descriptive statistics and chi-square. A probability of P<0.05 was taken to indicate level of significance.*

Result: ***F****indings shows that 34.5% of respondents were within the age of range 60-69years. About 27.5% 20%, 22.5% and 5% were on special diet, hypertensive drug, confirmed diabetic and drinks alcohol respectively. Central obesity as revealed by WC and WHR shows that 22.5 and 26.8% were centrally obese respectively while BMI, %body fat and waist –height ratio shows that 27%, 31.5% and 35% were either overweight or obese. About 25% and 22.5%% had a raised systolic and diastolic blood pressure respectively and in the same vain, 27.5% had raised blood glucose. Significant difference was found in hypertension, BMI, WHR, WC, WHtR and %body fat, marital status and alcohol consumption across the gender (p<0.05).*

Conclusion: *The study revealed high prevalence of risk factors of cardio-metabolic disease, among the elderly in the two local governments.*

Keywords: Cardio-metabolic disease, elderly, hypertension, diabetes, central obesity

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INTRODUCTION

The health of the elderly population and the emergence of non-communicable diseases have become a major and escalating clinical and public health issues in the resurgence of urbanization, excess calorie consumption and prevalence of not only general obesity but also central obesity couple with sedentary lifestyles (1). The incidence of cardio-metabolic disease (CMD) components is rapidly increasing in developing countries most especially in sub-Sahara Africa, in which Nigeria is not left out. Cardio-metabolic disease (CMD) is an agglomeration of clinico-biochemical index that places an individual at increased risk for cardiovascular and as well as metabolic diseases

(2). Oladejo (3), also opine that CMD is a clustering of impaired glucose metabolism, dyslipidemia, hypertension and general and central obesity, is associated with the subsequent development of cardiovascular diseases as well as type 2 diabetes mellitus.

Previous studies have shown a high prevalence of various components of metabolic syndrome among adolescent and young adult (2), in the Nigerian population including health workers (9) compared to the population of high-income countries, probably because of the consequence of high consumption of calorie dense foods, poor lifestyles coupled with urbanization and higher prevalence of abdominal obesity and insulin resistance (1, 2, 3). Metabolic syndrome, which confers a high risk for cardiovascular disease is thought to be as a result of dysfunctional adipose tissue in a background of insulin resistance (1, 2). The syndrome is characterized by the presence of any three or more of obesity, hyperglycaemia, hypertension and atherogenic dyslipidaemia (2, 4, 5). It was first described nearly three decades ago to result from insulin resistance in adults but later reports suggested an occasional onset in utero (6).

The syndrome causes target organ damage through its various components; hypertension leads to left ventricular hypertrophy, renal dysfunction and peripheral vascular disease; micro vascular dysfunction further worsens insulin resistance and in turn, the hypertension that is already existent (1). It increases the risk for cardiovascular disease through increased oxidative stress, endothelial dysfunction, arterial wall stiffness and release of pro atherogenic cytokines (1).

Cardio-metabolic syndrome is thought to be the main driving force for the global epidemic of type 2 diabetes mellitus as well as for cardiovascular diseases. It has been postulated that more than 50% of the world diabetics will die of Cardio-metabolic syndrome putting cardiovascular diseases and Type 2 diabetes mellitus in global ranking in terms of morbidity and mortality (7). Individuals with Cardio-metabolic components are at greater risk of cardiovascular mortality and morbidities. Multiple factors have been demonstrated to be associated with the development of cardio-metabolic diseases and its complications; these are grouped into modifiable and non-modifiable factors. However, the modifiable factors such as the use of tobacco, excessive use of alcohol, physical inactivity, aging, unhealthy diet (high salt intake and, insufficient fruit and vegetable consumption) and obesity which is consequences of excess calorie consumption are strongly associated with cardio-metabolic diseases (8) while genetics and sex are the non-modifiable factors.

The elderly are more susceptible to the risk of these diseases more than any other group of the population due to the fact that the period between 45 and 65 years brings with it a variety of subtle changes in the body's structure and metabolic function (10). Old age is a universal phenomenon and aging is a fundamental intrinsic characteristic, with gradual loss of operational efficiency, vitality and resistance to stress (10, 11).

