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Original Research Article

Prevalence of Cardiovascular Risk Factors amongst Middle-Aged Adults Attending Outpatient Clinic of Ekiti State University Teaching Hospital, Ado-Ekiti, Ekiti State, Nigeria

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Abstract: ***Background*:** Cardiovascular diseases, including stroke, heart failure and kidney disease, have been common in sub-Saharan Africa for many years. These cardiovascular diseases have been linked to several risk factors which are classified as modifiable and non-modifiable risk factors. This study assessed the prevalence of cardiovascular risk factors amongst middle-aged adults attending the outpatient clinic of Ekiti State University Teaching Hospital (EKSUTH), Ado Ekiti, Ekiti state. ***Methods*:** A cross-sectional descriptive study of 206 middle-aged adults attending the outpatient clinic was carried out over 4 months. The respondents were selected through systematic sampling. The instrument used was a structured questionnaire. Data analysis was done using Statistical Package for service solution (SPSS) version 23. ***Results*:** The respondents were aged 40-64 years, with a mean age of 51.47±7.83. There was a high prevalence of cardiovascular risk profiles among middle-aged adults with the prevalence of dyslipidaemia and hypertension being 73.3% and 46.1% respectively. ***Conclusion:*** This study shows the high prevalence of cardiovascular risk factors in middle-aged adults. Family physicians should therefore actively seek to screen their patients for cardiovascular risks while also engaging in the education of patients on positively modifying the modifiable risk factors.

Keywords: Middle aged, Cardiovascular, risk factor, Prevalence.

INTRODUCTION

Chronic disorders of the heart typically progress to an advanced level before symptoms appear, often developing slowly over the course of a person's lifetime [1, 2]. Cardiovascular risk is the likelihood of a person developing an atherosclerotic cardiovascular event over a defined period [3]. Research indicates that in developing nations, persons in their middle years of productivity are more likely to be affected by cardiovascular disease (CVD) than in industrialized nations, where the condition mostly affects the retirement population [4]. This is because during the middle age, the body's metabolism begins to slow down having reached the physiological peak [5]. This increases the sensitivity of the human system to rest, stress, nutrition, and drug usage. Throughout the fourth decade, mortality keeps rising dramatically and chronic health issues linked to cardiovascular disease become a problem.5 Findings from Hamid *et al.*, posited that there is a rising prevalence of cardiovascular diseases in the sub-Sahara countries [6]. Ukpabi *et al.*, reported a 20.1% prevalence of CVD in all medical admissions over 4 years at a tertiary institution in Umuahia, Nigeria with 71% of these admissions in the age range of 35-74yrs [7]. Result from the global burden of CVD and risk factors: 2020 and beyond also discovered over three-quarters of the cardiovascular diseases occur in low and middle-income countries Nigeria inclusive [2]. More so, CVD prevalence increases after 35 years of age in both men and women. Beyond the age of 40, men and women have a lifetime risk of 49% and 32%, respectively, of developing cardiovascular disease [8]. These results underscore the fact that cardiovascular disease is a major global public health crisis with a rising prevalence,

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particularly among middle aged people across the West African sub region [9, 10].

However, cardiovascular disease risk factors are usually due to a combination of causes [11, 12]. While some of the risk factors such as age, gender, race and family history are non-modifiable, significant others including hypertension, hyperglycaemia, dyslipidaemia, and obesity are modifiable [11, 12]. The risk factors for cardiovascular diseases are categorised as non-modifiable risk factors, modifiable risk factors and a third which is termed emerging risk factors [13]. Age, gender, family history, and genetic susceptibility are among the modifiable risk factors. Atherosclerotic diet, alcohol use, physical inactivity, dyslipidemia, hypertension, obesity, diabetes mellitus, and metabolic syndrome are among the risk factors that cannot be changed [14]. The emerging risk factors include elevations in C-reactive protein (CRP), fibrinogen, coronary artery calcifications and lipoprotein(a) [15]. Globally, these modifiable factors are responsible for 61% of fatalities from CVD [10]. Research indicates that if these risk factors are reduced, life expectancy worldwide might rise by about five years, as 84% of these fatalities occur in low- and middle-income nations [16, 17].

