

*Original Research Article*

# Non communicable disease prevalence among overweight and obese outpatient clinic attendees in the Niger Delta Region of Nigeria

Alphonsus Udo Idung MB, BS FWACP<sup>\*1</sup>, Sunday Bassey Udoh MB, BS; FWACP<sup>1</sup> and Festus Abasiubong MB, BCH; FWACP<sup>2</sup>

Abstract

<sup>1</sup>Department of Family Medicine,  
Faculty of Clinical Sciences, College  
of Health Sciences University of Uyo  
Nigeria

<sup>2</sup>Department of Psychiatry, University  
of Uyo, Nigeria

\*Corresponding Author's E-mail:  
[dridung@yahoo.com](mailto:dridung@yahoo.com); Tel:  
+234(0)8069768262

Overweight and obesity are global health problems which are reported to account for 44% global burden of diabetes mellitus, 23% of ischaemic heart disease and 7-41% of some malignancies. The objective of the study was to describe the prevalence of non-communicable diseases amongst outpatient clinic attendees in Uyo in the Niger Delta region of Nigeria. This was a cross-sectional descriptive study done between October 2011 and March 2012. Using a systematic sampling technique, 584 subjects aged 18-65 years were recruited, data were collected with a structured questionnaire. Subjects were measured for height, weight, waist and hip circumferences. Body mass index (BMI) and waist-hip-ratio (WHR) were calculated. Subjects with a BMI of 25.0 kg/m<sup>2</sup> - 29.9 kg/m<sup>2</sup> were regarded as being overweight whilst a BMI of > 30.0 kg/m<sup>2</sup> was regarded as obese. Subjects with a WHR of > 0.90 for men or > 0.85 for women were regarded as having abnormal WHR. Of the 584 subjects, 196 (36.6%) were men and 388 (66.4%) women. The mean age for men was 43.3±17.8 years while the mean age for women was 50.2±13.6 years. The prevalence of overweight amongst men was 39.8% versus 31.7% for women; obesity in men was 28.0% versus 52.0% in women. There was a significant relationship between obesity and the presence of hypertension among respondents in this study (p=0.008). There was also a significant relationship between obesity and the presence of osteoarthritis among respondents in this study (p=0.043). Overweight and obesity are now common in our environment. The health consequences of obesity such as hypertension and osteoarthritis are also becoming more apparent. There is therefore need for more public about the health consequences of big body size.

**Keywords:** Diabetes mellitus, hypertension, non-communicable diseases, obesity, osteoarthritis, overweight

## INTRODUCTION

Overweight and obesity are global public health problem because of their effects on individuals, families and communities. About one billion people have been reported to be overweight with more than 300 million obese (World health organization, 2014). Obesity have been reported to account for 44% global burden of diabetes mellitus, 23% of ischemic heart disease and 7-

41% of some malignancies (World health organization, 2014). It is estimated that of the projected 64 million deaths in 2015, 41 million (64%) will result from non-communicable diseases (NCDs) of which obesity is a major contributor (WHO, 2005).

Non communicable diseases (NCDs) are now the major cause of deaths accounting for 60% of all mortality

globally (Healthy Caribbean Coalition (HCC) NCD Alliance, 2011). About 35 million people die every year from these silent killers, 18 million of whom are women (Healthy Caribbean Coalition (HCC) NCD Alliance, 2011). Moreover, NCDs will be responsible for three times as many disability adjusted life years (WHO Comparative quantification of health risks, 2004), and nearly five times as many deaths as communicable disease, maternal, perinatal and nutritional conditions put together (WHO the Global burden of disease, 2004). According to world health organization, 87% of all deaths in the United States of America are due to Non-communicable diseases (WHO Maps, 2011).

The outlook for Africa is frightening as most countries are poor and the resources devoted to healthcare services are low, with much of the resources committed to combating communicable diseases such as HIV/AIDS, tuberculosis and malaria. The reason is because of the adverse effects of these diseases on the economic development of most countries, thereby leaving the increasing burden of non-communicable diseases (NCDs) unchecked (Mafunda et al., 2006).

Nigeria, a low to middle income country in sub-Saharan Africa is not immune to the scourge of non-communicable diseases, but the paucity of reliable data on health and economic burdens resulting from non-communicable diseases have militated against actions designed to curb the rising toll of NCDs (Ige et al., 2013).