It is vitally important to understand the prevalence and determinants of metabolic syndrome among the elderly population, in order to apply medical and social interventions to improve the health status, and thus quality of life, for this population. Taking these considerations into account, this study aimed to investigate the prevalence of associated risk factors of Cardio-metabolic diseases among elderly (age 60years and above) in Two Local Governments Area of Osun State.

MATERIALS AND METHODS

Study Design

This study was a cross sectional survey in design state.

Study Area

The main city of Ile Ife administratively has two local governments namely Ife Central and Ife East. The headquarters of Ife Central Local Government is on Ibadan Road (Ajebandele) while that of Ife East is at Oke-Ogbo. Both local governments are comprises of 21 political wards. The population of the two according to the National population commission (12) was put at 196,220 and 221,340 respectively.

Geographically, Ile- Ife lies on longitude 4° 69'E and latitude 70° 50' N. (The climate is tropical. Like every other Southwest area, the rainy season starts April to October while the dry season lasts October to March). Ile-Ife is home to the Prestigious Obafemi Awolowo University and other important places like University Teaching Hospital Complex.

Study Population, Sample Size, and Sampling technique

A cross sectional survey conducted among elderly (Male and Female) from age 60years and above living in Ile-Ife and Ife east, Osun State, Nigeria.

Sample size was determined using the formula (14) for calculating minimum sample size

$N = \frac{Z^2 p(100-p)}{X^2}$

Where N = Sample size, Z = confidence level (which was taken as 95% with a degree of probability of 1.96%), p= prevalence of hypertension among elderly taken as usually set at 1.96 which corresponds to 95% confidence interval, P= is the prevalence of hypertension among elderly in Osun state according to (15), 100-p= percentage of young adults not hypertensive, x^2 = level of precision, taken to be 5%. A minimum sample size of 379 was obtained. Ten percent (10%) was added to make up to drop outs. A total of 400 subjects were equally selected using a multistage sampling. Two hundred elderly were randomly selected from each of the two local governments in the main Ife city with equal distribution between male and female participants

Ethical approval and Informed consent

Ethical approval reference number RUGIPO/NUD/PH/2019/108 was obtained for the study from the Ethic committee of the department of Nutrition and Dietetics Rufus Giwa Polytechnic, Owo, Ondo State. Informed written consent from the study participants was obtained after the objectives of the study were explained to them before participating in the study.

Method of Data Collection

After obtaining the necessary permission from the management authorities of the care homes, and informed written consent from the study participants, a trained students of Nutrition and Dietetics department, Rufus Giwa Polytechnic, Owo interview the elderly using a validated questionnaire, pre-tested among staffs that were above 60years in Rufus Giwa Polytechnic, Owo before it was administered to source for information on respondent's individual characteristics such as age, sex, educational level, history of cardiovascular diseases, diabetes or hypertension whether on special diet and lifestyle patterns

Anthropometric measurements

Anthropometric measurements of height and weight of the participants were taken. The standing height of participants with no shoes, were measured to the nearest 0.1cm. Participants stood with their heels together, arms to the side, legs straight, shoulders relaxed and head in the Frankfort horizontal plane (looking straight ahead) in line with World Health Organization standard (16). The participants placed their heels, buttocks, scapula and the back of their head against the vertical board of the height meter while the weight of the participants were measured using a portable scale (manufactured by SECA, Germany), with a precision to the nearest 0.1kg was used to determine weight. Individuals wore light garment with no shoes and stood on the scale, with their body equally Distributed on both feet (16) before any participant was weighed, the bathroom scale was set to zero for validity and reliable results.

Waist and Hip measurement

Waist circumference was measurement in line with the WHO protocol using a using a flexible fibre glass measuring tape positioned midway between the lowermost infracostal margin and the highest point of the iliac crest at the level of the mid-axillary line. Waist circumference was also measured to the nearest 0.1 cm, at the end of normal expiration (17, 18). Hip Circumference measurement was taken by placing the tape horizontal plane around the hip at the point of the greatest circumference with the measurement taken to the nearest 0.1cm (17, 18).

Body Fat Measurement

Body fat % was measured with a BIA device (Omron BF-212, Omron Healthcare Europe BV, Hoofddorp, and The Netherlands) following the manufacturer's instructions. The device sends an extremely weak electrical current of 50 kHz and less than 500 μA through the subject's body and combines the electrical resistance with the distance of electricity conducted and the pre-entered particulars of the subject (age, sex, weight and height) to give the body fat %. The in-built formula used by the device was not disclosed by the manufacturer.