Lowering the prevalence of these risk factors has been demonstrated to prevent CVD, which improves quality of life and lowers mortality and disability in middle-aged and older adults.3 The prevention which is a coordinated set of actions can only be achieved when risks are recognised early enough [18]. These preventions include dietary modifications, cessation of tobacco use, non-harmful use of alcohol and regular physical activities [8].

Furthermore, several studies have been conducted globally and especially within Nigeria to assess the risk of cardiovascular diseases among different populations including geriatrics, students, medical workers, and rural and urban communities [19-26]. Most of these studies have assessed the prevalence of cardiovascular disease risk in different populations, with only a few attempting to estimate the actual risk among individuals specifically in the middle age group. This study is designed to address this gap within the middle-aged group which bears most of the brunt of chronic and non-communicable diseases. The manifestations of cardiovascular diseases usually begin at this time, the prime of activities in one's career. It is thus important to assess the cardiovascular risk profile in this age group and its association with their quality of life with the intent of early discovery, modification of risk and improvement of quality of life as appropriate.

MATERIALS AND METHOD

This descriptive cross-sectional study was undertaken in EKSUTH among middle aged adults between 40-64yrs to determine the prevalence of cardiovascular risk factors from 1st of November 2020 to 28th of February 2021. EKSUTH is one of the three tertiary health institutions in Ekiti State generating referrals from three specialist hospitals, seventeen general hospitals and several privately-owned clinical practices within the state while also receiving patients from neighbouring states.

Sample size: A total of 206 adults were used for the study using Cochran sample size.

Sampling: The study population was selected using a systematic sampling technique.

Inclusion Criteria

- All consenting middle-aged adults who attended the general outpatient clinic, EKSUTH and had fasted for eight hours.

Exclusion Criteria

- Middle-aged patients who were critically or terminally ill.
- Patients with conditions that would have affected anthropometric parameters such as physical deformities and pregnancy.
- Patients with known cardiovascular diseases (Cerebrovascular disease, heart failure, ischaemic heart disease).

Data Collection

The instrument used was a four (4) sectioned interviewer-administered questionnaire drafted in English and Yoruba Languages. The instrument was pretested on about 10 middle-aged adults attending the outpatient department of the Oba Adejuyigbe General Hospital, Ado Ekiti using the inclusion and exclusion criteria, six weeks prior to the commencement of the study and there was no logistic problem encountered. Thereafter, study participants were recruited into the study after registering at the outpatient department, EKSUTH. Consent was gotten from each patient who satisfied the inclusion and exclusion criteria. The researcher then collected data. The questionnaire was divided into the following sections; identification and Assessment of Socio-demographic characteristics, Medical History, and clinical and laboratory parameter. The clinical and laboratory parameters obtained from the respondents were blood pressure, weight, height, body, fasting blood sugar and fasting lipid profile.

Study Procedure

A total of two hundred and six (206) consenting middle-aged patients selected by systematic sampling method were respondents in this study. The respondents were interviewed by the researcher and research assistants who were proficient in English and Yoruba languages and understanding of research processes. They were educated about the study, the contents of the questionnaire, the need for absolute confidentiality, the sampling technique and the data collection process.

Other health workers within the general outpatient clinic were also informed about the study.

At the beginning of daily clinic activities, the case notes of patients to be seen which were pooled at the nurses' station were checked to see those that met the inclusion criteria. Three ballot papers with the initials of the first three patients that met the inclusion criteria were rolled in a paper and a research assistant was requested to pick one ballot at random. The picked ballot was the first respondent and subsequently, every third consenting patient was the next respondent till the daily number of respondents needed was met.

The blood pressure of each respondent was taken using a mercury column Accoson® sphygmomanometer and 3M™ Littmann stethoscope. Study participants were confirmed to be fasting before the interview. Two blood pressure measurements were obtained after the subject had rested for at least 5mins in a seated position. The procedure was explained to the patient and the sphygmomanometer was checked daily for any error in calibration and adequacy of the cuff to be used. The first blood pressure measurements were recorded after obtaining socio-demographic information from the study subject, while the second was obtained at an interval of at least five minutes. All the blood pressure measurements were made on the left arm of the subject, using a cuff of appropriate size at the level of the heart. The cuff was inflated 30mmHg above the level at which radial pulse disappears. A Stethoscope was applied over the brachial artery ensuring complete skin contact and the cuff slowly deflated at the rate of 2mmHg per second. The readings were recorded to the nearest 2 mmHg. The first (appearance) and the fifth (disappearance) Korotkoff sounds were recorded as indicative of systolic blood pressure (SBP) and diastolic blood pressure (DPB) respectively. The average of two readings of SBP and DBP was used to describe the blood pressure of the participant.

