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Prevalence of Obesity and its primary comorbidities among patients attending the dietetics out-patient clinic in a tertiary health institution in southwestern Nigeria

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Abstract

Objective: The study assessed the prevalence of obesity and its co-morbidities among patients attending the dietetics outpatient clinic of the hospital.

Methods: The prevalence of obesity and its co-morbidities were assessed in this retrospective study from the available in the outpatient clinic of the Dietetics Department in University College Hospital Ibadan, Oyo State. Age, gender, occupation, religion, height, weight, diagnosed diseases were extracted from the record of individuals who presented at the clinic over 72 months. Data obtained was analyzed using the Statistical Package for Social Sciences (SPSS) version 20.

Result: A total of 3248 patients' records were assessed. Of these, 1174 (36.15%) patients met the criteria for obesity according to their recorded BMI; 614(52.3%) had obesity class I (BMI 30–34.9), 343(29.2%) had obesity class II (BMI 35–39.9) and 217(18.5%) had obesity class III (BMI ≥40). Obesity was significantly higher amongst females than males ($p<0.05$). The most prevalent single co-morbidity was diabetes 22.3%, while the most prevalent double co-morbidity was hypertension/diabetes 22.9%.

Conclusion: The prevalence of obesity amongst patients was significant. Diabetes and hypertension were the most dominant co-morbidity. Interventions should be developed to combat the increasing prevalence of the diseases and these should involve educating the public and clinical management of the diseases upon identification.

Keywords: Body mass index, comorbidities, Diabetes, Obesity

Plain English summary

This present study conducted in University College Hospital Ibadan assessed obesity and its co-morbidities among patients attending the dietetics outpatient clinic of the hospital using a retrospective design. The present study revealed that the prevalence of obesity among patients was significant and the dominant co-morbidity associated with obesity was diabetes and hypertension. Screening for obesity and its co-morbidities should be integrated as a baseline assessment in clinics.

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Background

Obesity is a non-communicable medical disorder defined as body mass index (BMI) ≥ 30 kg/m2 (1). It is a major public health and economic problem of global significance with prevalence rates increasing in all parts of the world; both in developed countries and in poorer nations. It is a common nutritional disorder in industrialized countries and is becoming increasingly prevalent in developing countries due to changes in lifestyle (2). Obesity and health problems associated with them are now so common that they are replacing the more traditional public health concerns such as under-nutrition and infectious disease as the most significant contributors to global ill health (2). Obesity is associated with diseases such as hypertension, heart diseases, atherosclerosis, certain types of cancer, dyslipidemia, type 2 diabetes mellitus, post-surgical complications with poor tissue healing, and infections (3, 4, 5).

Obesity is a public health problem in Nigeria from the dual aspects of prevalence and consequence. The prevalence of obesity in Nigeria increased from 8.1% in 2010 to 22.2% in 2013, an increase of more than two times between 2010 and 2013. A survey data in 2010 also revealed that the prevalence of obesity among individuals aged 30 years and above increased by 47% and 39% in men and women respectively between 2002 and 2010 in Nigeria (6, 7, 8, 9).

In Nigeria, obesity is not generally regarded as a disease until complication sets in; In fact, a mild degree of obesity is socially acceptable and desirable (10). It has been reported to be commonly seen among the affluent business executives and middle-aged females with a sedentary lifestyle, it is also seen among those in the catering profession who are exposed to food preparation and consumption (11).

There is a rising burden of obesity and other related co-morbidities in developing countries including Nigeria; and to combat this, there is a need to have adequate knowledge of the prevalence of the diseases across the regions of the country to develop strategies to address them appropriately, this need formed the basis for this study.

Methods

The study which was retrospective in design was carried out at the dietetics clinic of the medical out-patient clinic, University College Hospital Ibadan, Oyo state Nigeria. The records of patients that attended the dietician's clinic were used. The information retrieved includes demographic characteristics such as age, gender, religion, occupation, individual's weight, height, body mass index, and diagnosis. Required information about individual subjects was entered in a table. This table served as the primary source of data for statistical analysis. Data collected covered a period of 72 months, from 2010 to 2015.

Using the WHO classification (1), Obesity (≥30 kg/m2) was categorized as: class one (BMI=30.0 −34.9), class two (BMI=35.0–39.9), and class three (BMI≥40).