Blood Pressure Screening of the respondents

Blood pressure was recorded twice (to the nearest 2 mmHg), using a automatic blood pressure monitor digital sphygmomanometer (OMRON HEALTHCARE INC, CHINA) on the right arm, with subjects in a sitting position and a 5-minute rest before each recording. The cuff (about 12.5 cm wide) was applied evenly and snugly around the bare arm, with the lower edge 2.5 cm above the ante cubital fossa. The first and fifth Korotkoff sounds were be taken as the systolic blood pressure (SBP) and diastolic blood pressures (DBP) respectively. The mean of the lowest two readings of systolic and diastolic blood pressures was recorded (WHO, 2017).

Random blood sugar test

About 10 mL of blood was taken from each participant at a random time regardless of time of meal consumption. Digital glucometer (oxmoron) was used to determine the blood glucose level of the respondents. A blood sugar level of less than 200 milligrams per litre (200mg/dL) or 11.1millimoles per litre (mmol/L) is regarded as normal blood glucose while a blood sugar level of equal to 200 milligrams per litre (200mg/dL) is higher suggests diabetes (IDF, 2015; ADA, 2013).

Classification of parameters

Body mass index was calculated using the formula BMI (kg/m^2) $=\frac{weight\ (kg)}{height\ (m^2)}$ (16). Body Mass Index was classified as underweight BMI (<18.5), Normal within (>18.5 ≤24.99), Overweight (>25≤ 29.99) and Obesity BMI (>30kg/m2) (16). Normal Waist-Height ratio(WHtR) was defined as <5 for both male and females while the abnormal WHtR was defined as ≥0.5 (22) and percentage body fat ≥32.0% (overweight) and ≥37.1% (obese) in black females and ≥21.7% (overweight) and ≥28.3% (obese). Truncal obesity was determined with Waist –Hip- Ratio (WHR) and waist circumference (WC). Waist –Hip- Ratio (WHR) was calculated by dividing the waist circumference by the hip circumference. WHR >0.85 for females and >0.95 for males were considered as abnormal while lesser values were regarded as normal (17). Abnormal WC was defined as WC >102 cm for males and >88 cm for females while lesser values was considered normal (17).

Statistical Analysis

Statistical analysis was performed using the statistical package for social science (SPSS version 20). Descriptive statistics such as frequencies, percentages, mean and standard deviation were used to analyze socio-demographic characteristics and all anthropometric data. For the inferential statistics, t-test was used to determine the mean differences and Chi-square employed to determine the relationship. Level of significance was set at $p<0.05$.

RESULTS

Socio-demographic characteristics of the respondents

Table 1 shows the socio-demographic characteristics of the elderly. A total of 400 respondents were sampled in the survey and included in the final analysis. About one- third ((34.5%) were within the age of 60-69years, followed by 26.3% of 70-79years. The number of the participants decreases with increase in their age. More than half (58.8%) of the respondents were married, 51.5% and 44.8% were Christian and Muslim respectively. Yoruba were the most dominating with about 69% participants. Non formal education was observed among 32.3% of the participants while less than 20% (17.5%) had tertiary education certificates. Eighteen point three (18.3%) were civil servant, 27.3% were