The height was measured using a stadiometer mounted on a weighing scale. The height in centimetres (cm) was taken with no headgear, cap or shoes at a point where the slider touches the vertex point on the head. The weight was measured in kilograms (kg) to the nearest single decimal place while ensuring no additional weights like phones, keys or wallets are carried by the participants.

A Cardiochek® professional analyser point of care instrument was used for checking the fasting blood sugar and the fasting lipid profile. A quality control test was done every morning to ascertain the functionality of the instrument. The pulp of the finger was cleaned with a methylated spirit swab and allowed to dry. A penned single-use sterile lancet was used to prick the pulp and the first capillary blood drop was wiped off while the second blood drop was obtained using a capillary pipette. The capillary sample was applied to the already mounted glucose and lipid strips. The pulp was cleaned with dry cotton wool while the result was read within one to two minutes.

Data Analysis

All the data obtained were entered into the computer and analyzed using the statistical package for social science 23 (SPSS). The data were presented in tabular forms, graphs and charts as appropriate. Descriptive statistics, such as mean, median and standard deviations were determined.

Operational Definitions for the Study

In this study, the following definitions and categories were used:

- Age: the middle age was set at 40 – 64.
- Fasting blood glucose values ≥126 mg/dL (7 mmol/L) for diabetes having noted that participants fasted for at least 8 h.
- Hypertension: Systolic blood pressure ≥140 mmHg and/or diastolic blood pressure ≥90 mmHg.
- Hypertriglyceridaemia: Serum triglyceride level of ≥150 mg/dL (1.7 mmol/L).
- Low HDL-C: Serum HDL-C level of ≤40 mg/dL (1 mmol/L).
- Hypercholesterolaemia: Serum total cholesterol level of ≥200 mg/dL (5.2 mmol/L).
- Dyslipidaemia was defined when at least one lipid disorder (hypertriglyceridaemia, hypercholesterolaemia and or low HDL-C) was identified.
- Body Mass Index: Respondents' BMI was classified into underweight (< 18.5kg/m^2), normal weight (18.5-24.9kg/m^2), overweight (25-29.9kg/m^2) and obesity (≥ 30). Obesity was further subdivided into mild, moderate and severe.
- Smoking: considered present if smoking was reported up to the day of the interview.

RESULTS

Table 1: Socio-demographic characteristics of the study participants

Variable	Frequency (n=206)	Percent (%)
Age (years)		
40 – 44	49	23.8
45 – 49	48	23.3
50 – 54	35	17.0
55 – 59	36	17.5

Variable	Frequency (n=206)	Percent (%)
59 – 64	38	18.4
Mean ± SD	51.41 ± 7.72	
Gender		
Male	71	34.5
Female	135	65.5
Marital status		
Married	185	89.8
Widowed	15	7.3
Single	6	2.9
Religion		
Christianity	196	95.1
Islam	10	4.9
Ethnicity		
Yoruba	197	95.6
Igbo	5	2.4
Hausa	3	1.5
Igala	1	.5
Occupation		
Senior Public Servant/Professional/Businessman	81	39.3
Secondary School Teacher/Intermediate grade Public Servant	25	12.2
Artisan/Primary School Teacher/Low-grade Public Servant	19	9.2
Petty Trader/Labourer/Messenger	41	19.9
Unemployed	40	19.4
Level of education		
Tertiary	115	55.8
Secondary	54	26.2
Primary	29	14.1
No formal education	8	3.9

A total of 206 middle-aged adults attending the general outpatient clinic of Ekiti State university teaching hospital were recruited into the study over 4 months. They were aged 40-64yrs with a mean age of 51.47±7.83 years. The predominant ages were 40-44years (23.8%) and 45-49years (23.3%) while the least was 50-54yrs (17.0%). There were more female (65.5%) than male (34.5%) respondents. The majority of the respondents were married (89.9%), 15% were widowed while 2.9% were single. Christianity was the predominant religion practiced by respondents (95.1%) and a vast majority (95.6%) of the respondents were of Yoruba ethnicity. Nearly two-fifth of the respondents (39.3%) were senior public servants or professionals while the remaining were intermediate public servants(12.1%), artisans 9.2%, petty traders19.9% and 19.4% were unemployed. More than half (55.8%) of the respondents had tertiary education, 26.2% had secondary level of education, 14.1% had primary education while a paltry sum of 3.9% had no formal education.