Published reports on the prevalence of NCDs among overweight and obese outpatients in Uyo, a community in the Niger Delta Region, South-South Nigeria are, however, scarce in the scientific literature. This study is therefore aimed at describing the prevalence of NCDs among overweight and obese family medicine outpatient clinic attendees in Uyo, Niger Delta region of Nigeria.

It is hoped that the findings would add to the pool of knowledge, for purposes of increasing awareness on the burden and scope of NCDs among obese outpatients which could help shape policy formulation toward curbing the emerging disaster.

## RESEARCH METHODS AND DESIGN

### Location of the study

This study was carried out at the family medicine clinic of the University of Uyo Teaching Hospital (UUTH). UUTH is located in the outskirts of Uyo the capital of Akwa Ibom State of Nigeria. Nigeria is divided into six geopolitical zones as follows: North-East, North-West, North-central, South-East, South-West and South-South. Uyo, the Akwa Ibom State capital is located in the South-South geopolitical zone, which is often referred to as the Niger Delta Region of Nigeria. It is one of the major oil producing areas of Nigeria. UUTH is the only tertiary and referral health institution in the state and its environs.

### Subjects

The study was carried out among outpatients attending the family medicine clinic for medical problems. A total of 584 consenting adult male and female subjects aged between 18 and 65 years participated in this study. Sample size for this study was calculated using  $n = z^2pq/d$  (WHO, 2005; RAO, 2007) where 'n' is the desired sample size, 'z' represents standard normal deviation set at 95 % confidence level which corresponds to 1.96, 'p' is the prevalence of NCD quoted in this study (World Health Organization, 2011), 'd' is the precision which at 95% confidence interval is 5%. The calculated sample size was 372. Two thousand seven hundred (2700) respondents were sampled during the study period. They were recruited using a systematic sampling method with a sampling interval of seven. Numbers ranging from one to seven were assigned to the first seven subjects who met the inclusion criteria. The first respondent was chosen by simple balloting at which one of the numbers from a basket containing the assigned numbers was selected. Subsequently, every 7th subject was recruited into the study.

Ethical approval for the study was obtained from the UUTH Health Research and Ethical Committee. A pre-test of the research proforma was performed to determine its applicability, experience and logistic problems

## METHODS

This study took place between October 2011 and March 2012, 584 consenting male and female subjects were recruited. Weight was measured in kilograms to the nearest 0.5kg using a Hanna calibrated bath-room scale, model: BR 9011. Each subject was weighed wearing light clothing without shoes or stockings. The height of the subjects was measured with an improvised wooden stadiometer mounted on a vertical wall with the respondent standing erect against the wall on a horizontal floor without shoes. The head was placed to ensure that the external auditory meatus and the angle of the eye were on a horizontal line. The height was measured in meters to the nearest 0.1cm. Body mass index (BMI) was calculated as the weight (kg)/ height (m)<sup>2</sup> (ht/m<sup>2</sup>) (Garrew and Webster, 1985). A non-stretch tape was used to measure the body circumferences. The smallest circumference between the xiphi sternum and the umbilicus on expiration was taken as the waist circumference. Measurements were taken to the nearest 0.1cm after normal expiration with the subject in an upright position. Hip circumference was measured to the nearest 0.1cm at the maximum posterior protuberance of the buttocks while the subject was standing upright with feet together.