Table 1: Socio-Demographic data of the respondents

Variable	Male N (%)	Female N (%)	Total N (%)	X^2 ; P-value
Age				
60-69	79 (39.5)	59(29.5)	138(34.5)	1.067; 0.584
70-79	56 (28.5)	49(24.5)	105(26.3)	
80-89	47(23.5)	48(24.0)	95(23.8)	
90 above	18(9.0)	44(22.0)	62(15.5)	
Total	**200 (100.0)**	**200(100.0)**	**400(100.0)**	
Marital status				
Single	9(4.5)	6(3.0)	15(3.8)	10.178; 0.017*
Married	132(66.0)	104(52.0)	235(58.8)	
Divorced	30 (15.0)	40(20.0)	70(17.5)	
Widow	30(15.0)	50(25.0)	80(20.)	
Total	**200 (100.0)**	**200 (100.0)**	**400(100.0)**	
Religion				
Christianity	88(44.0)	118(59.0)	206(51.5)	20.626; 0.001
Islam	97(48.5)	82(41.0)	179(44.8)	
Traditional	15(7.5)	0(0.0)	15(3.7)	
Total	**200 (100.0)**	**200 (100.0)**	**400(100.0)**	
Tribe				
Yoruba	139(69.5)	147(73.5)	276(69.0)	
Igbo	52(26.5)	47(23.5)	99(24.8)	
Hausa	9(4.5)	6(3.0)	15(3.7)	
Total	**200 (100.0)**	200 (100.0)	**400(100.0)**	
Educational Qualification				
No formal education	84(42.0)	45(22.5)	129(32.3)	21.221; 0.003*
PSLC	54(27.0)	57(28.5)	111(27.8)	
SSCE/WAEC	38 (19.0)	51(25.5)	89(21.5)	
ND/NCE/ B.Sc	24 (12.0)	47(23.5)	71(17.8)	
Total	**200 (100.0)**	**200 (100.0)**	**400(100.0)**	
Household Size				
1-3	49 (24.5)	78(39.0)	127(31.8)	6.429; 0.093
4-6	72 (36.0)	52(26.0)	124(31.0)	
7-10	56 (28.0)	50(25.0)	106(26.5)	
Above 10	23 (11.5)	20(10.0)	43(10.0)	
Total	**200 (100.0)**	**200 (100.0)**	**400(100.0)**	
Occupation				
Civil Servant	33(16.5)	40(20.0)	73(18.3)	24.069; 0.019*
Trading	36 (17.5)	35(17.5)	71(17.8)	
Farming	30(15.0)	38(19.0)	68(17.0)	
Artisan	27 (13.5)	52(26.0)	79(19.8)	
Retiree	75 (37.5)	35(17.5)	110(27.5)	
Total	**200 (100.0)**	**200 (100.0)**	**400(100.0)**	
Monthly Income				
#10,000 - #50,000	78(39.0)	64(32.0)	142(35.5)	5.339; 0.149
#51,000 - #70,000	81(40.5)	99(49.5)	180(45.0)	
#71,000 - #100,000	19 (9.5)	23(11.5)	42(10.5)	
Above #101,000	22(11.0)	14(7.0)	36(9.0)	
Total	**200 (100.0)**	**200(100.0)**	**400(100.0)**	
Pension Allowance for Retirees	**(N=75)**	**(N=35)**		
Yes	30(40.0)	20(57.0)	50(45.5)	4.379; 0.233
No	45 (60.0)	15(43.0)	60(54.5)	
Total	**75(100.0)**	**35(100.0**	**110 (100.0)**	
Staying with Family				
Yes	105(52.5)	112(56.0)	117(29.3)	3.619; 0.147*
No	95(47.5)	88(44.0)	183(45.8)	
Total	**200(100.0)**	**200(100.0)**	**400(100.0)**	

*Significant at $p < 0.05$)

Table 2: Medical history and lifestyles pattern of the Respondents

Variable	Male N (%)	Female N (%)	Total N (%)	X^2 ; P-value
On hypertensive drug				
Yes	50(25.0)	30(15.0)	80(20.0)	22.069; 0.016*
No	150(75.0)	170(85.0)	320(80.0)	
Total	200(100.0)	200(100.0)	400(100.0)	
confirmed diabetics				
Yes	40(20.0)	50(25.0)	90(22.5)	4.966; 0.212
No	160(80.0)	150 (75.0)	310 (77.5)	
Total	200(100.0)	200(100.0)	400(100.0)	
On special diet				
Yes	50(25.0)	60(30.0)	110 (27.5)	4.239; 0.333
No	150(75.0)	140(70.0)	290(72.5)	
Total	200(100.0)	200(100.0)	400(100.0)	
Meal usually skipped				
Breakfast	72(36.0	56(28.0)	128(32.0)	2.966; 0.227
Lunch	61(30.5)	70(35.0)	131(32.8)	
Dinner	67(33.5)	74(37.0)	141(35.2)	
Total	200(100.0)	200(100.0)	400(100.0)	
Fruit and vegetables intake				
Yes	150(75.0)	155(77.5)	305(76.3)	5.379; 0.313
No	50(25.0)	45(22.5)	95(23.7)	
Total	200(100.0)	200(100.0)	400(100.0)	
Consumed Alcohol beverage				
Yes	60(30.0)	20(10.0)	80(20%)	22.356; 0.010*
No	140(70.0)	180(90.0)	320(80.0)	
Total	200(100.0)	200(100.0)	400(100.0)	
History of Smoking cigarrete				
Yes	70(35.0)	10(5.0)	80(20.0)	24.792; 0.013*
No	130(65.0)	190(95.0)	320(80.0)	
Total	200(100.0)	200(100.0)	400(100.0)	
still smoking				
Yes	20(10.0)	0(0.0)	20(5.0)	23.692; 0.001*
No	180(90.0)	200(100.0)	380(95.0)	
Total	200(100.0)	200(100.0)	400(100.0)	