Table 2: Social history of the study respondents

Variable	Frequency (n=206)	Percent (%)
Cigarette smoking		
Yes	6	2.9
No	200	97.1
Alcohol use		
Yes	27	13.1
No	179	86.9

Table 2 present the smoking and alcohol history of the patients. Only a handful of the respondents (2.9%) alluded to smoking while 13.1% uses alcohol.

Table 3: Blood pressure of the study participants

Variable	Frequency	Percent
SBP		
≥ 140	76	36.9
< 140	130	63.1
Mean ± SD	133.73 ± 20.98	
DBP		
≥ 90	59	28.6
< 90	147	71.4
Mean ± SD	83.11 ± 15.96	
Hypertension ≥ 140/ ≥ 90		
Yes	95	46.1
No	111	53.9
On treatment for hypertension		
Yes	80	38.8
No	126	61.2

Table 3 present an analysis of the blood pressure of study participants. The systolic blood pressure of this study ranged from 90-200mmHg while the diastolic blood pressure ranged from 43 – 150mmHg. The overall prevalence of hypertension was 46.1%. Systolic hypertension prevalence was 36.9% while prevalence of diastolic hypertension was 28.6%. The mean blood pressure for the study was 133.73/83.11mmHg. Also, 38% of the respondents were on treatment for hypertension and 61.2% were not on treatment for hypertension.

Table 4: **BMI of the study respondents**

Variable	Frequency	Percent
BMI		
Underweight	2	1.0
Normal	46	22.3
Overweight	87	42.2
Mild obesity	43	20.9
Moderate obesity	24	11.7
Severe obesity	4	1.9
Mean ± SD(Kg/m^2)	28.96 ± 5.28	

Table 4 presents an analysis of the body mass index of the study participants. Only 1% had a BMI less than 18.5Kg/m^2. A total of 34.5% were classified as obese with a BMI ≥30Kg/m^2.

Table 5: Frequency table of clinical parameters with the mean and standard deviation

Variable	Frequency (n = 206)	Percent	Mean ± SD
Total cholesterol (mmol/l)			
Normal	148	71.8	4.57 ± 1.21
Abnormal	58	28.2	
High-density lipoprotein (mmol/l)			
Normal	102	49.5	1.27 ± 0.36
Abnormal	104	50.5	
Low-density lipoprotein(mmol/l)			
Normal	91	44.2	2.82 ± 1.08
Abnormal	115	55.8	
Triglyceride (mmol/l)			
Normal	206	100.0	1.02 ± 0.54
Fasting blood glucose (mmol/l)			
≤ 7.0	158	76.7	6.69 ± 2.27
> 7.0	48	23.3	

A major proportion of the respondents (71.8%) had normal total cholesterol. Abnormal low-density lipoprotein was the most prevalent form of dyslipidaemia in this study affecting 55.8% of the study population. This was closely followed by an abnormally low high-density lipoprotein Triglyceride was normal in all (100%) of the respondents. Fasting blood sugar was greater than 7.0mmol/l in 23.3% of the respondents. The table further depicts the mean, median and range of the various biochemical parameters.