Data collected were analyzed using Statistical Package for Social Sciences (SPSS version 20) using descriptive statistics such as frequency, percentage, cumulative percentage, means, and standard deviation. Chi-square was used to assess the association among the variables. All statistical analyses were set at a 5% level of significance.

Results

A total of 3248 patients' records were assessed in the study. The ages of the respondents ranged from 18-92 years with a mean age of 51.75±12.5 years. Sex distribution showed males making up 20.2% and females 79.8%. More than half 699(59.5%) of the patients were Christians while 474(40.4%) were Muslims. Those who were employed with white-collar jobs were 342(29.1%), semi-skilled and skilled 546(46.5%) and those unemployed were 286(24.4%). (See table 1)

Table 1: Gender distribution of demographic characteristics

Variables	Male n(%)	Female n(%)	Total n(%)
Gender	237(20.2)	937(79.8)	1174(100)
Age (years)			
18-30	9(0.8)	52(4.4)	61(5.2)
31-40	24(2)	142(12.1)	166(14.1)
41-50	98(5.8)	225(21.7)	323(27.5)
51-60	75(6.4)	268(22.8)	343(29.2)
≥61	61(5.2)	220(18.7)	281(24.5)

Religion			
Christianity	139(11.8)	560(47.7)	699(59.5)
Islam	98(8.3)	376(32)	474(40.4)
Occupation			
Employed (white-collar)	73(6.2)	269(22.9)	342(29.1)
Employed (semi-skilled and skilled)	104(8.9)	442(32)	546(46.5)
Unemployed	60(5.1)	226(19.3)	286(24.4)

The results for anthropometry showed that males had significantly higher weight (53.3±11.8 kg) and height (1.67±0.7m) than females ($p < 0.05$), while females had significantly higher BMI (36.4±5.5 kg/m2) than males ($p < 0.05$). A total of 1174 (36.15%) patients met the criteria for obesity according to their recorded BMI; 614(52.3%) had class I obesity (BMI 30–34.9), 343(29.2%) had class II obesity (BMI 35–39.9) and 217(18.5%) had class III obesity (BMI ≥40). The overall prevalence of obesity among the patients was 36.15%. (See Tables 2 and 3).

Table 2: Gender distribution of anthropometry

Variables	All	Male	Female	p-value
Mean weight (Kg)	91.6±15.4	95.9±13.9	90.6±15.6	0.000
Mean height (m)	1.6±0.07	1.67±0.73	1.58±0.69	0.000
Mean BMI (kg/m^2)	35.91±5.34	34.1±4.3	36.4±5.5	0.000
Mean age (years)	51.75±12.5	53.3±11.8	51.3±12.6	0.000

$p<0.05$ statistically significant

Table 3: Gender distribution of obesity

Obesity class	Male n(%)	Female n(%)	Total n(%)
Obesity (class 1)	161(13.7)	453(38.)	614(52.3)
Obesity (class 2)	57(4.9)	286(24.4)	343(29.2)
Obesity (class 3)	19(1.6)	198(16.9)	217(18.5)

The association between obesity and gender was significant ($p<0.05$) with obesity higher among females than males. Obesity was observed to be more among the older age group and it increased with age ($p<0.05$). There was no significant relationship between obesity and employment status ($p>0.05$), and obesity and religion ($p>0.05$). (See table 4)

Table 4: Relationship between obesity and demographic characteristics

Variable	Obesity class 1	Obesity class 2	Obesity class 3	X²	p-value
Gender				34.1	0.000
Male	161(13.7)	57(4.9)	19(1.6)		
Female	453(38.6)	286(24.4)	198(16.9)		
Age (years)				30.6	0.001
18-30	36(3.1)	11(0.9)	14(1.2)		
31-40	75(6.4)	45(3.8)	46(3.9)		
41-50	153(13)	109(9.5)	61(5.2)		
51-60	175(14.9)	111(9.5)	57(4.9)		
≥61	175(14.9)	67(5.7)	39(3.4)		
Occupation				9.1	0.057
Employed (White collar)	179(15.2)	107(9.1)	56(4.8)		