*Significant at $p < 0.05$

retiree as the time of data collection. On monthly allowance, the average monthly income of 35.5% of the respondents was less than N50, 000, while Only 9% earned N101, 000 and above as at the time of this study. About 45.5% declared that their pension allowance comes regularly.

Medical history and lifestyles pattern of the Respondents

The table (2) presents the medical history and lifestyles pattern of the respondents. Twenty (20%) of the respondents were on hypertensive drug, similarly, 22.5% were diabetics while 27.5% were on special diet. Breakfast (32%) and lunch (32%) were the most skipped meal by the respondents. There was high (76.3%) prevalence of fruits and vegetable consumption among the subjects. Twenty percent (20%) of the respondents drink alcohol beverage, of which 10% were female and 30% were male participants. None of the female subject smoke cigarette, 10% of the male participant was smoker.

Anthropometric status of the respondents

The anthropometric status of the respondents is presented in Table 3. This study found that (7.3%) of the elderly were underweight while more than half (61.2%) were within the healthful BMI range. Overweight and obesity which are 25% and 6.5% were more prevalence among the female elderly.

Table 3: Anthropometric status of the respondents

Variable	Male N (%)	Female N (%)	Total N (%)	X^2 ; P-value
Body Mass Index (BMI)				
Underweight (<18.5kg/m^2)	14(7.0)	15(7.5)	29(7.3)	4.192; 0.041*
Normal (18.5-24.9kg/m^2)	138(69.0)	107(53.5)	245(61.2)	
Overweight(25-29.9 kg/m^2)	40(20.0)	60(30.0)	100(25.0)	
Obese (30-34.9 kg/m^2)	8(4.0)	18(9.0)	26(6.5)	
Total	**200(100.0)**	**200(100.0)**	**400(100.0)**	
Waist circumference				
<88cm<102cm(Normal)	180 (90.0)	131(65.5)	311(77.8)	40.053;0.001*
>88cm >102cm(Excess)	20(10.0)	69(34.5)	89(22.2)	
Total	**200(100.0)**	**200(100.0)**	**400(100.0)**	
Waist-Hip Ratio				
<0.85<0.90(Normal)	158(79.0)	135(67.5)	293(73.2)	20.086;0.002*
≥0.85≥0.90 (Excess)	42(21.0)	65(32.5)	107(26.8)	
Total	**200(100.0)**	**200(100.0)**	**400(100.0)**	
Waist-Height Ratio				
<0.52 (**m**),<0.48(**f**)(healthy)	157(78.5)	135(62.5**)**	292(73.0)	15.711;0.001*
≥0.53≤0.62(**m**),<0.57(**f**)(OW)	30(15.0)	47(23.5)	77(19.2)	
≥0.62(**m**),), ≥0.57(**f**), **Obese**	13(6.5)	18(9.0)	31(7.8)	
Total	**200 (100.0)**	**200(100.0)**	**400(100.0)**	
%Body fat				
Fitness	142(71.0)	118(57.5)	260(65.0)	25.253; 0.015
Overweight	34(17.0)	41(20.5)	75(18.8)	
Obesity	24(12.0)	41(20.5)	65(16.2)	
Total	**200(100.0)**	**200(100.0)**	**400(100.0)**	

%Body fat for male= ≤20% (fitness), 21-28% (overweight), ≥28.5% (obesity), female ≤29 % (fitness), 30-36% (overweight), ≥37.1% (obesity). *Significant at $p < 0.05$