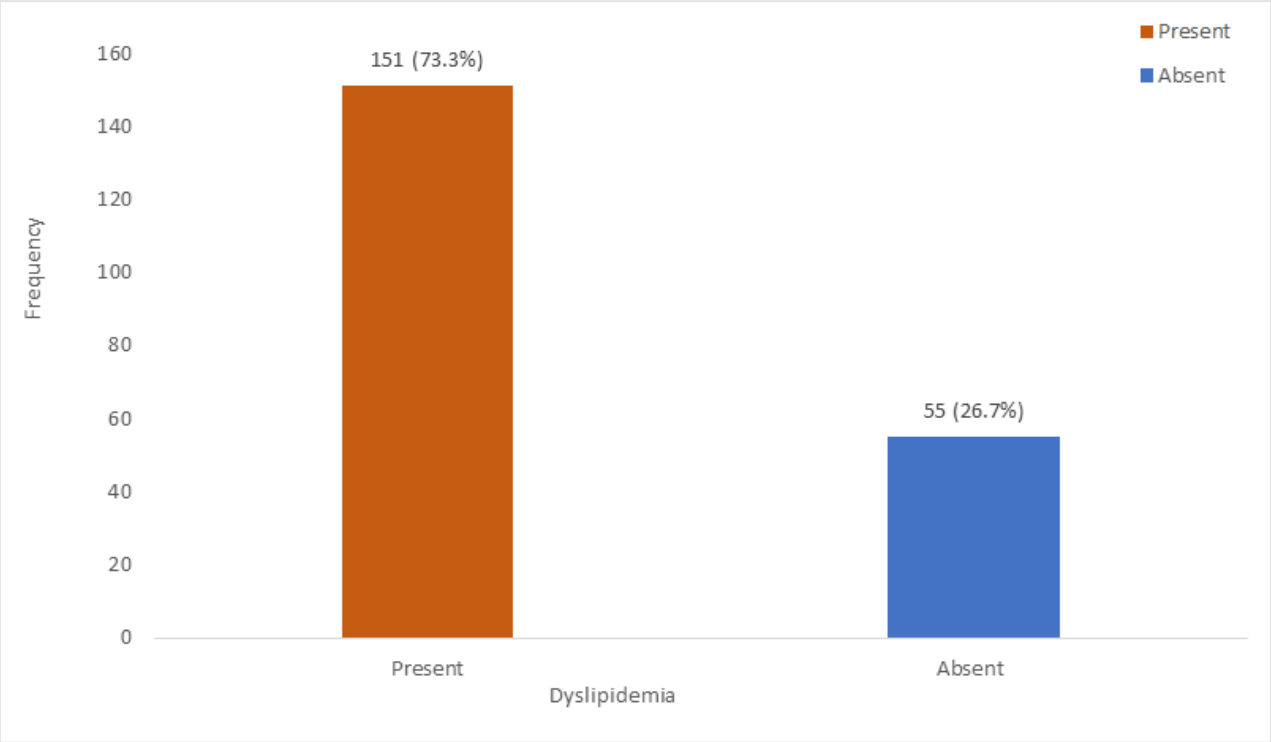

Figure 1: Bar Chart Showing the Frequency of Dyslipidemia

The bar chart below depicts the total number of study respondents that had at least one form of fasting lipid derangement. Almost three–quarters of the study participants had a minimum of one derangement in their lipid profile.

DISCUSSION

Sociodemographic Characteristics

The ages of the respondents in this study ranged from 40 to 64yrs with a mean of 51.41(±7.72). The highest number of respondents 97 (47.1%) were in the age group 40 -49 years. The mean age found in this study is similar to a study done by Okoro *et al.*, which had a mean age of 50.9(±8.1) with a majority of the participants (44.7%) in their 5th decade of life [27]. There is a preponderance of the female gender (65.5%) in this study. This is similar to findings in some other hospital-based studies [26, 34]. This has been attributed to better health-seeking behaviour amongst women than their male counterparts who may be more preoccupied with activities of daily living [50, 34]. This was attributed to the fact that men tend to accept more alternatives when compared to women. With recent advances in technology, more men tend to consult websites on the internet to seek solutions to health problems. A majority (89.8%) of the respondents were married. Most of the respondents were Yoruba 197(95.6%). This is expected as the study was conducted in Ado-Ekiti which is located in the southwest region of Nigeria where most of the residents are of Yoruba ethnicity. One hundred and ninety-six (95.1%) of the study population practised Christianity. The predominance of Christianity among the respondents possibly indicates the regional differences in religious practises in Nigeria. While Islam is prevalent in most states of the northern part of the country, Christianity is prevalent in Ekiti state which is a part of the southern region. It is worthy of note that 55.8% of the respondents had tertiary education and that there were more senior public servants /professionals (39.3%) in this study. This study, though hospital-based, was conducted in an urban centre. Ekiti state is also known as the "fountain of knowledge" and known to be one of the states with a high level of literacy. It is a state with ten tertiary institutions which probably gives more opportunities to its citizens to achieve tertiary education. This could account for the pattern observed in the educational level of the participants.