Overweight was defined as BMI of 25.0-29.9 and

**Table 1.** Characteristic of the study population

<b>Variables</b>	<b>Subjects</b>	
	<b>Female (F) (n=388[%])</b>	<b>Male (M) (n=196[%])</b>
<b>Socio demographic age in years</b>		
18-24	9 (2.3)	12 (6.1)
25-34	120 (30.9)	38 (19.4)
35-44	118 (30.4)	58 (29.6)
45-54	94 (24.2)	56 (28.6)
55-64	42 (10.8)	20 (10.2)
65	5 (1.3)	12 (6.1)
<b>Marital status</b>		
Single	64 (16.5)	45 (23.0)
Married	281 (72.4)	145 (74.0)
Divorce/sep.	8 (2.1)	2 (1.0)
Widowed	35 (9.0)	4 (2.0)
<b>Education level</b>		
No formal education	8 (2.1)	1 (0.5)
Primary School	54 (13.9)	25 (12.8)
Secondary school	92 (23.7)	51 (26.0)
Post secondary school	234 (60.3)	119 (60.7)
<b>Income</b>		
Low	217 (56.0)	96 (49.0)
Middle	108 (27.8)	65 (33.2)
High	63 (16.2)	35 (17.8)
<b>Occupation</b>		
Non-skilled	75 (19.3)	28 (14.3)
Skilled	115 (29.7)	69 (35.2)
Professional	198 (51.0)	99 (50.5)
<b>Place of residence</b>		
Urban	244 (62.9)	123 (62.8)
Rural	144 (37.1)	73 (37.2)
<b>Body mass index (kg/m<sup>2</sup>)</b>		
< 18.5	-	-
18.5-24.9	63 (16.2)	63 (32.1)
25.0-29.9	123 (31.7)	78 (39.8)
30.0-34.9	108 (27.8)	44 (22.4)
35.0-39.9	69 (17.8)	9 (4.6)
≥ 40.0	25 (6.4)	2 (1.0)
<b>Waist circumference</b>		
≤ 88cm (F)	84 (21.6)	-
≤ 102cm (M)	-	171 (87.2)
≥ 88cm (F)	304 (78.4)	-
≥ 102 cm (M)	-	25 (12.8)
<b>Quartiles of waist-hip ratio</b>		
≤ 0.84	136 (35.0)	57 (29.1)
0.85-0.89	142 (36.6)	65 (33.1)
> 0.93	110 (28.4)	74 (37.8)

obesity as BMI  $\geq$  30.0. Men and Women with waist circumference (WC) values of  $\leq$  94 and  $\leq$  80cm respectively, were considered to have a normal WC, whereas Men and Women with WC values  $\geq$  94 and  $\geq$  80cm respectively were considered to have high WC (obese); whereas subjects with a waist-hip-ratio (WHR) of  $>$  0.90 for men or  $>$  0.85 for women were regarded as

having abnormal WHR (Waist Circumference and waist-hip ration, 2008). Additionally each subject was assessed using an interviewer-administered structured questionnaire containing such information as age, marital states, highest level of education attained, income (in Nigerian Naira denomination) using the approved wage structures in the Nigeria public service (National Minimum

**Table 2.** Prevalence of medical conditions of subjects

Medical history	Subjects		
	Non-obese (n[%])	Obese (n[%])	p-value
Hypertension	104 (31.8)	110 (42.8)	0.008*
Diabetes mellitus	48 (14.7)	48 (18.7)	0.24
Osteoarthritis	25 (7.6)	33 (12.8)	0.043*
Others (malaria, dyspepsia, enteric fever etc)	24 (7.3)	23 (8.9)	0.58

\*Statistically Significant

wage Act, 2011). Other information elicited with the questionnaire included occupational status of the subjects: Non-skilled occupation (Labourers, pensioners, students); skilled occupation (tailors, teachers without university degrees) and professionals (lawyers, soldiers, teachers with university degrees). The questionnaire also elicited information with regard to the medical condition of the subjects. Diabetes mellitus was diagnosed based on the 2011 revised criteria by the Expert Committee on the diagnosis and classification of diabetes mellitus which recommends the diagnosis of diabetes based on two fasting plasma Glucose (2FPG) levels of 126mg/dl (7.0mmol/L) or higher, or two, 2-hours post prandial Glucose (2hpgg) reading of 200mg/dl(11.1mmol/L) or higher after a glucose load of 75g or two Casual glucose readings of 200mg/dl (11.1mmol/L) or higher or glycosylated Haemoglobin (Hb1c) of  $\geq 6.4\%$  (International Diabetes Federation (IDF), 2011).

Hypertension was diagnosed based on the joint National Committee on prevention, detection, evaluation and treatment of High Blood pressure criteria which uses an average blood pressure of  $\geq 140/90$  mmhg after two readings (Chobanian, 2003).

Osteoarthritis was diagnosed based on the American College of Family Physician diagnostic Criteria of joint pain and stiffness of insidious onset occurring in a middle-aged or elderly person involving the hip, knee or hand (Nisha and Nancy, 2000).

### Data analysis

Statistical analysis was done using the statistical package for social sciences (Spss) version 17.0 (IBM corporation.) Distribution and cross-tabulation were generated-test was used to compare means and chi-square was used to compare proportions. A p-value of 0.05 was used to determine the level of statistical significance.