Table 4: Blood Pressure and blood glucose screening of the Respondents

Blood Pressure pattern	Male N (%)	Female N (%)	Total N (%)	X^2 ; P-value
Systolic Blood Pressure				
Optimal (<120mmHg)	30(15.0)	20(10.0)	50(12.5)	19.45; 0.002*
Normal BP(120mmHg)	80(40.0)	100(50.0)	180(45.0)	
Pre HBP(120-129mmHg)	30(15.0)	40(20.0)	70(17.5)	
Grade 1 HBP(130-139mmHg)	45(22.5)	30 (15.0)	75(18.8)	
Grade 2 HBP(140-159mmHg)	15(7.5)	10(5.0)	25(6.2)	
Total	200(100.0)	200(100.0)	400(100.0)	
Diastolic Blood Pressure				
Optimal(<80mmHg)	10(5.0)	30(12.5)	40(10.0)	8.731; 0.033*
Normal BP(80mmHg)	80(40.0)	100(50.0)	180(45.0)	
Prehypertension(81-89mmHg)	50(25.0)	40(20.0)	90(22.5)	
Grade1 HBP (90-99mmHg)	60(30.0)	30(15.0)	90(22.5)	
Total	200(100.0)	200(100.0)	400(100.0)	
Blood glucose pattern (RBG)				
Normal (RBG ≤ 140mg/dl)	120(60.0)	105(52.5	225(56.2)	4.456; 0.245
Pre-diabetes(RBG >140<199mg/dl)	30(15.0)	35(17.5)	65(16.3)	
Diabetes (≥200mg/dl)	50(25.0)	60(30.0)	110(27.5)	
Total	200(100.0)	200(100.0)	400(100.0)	

*Significant at $p < 0.05$ Key: SBP; Systolic blood pressure DBP; Diastolic blood pressure

Female elderly were not just more overweight and obese but also statistically significant ($p<0.05$). Waist circumference status of the respondents revealed that 22.2% of the of the entire study population were found to have a central obesity. The prevalence of central obesity was higher among female respondents (34.5%) compare to their males counterpart (10%) and it was statistically significant ($p<0.05$). Similarly, Waist to hip ratio revealed that 23% were obese while more than two-third had normal waist to hip ratio. Significant difference ($p<0.05$), also exist between male and female participants. Female elderly (32.5%) were more at risk of cardiovascular disease than the male (21%) elderly. The prevalence of obese respondents using %body fat, shows a significant difference male (7.0%) and female (20.5%) participants ($p<0.05$) obese. Considering the waist to height ratio, a total of 27% were either overweight or obese as at the time of data collection.

Blood Pressure and blood glucose screening the Respondents

A total of 57.5% of the respondents had normal systolic blood pressure of which 45% of them were female elderly. Only 17.5% of study populations were at borderline (pre-hypertension). Some of the respondents (25%) were said to have either grade 1 or grade 2 (hypertension) of which it prevalence (30%) were found to be among male elderly. There was statistical significance in the systolic blood pressure between the male and female respondents ($p=0.002$). On diastolic blood pressure pattern, 55% of the respondents had normal blood pressure while 22.5% were hypertensive regardless of the 22.5% that were at borderline (pre-hypertension). Significance difference was observed between the diastolic blood pressure pattern the male and female respondents ($p>0.005$) (Table 4). The table also shows the random blood glucose screening of the elderly. Twenty seven point five percent were diabetics, of which 30% were females compared to 25% male participants. More than 15% were at borderline (pre-diabetics).