Cardiovascular Risk Factors

Smoking

The prevalence of smoking in this study was 2.9%. This is high compared to Oluyombo *et al*., study which found a prevalence of current smokers of 0.8% in a community-based study done in Ekiti [26]. The

prevalence found in this present study is also similar to the findings by Onyemelukwe *et al*., study which found a prevalence of 2.3% [24]. However, the prevalence of smoking in this present study is in variance with Okoro *et al*., study which reported a higher prevalence of smoking at 12.5% [27]. The differences might be attributed to the male preponderance in other studies compared to the present study [28]. The prevalence in this study was also less than the pooled crude prevalence of current smokers in Nigeria which was 10.4% in a systematic review and meta-analysis done by Adeloye *et al*., [29]. It was further noted that the prevalence varied across geopolitical zones in Nigeria with the highest in the North-east (32.1%, 30.0–34.1), compared to the other five geopolitical zones. The South-south region had a prevalence of 13.0% (8.7–17.3), North-central 10.3% (6.0–14.4), Southwest 8.9% (6.9–11.0), South-east 8.6% (4.1–13.0) and the lowest was in the North-west 5.4% (3.7–7.2) [29]. Despite a gradual decrease in the prevalence of smoking over the years [30], the World Health organisation's key facts on tobacco use put the prevalence at 22.3% with the prevalence at 36.7% of all men and 7.8% of all women [31]. In a study by Tomioka *et al*., the association between education and smoking prevalence, independent of occupation, they found that less-educated persons are less likely to have the opportunity to acquire knowledge about smoking and its health effects than those having higher education, leading to a higher prevalence of current smoking in those individuals [32].

Hypertension

The values used for hypertension in this study are systolic blood pressure ≥ 140mmHg and diastolic blood pressure of ≥ 90mmHg. The systolic blood pressure in this study ranged from 90-200mmHg while the diastolic blood pressure ranged from 43 – 150mmHg. The overall prevalence of hypertension in this current study was 46.1%. Systolic hypertension prevalence was 36.9% while the prevalence of diastolic hypertension was 28.6%. The mean blood pressure for this study was 133.73/83.11mmHg. The prevalence of respondents on treatment for hypertension was 38.8%. Ogunmola *et al*., [23] in the study found a hypertension prevalence of 66.4% which is higher than the prevalence found in this study. The difference in this prevalence despite the proximity of the study location may be connected to the age structure. While this study had an age range of 40-64 years, their study structure was considered 40 -88 years. Age has been linked with an increase in blood pressure [33].

Ejim *et al*., (2013) found a prevalence of 47.7% in their study on cardiovascular risk factors in middle-aged and elderly residents in South-East Nigeria: the influence of urbanization [34]. The study also noted a higher prevalence of hypertension in urban dwellers (51.1%) compared to rural dwellers (45.1%) [34]. The overall prevalence was similar to findings in this study which also both found a higher prevalence of systolic hypertension than diastolic hypertension. The study population had a similar age structure. The prevalence of hypertension is this current study is higher than findings from Ajayi *et al.*, which reported a hypertension prevalence of 33.1% [35]. however, the prevalence is this current study is higher compare to Omotoye, Ehwarieme *et al*., study and Adeloye *et al*., study where prevalence of 40%, 38.8% and 30.6% was reported respectively [36-38]. The high prevalence of hypertension in this study could be due to environmental and lifestyle-related factors. According to Ejim *et al*., urbanization is thought to encourage physical inactivity or sedentary living because of the availability of several technologies [34]. Dietary and eating patterns are also affected by urbanization by causing a shift in the composition of dietary staples and an increase in fat and sugar consumption [34].