### RESULTS

Of the 584 subjects recruited into the study, 36.6% (n=196) were males, whilst 66.4% (n=388) were females.

Table 1 shows the sociodemographic characteristics

of the subjects. There was a statistically-significant difference between the mean age of women (50.2[SD=3.6]) and men (43.3 [SD=17.8]) (p=0.000). Subjects between the ages of 25 and 54 were more obese (p=0.000). Overweight and obesity was more prevalent amongst the married respondents in this study (p=0.002). Women had a mean BMI of 30.7kg/m<sup>2</sup> (SD=5.7) versus 27.6kg/m<sup>2</sup> (SD=4.5) for men (p=0.000). Women had a mean waist circumference of 95.3cm (SD=12.4) versus 91.2cm (SD=11.2) for men (p=0.000). The mean hip circumference for women was 109.4cm (SD=14.2), whilst the mean hip circumference for men was 103.0cm (SD=10.4) (p=0.000). Approximately 65.0% of the women had an abnormal WHR compared with 37.8% of the men.

Table 2 shows the prevalence of medical conditions amongst the respondents in this study. There was a statistically-significant difference (p=0.008) between the presence of hypertension and the presence of osteoarthritis (p=0.043) when comparing the obese versus the non-obese subjects in this study.

### DISCUSSION

Findings from this study have shown that overweight and obesity along with their primary co-morbidities are now serious health problems among family medicine clinic outpatients in Uyo, Niger Delta Region of Nigeria. The prevalence of overweight among respondents in this study was 39.8% versus 31.7% for men and women respectively. This figure is however lower than the reported overweight prevalence of 41.9% versus 62.0% for male and female respondents respectively in North Central Nigeria (Wahab et al., 2011). The high prevalence of overweight among respondents in this study is suggestive that the rate of obesity will continue to rise unless drastic action is initiated now. The prevalence of obesity in this study was 52.0% for women and 28.0% for men. This finding was higher than 29.8% versus 9.3% reported among adult female and men respondents respectively in North central Nigeria (Wahab et al., 2011).

Sola et al., 2012, however, reported obesity prevalence rate of 36.2% for females and 8.0% for males among urban and rural population of Abuja residents in

North central of Nigeria. The differences in the reported prevalence of obesity amongst different workers in Nigeria might be due to the differences in the study design as well as the study subjects, but it is nonetheless important to note that obesity is now a serious health issue in Nigeria, and deserves good attention because of associated morbidity and mortality. In this study, hypertension was a significant co-morbidity among obese respondents. The prevalence rate of hypertension among obese respondents in this study was 42.8%. This rate was higher than that reported among general hospital patients in Imo State, South-East Nigeria (16.3%) (ILOH et al., 2011). Maiduguri, North East Nigeria (15.2%) (Okesina et al., 1999) and Edo State, South-South Nigeria (20.2%) (Omuemu et al., 2007). The differences might be due to epidemiological characteristics of the subjects. Although not statistically significant, the prevalence of diabetes mellitus among obese respondents in this study was 18.7%. This figure is higher than 6.8% reported among medical admissions in Port Harcourt, South-South Nigeria (Unachukwu et al., 2008). The observed differences in diabetes mellitus prevalence rate could be due to such other factors as environment, socio-economic as well as genetic factors. Further studies are hereby suggested. The prevalence of osteoarthritis among obese respondents in this study was 12.8%. This rate was lower than 16.1% and 83.9% reported among elderly male and female patients respectively in Osun State, South-West Nigeria (Faronbi and Fajemilehin, 2012). This observed trend might be related to the presence of obesity which has been implicated as a predisposing factor in osteo-arthritis (Ehrentraut, 2014).

### Limitations

One limitation of this study is that the data used is cross-sectional. It would have been more appropriate to follow up with individuals over time so as to ascertain the changes in their BMI as well as the presence of other risk factors. Other limitations include the descriptive nature of the study, small sample size and the short duration of the study.

### CONCLUSION

The findings of this study have shown that non-communicable diseases are common among obese outpatients in the Niger Delta Region of Nigeria. The economic burden of obesity is therefore serious, because the costs of treatment of obesity related diseases are not only borne by the obese people themselves but also by their families and all contributors to the Nigerian National Health Insurance Scheme (NHIS).

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