DISCUSSION

The present study assessed the prevalence of associated risk factors of Cardio-metabolic diseases among elderly (age 60years and above) in Ife central and East Local Governments Area of Osun State. The prevalence of the Cardio-metabolic diseases (CMD) components as revealed in the elderly population study is alarming. All the anthropometric indices of the respondents revealed the present of obesity. About 31.5% were either generally overweight or obese using BMI and were seen more among the female elderly. Higher waist circumference and waist –hip-ratio (also known as central obesity) were 22.2% and 26.8% of the entire study population. This figure was lower than what (49.7%) was reported among health workers in tertiary hospital in Lagos (23) and Jos (9). Higher waist circumference is a single predictor of type 2 diabetes mellitus and more strongly associated with cardiovascular disease (24). Similarly, the prevalence of central obesity in this study is lower than the value (59.6%) obtained among elderly in a similar study in India (25). This could be as a result of low sample size use for their study. The waist- hip ratio is thought to be a good measure of abdominal adiposity because of the distinct physiologic characteristics of different fat depots. Abdominal adiposity was more significant among the female respondents. Visceral fat has a lower threshold for lipolysis relative to subcutaneous fat and free-fatty acids released by the liver. In this way, their metabolic consequences could be accentuated (26). Percentage body fat and waist to height ratio all confirmed the presence of risk of metabolic syndrome and existed more among the female participants than their male counterpart. The highest rate of overweight/obesity was observed with %BF, and BMI while the lowest was observed with WC & WHR method. Similarly, %body fat was significantly higher in the females compare to the males in this study. A total of 35% of the respondents were either overweight or obese using the %body fat parameter. Percentage body fat estimates the body fat content of the entire body and not just those localized around waist or hip. Differences in the rates of overweight/obesity using these indices have been reported by Poirier et al. (27, 28, 9). Overweight and obesity are the fifth leading risk for global death; At least more than 2.8million adults died

each year as a result of being overweight or obese (29). The elderly in this study area must be duly taken care of so as to reduce the prevalence of obesity among them because obesity is associated with increase in mortality which may contribute to different kind of chronic diseases.

Another considered component of CMD is the present of hypertension, 20% of the elderly were on hypertensive drugs while blood pressure screening of the respondents shows that 25% and 22.5% were said to have either grade 1 or grade 2 (systolic hypertension) and diastolic Hypertension respectively. The prevalence of high blood pressure is in this study similar to what was obtained earlier among secretariat staff (27.8%), tertiary hospital workers 23.8% in Yenagoa (30;31), and among health workers in Jos (9). But, lower than 32.0% reported among civil servants and 30.0% among professionals including engineers, lawyers and accountants in Port Harcourt (Onwuchekwa *et al*. (32). Significant difference exist between the blood pressure statuses of the respondents, male respondents were more hypertensive than their female respondents contrary to the submission of Olanrewaju et al. (9) that high blood pressure are more prevalence among female health workers in Jos. Hypertension is one of the most common modifiable risk factor for cardiovascular disease which accounts for about 25% of deaths globally (33; 29). It's a disease that doesn't respect one societal status, age group and even gender classification. Globally, hypertension is the third leading cause of mortality and is a major risk factor for heart disease, stroke, and kidney failure (29). High random blood sugar level is another disturbing risk factor of cardio-metabolic syndrome seen in this study. Individuals with High random blood glucose (hyperglycemia) couple with hypertension and are at greater risk of cardio-metabolic mortality and morbidities (34). Previous studies have shown a high prevalence of various components of metabolic syndrome among the Nigeria population compared to the population of high-income countries, probably because of a higher prevalence of abdominal obesity, sedentary lifestyles, poor dietary habits and insulin resistance (35, 36, 9). In this study, 27.5% of the respondents were diabetics as against the 22.5% that were on antidiabetes drugs (Table 2) and it was more pronounced among the female respondents in the study population. This value is higher than the figure 7.1% and 7.0% obtained by Uloko et al. (37), Olamoyegun et al. (38) among adults age (20-60years) in south west Nigeria. Diabetes mellitus is a risk factor of cardio metabolic syndrome characteristics with inability of the body to metabolized macronutrients due to the insufficient/inefficient of insulin production (37; 39)

CONCLUSION

Data generated revealed that three (3) of the components of cardio-metabolic diseases such as central or abdominal obesity, high blood pressure and hyperglycemia were present among the elderly which shows that substantial number of the elderly were at risk of metabolic syndrome. This study observed prevalence of hypertension, central obesity and type 2 diabetes mellitus among the elderly in Ile Ife. The study also shows that the prevalence of the cardio –metabolic components were higher among female elderly except in hypertension than their male counterparts. There is definite cause for concern regarding the high prevalence of metabolic syndrome components among the elderly population in this study. This issue calls for urgent attention by health-care providers and policy-makers, since awareness and identification of cardio-metabolic risk factors in older persons is important for the prevention of cardiovascular diseases and diabetes consequences

CONFLICT OF INTEREST

The authors report no conflicts of interest.

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