Diabetes Mellitus

The prevalence of diabetes mellitus in this study was 23.3% while 16% of the study respondents were on treatment for diabetes mellitus. The blood sugar of the respondents ranged from 4.10 to 17.30mmol/l with a mean value of 6.69±2.27mmol/l. The prevalence of diabetes mellitus in this study is higher compared to results from other authors [39, 23]. However, this present study prevalence is a bit lower in comparison with Ogunmola *et al*., results where the prevalence of diabetes was found to be 25.7% [40]. With the present study being an outpatient hospital-based study with a high prevalence of hypertension, the similarity in the prevalence of diabetes in these two studies might not be far-fetched. Furthermore, the 23.3% diabetes mellitus prevalence in this current study is closely related to findings from Ebrahimi *et al*., with a reported prevalence of 23.89% [41]. A pattern noticed in the prevalence of diabetes mellitus and with the high prevalence found in this study is that hospital-based studies tend to have a higher prevalence of diabetes mellitus compared with community-based studies more so for rural communities. Uloko *et al*., and Afolalu *et al*., also noted this in their studies [39, 42]. The predominance of physically active occupations like crop farming and animal husbandry among the rural dwellers could be a contributory factor to the lower prevalence of diabetes mellitus in the community-based studies [42]. In a review of population-based studies on diabetes mellitus in Nigeria by Dahiru *et al*., it was observed that the prevalence of DM ranged from 0.8% in rural highland dwellers to 11% in some big urban centres in studies involving both urban and rural populations [43].

Obesity

The prevalence of obesity as defined by Body mass index (BMI) equal to or greater than 30kg/M^2 in this study is 34.5%. Forty-two per cent (42%) of the respondents were overweight (BMI 25 – 29.9Kg/M^2. The mean BMI was 28.96±5.28 (Kg/m^2) with a range of 17.69 to 44.89(Kg/m^2). This result is in disagreement with Ngwogu *et al*., [44] study which reported a higher

prevalence of obesity among their respondents. The population of the study were apparently well individuals which differs from the study population in this study which had patients attending OPD. The study also found a higher prevalence among subjects older than 40 years and females. One could thus reason that since this study had a female preponderance and had a study population aged 40-64 years, the prevalence of obesity would be higher. Onyemelukwe *et al*., found a prevalence of 28.7% among their middle-aged respondents [24]. This was higher than the overall prevalence of obesity in the study which was 24.4%. Ayoade *et al*., [45] found that 77.4% were either overweight or obese in a study done on hypertensive patients similar to this study's finding of 76.4%.

In a systematic review by chukwuonye *et al*., [46] the prevalence of overweight and obesity ranged from 20.3%–35.1%, and 8.1%–22.2%, respectively. This was also lower than the prevalence found in this present study. A community-based survey on the cardiovascular risk factors in South-eastern Nigeria by Eze *et al*., [47] found a lower prevalence of obesity (11.3%) compared to this present study. The difference might be due accounted for by the nature of the occupation of most of their respondents who were farmers, traders and artisans engaged in more physical activities than found in this study. Akarolo-Anthony *et al*., [48] found an obesity prevalence of 33.8%. The Akarolo-Anthony *et al*., [48] study concluded that two-thirds of urban, professional, high socio-economic status Nigerian adults were either overweight or obese. These conform to the findings in this present study, whose respondents were mostly senior public servants, professionals and businessmen. This might be due to a sedentary life style related to long sitting hours in the office.

Dyslipidaemia

Dyslipidaemia refers to the derangement of at least one of the components of the lipid profile. This was the most prevalent cardiovascular risk factor in this study with a prevalence of 73.3%. Abnormal low-density lipoprotein was most prevalent (55.8%) of the individual components. This was followed by abnormal high-density lipoprotein (50.5%). There were no abnormal findings in triglycerides. In a cross-sectional study by Okafor *et al*., [49] reported the prevalence of dyslipidaemia to be 54.5% which is lower than the finding in this study. Onyemelukwe *et al*., [24] found an overall dyslipidaemia prevalence of 71% in the population studied while the prevalence was 78.7% in the subgroup aged 40-60years. Low HDL-c was the commonest dyslipidaemia found in their study. The findings by Onyemelukwe *et al*., [24] were similar to the findings in this index study. It can be concluded from this study that the prevalence of dyslipidaemia is high in the middle-aged group especially, in urban areas. This could be attributed to the more sedentary lifestyle and consumption of junk.

General Observations on Cardiovascular Risk Factors

The most prevalent cardiovascular risk factor in this study was dyslipidemia 73.3%. About 55.8% and 50.5% of the respondents had an abnormal low-density lipoprotein (LDL) and high-density lipoprotein (HDL) respectively. This was followed by hypertension which was present in about 46.1% of the study population. 34.5% were obese while diabetes mellitus and cigarette smoking were the least prevalent. These findings are in contrast to the findings of the study done by Ejim *et al*., on cardiovascular risk factors in middle age and elderly residents in southeast Nigeria which found hypertension and obesity to be the most prevalent factors while hypercholesterolaemia was the least [34]. Both studies had diabetes mellitus as one of the least prevalent factors. Some of the differences in the findings might be accounted for by the difference in the mean and range of the age used for the studies. The mean age for this study was 51.41 ±7.72years compared to 56.3 ±9.9 years. Another possible cause of difference was the population studied. This discrepancy might also be be due to incidental findings of previously undiagnosed diabetes mellitus.

Onyemelukwe *et al*., [24] in their study found that over 90% of subjects had more than one of six selected modifiable risk factors with dyslipidaemia been the most prevalent cardiovascular risk factor recorded in 71.1% of the participants analysed similar to findings in this study. However, unlike this study which found low-density lipoprotein as the most prevalent dyslipidaemia, they found low HDL-C as the most prevalent. Their findings on the prevalence of diabetes (21.4%) and smoking (2.3%) were similar to the findings in this research which found a prevalence of 23.3% and 2.9% respectively. It was observed that the findings on the mean of total cholesterol (4.57mmol/l), systolic blood pressure (133±20.98mmHg) and diastolic blood pressure (83.11±15.96mmHg) were similar to the 4.7mmol/L, 134 ± 24mmHg and 82.4 ±14.9mmHg respectively found in the study done by Ejim *et al*., [34] These similarities might be a result of the seemingly similar socio-demographics of the respondents. However, there were differences in the mean body mass index which was in the overweight range for this study while Ejim *et al*., reported 24.9Kg/m^2 which fell within the normal range [34].

The prevalence of obesity in this study was 34.5%. This is not unexpected as most of the respondents were in the senior and intermediate cadre of their professions with higher socio-economic factors. Another factor that could be responsible for the high prevalence of obesity is that most of the respondents were urban dwellers with a higher propensity for a sedentary lifestyle and consumption of junk. Most of the senior civil servants tend to sit for long hours in the office, and they have access to vehicles for mobility thus reducing their level of physical activity.

CONCLUSION

This study assessed prevalence of cardiovascular risk factors amongst middle aged adults attending outpatient clinic of Ekiti State University teaching Hospital (EKSUTH), Ado Ekiti, Ekiti state. There was high prevalence of cardiovascular risk factors among middle-aged adults attending outpatient clinic in Ekiti State University Teaching Hospital, Ado Ekiti. The most prevalent cardiovascular risk was dyslipidaemia at 73.3%. This was followed by hypertension and obesity which was present in 46.1% and 34.5% respectively. While diabetes prevalence was low in this study, the prevalence is high compared to other studies around Nigeria.

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RECOMMENDATION

Cardiovascular risk factors are highly prevalent in Nigerian subjects attending out-patient clinics. Moreover, many subjects were undiagnosed and therefore unaware of their cardiovascular risk status. Opportunistic screening alongside intensive national, multisectoral education or risk factor education is needed and should be scaled up nationwide and rolled out in both urban and rural communities in Nigeria.

The proportion of patients in the intermediate and high-risk categories suggest the need for necessary preventive intervention strategy to be part of health care program in the healthcare facilities. Primary prevention, early detection and prompt, effective control, as well as health promotion strategies, are critical in the attempt to reverse the global burden of cardiovascular diseases.

Declaration of Competing Interest

The author declares that he has no known competing publication interests or personal relationships that could have appeared to influence the work reported in this paper.

Limitation of the Study

This was a cross-sectional study and as such inferences from the observed associations cannot be strongly drawn. It was a clinic-based urban study; the study sample is only representative of middle-aged patients attending a General outpatient clinic which may not necessarily be a complete reflection of the true picture in the general population.

Ethical Approval: Approval code of ethics with number EKSUTH/A67/2019/11/001

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