Employed (semi-skilled and skilled	267(22.7)	166(14.1)	113(9.6)		
Unemployed	168(14.3)	70(6)	48(4.1)		
Religion				3.22	0.521
Christianity	372(3.1)	203(17.3)	124(10.6)		
Islam	242(20.6)	139(11.8)	93(7.9)		
Others	0	1(0.1)	0		

p<0.05 statistically significant

Co-morbidities of obesity were grouped into one, two, and three morbidities respectively. More than half 59.2% of the patients had one comorbidity, 33.9% and 3.1% had two and three co-morbidities respectively. The single co-morbidities found among the patients were diabetes, hypertension, dyslipidemia, arthritis, and renal diseases respectively. The most prevalent single co-morbidities were diabetes 22.3% and hypertension 14.1%, while the most prevalent double co-morbidity was hypertension/diabetes 22.9%. However, 12.9% had no co-morbidity. (See table 5)

Table 5: Co-morbidity pattern and obesity category

Co morbidities	Obesity class 1 n(%)	Obesity class 2 n(%)	Obesity class 3 n(%)	Total n(%)
None	59(5)	52(4.4)	41(3.5)	152(12.9)
One morbidity				
Diabetes	154(13.1)	83(7.1)	25(2.1)	**262(22.3)**
Hypertension	56(4.8)	50(4.3)	59(5)	165(14.1)
Dyslipidemia	56(4.8)	23(2)	13(1.1)	92(7.8)
Arthritis	2(0.2)	10(0.9)	6(0.5)	18(1.5)
Renal	6(0.5)	0	1(0.1)	7(0.6)
Total				696(59.2)
Two morbidity				
Hypertension/diabetes	157(13.4)	75(6.4)	37(3.2)	**269(22.9)**
Hypertension/dyslipidemia	63(5.4)	23(2)	14(1.2)	100(8.5)
Hypertension/arthritis	0	2(0.2)	2(0.2)	4(0.3)
Hypertension/renal	5(0.4)	0	1(0.1)	6(0.5)
Diabetes/dyslipidemia	11(0.9)	3(0.3)	2(0.2)	16(1.4)
Diabetes/renal	1(0.1)	1(0.1)	1(0.1)	3(0.3)
Total				379(33.9)
Three morbidity				
Hypertension/dyslipidemia/diabetes	18(1.5)	9(0.8)	5(0.4)	32(2.7)
Hypertension/dyslipidemia/arthritis	1(0.1)	0	0	1(0.1)
Hypertension/diabetes/renal	2(0.2)	1(0.1)	0	3(0.3)
Total				36(3.1)
Other	22(1.9)	11(0.9)	1(0.9)	43(3.7)

Discussion

This study recorded an obesity prevalence of 36.16%. This is higher than the prevalence reported in some studies carried out in a general out-patient clinic (12, 13, 14) and lower than the prevalence reported by Olebu et al. in a study among type 2 diabetes in a diabetic clinic at a Tertiary Healthcare Center in Eastern Nigeria, where the prevalence rate was 56.4% (15) and 74% reported from a study among diabetic

patients attending Teaching Hospitals in Lagos Nigeria (16). Patients who were employed with either semi-skilled or skilled jobs had higher obesity across the three classes of obesity with class 1 obesity being the most common among the patients. This distribution may be because individuals in this category have little or no education and they may see obesity as a desirable trait. Although this perception is common to Nigerians irrespective of the level of education, it is more acceptable among individuals with little or no education (17).

Obesity was significantly associated with gender ($p<0.05$). It was higher among females than males. Gender disparity among males and females has been consistently reported by other studies stating obesity to be prominent among females than males (18, 19, 20). Studies by Adebayo et al. (21) and Sagna et al. (22) reported obesity to be higher among older women and increased along age gradient peaking in the 51-60 years group, which is consistent with the finding in this study as obesity was significantly associated with age ($p<0.05$), with the highest prevalence among the age group 51-60 years. This high prevalence may be attributed to short intervals between pregnancies, hormonal imbalance related to menopause, use of oral contraceptive pills, dietary habits, and sedentary lifestyle (15).

Co-morbidities were grouped into one, two, and three morbidities respectively. The most prevalent single comorbidity was diabetes 22.3% while the most prevalent double comorbidity was hypertension/diabetes 22.9%. However, studies by Idung et al. (20) and Ikwudinma (13) reported dyslipidemia as the dominant co-morbidity while Lloh et al. (14) reported hypertension as the most common co-morbidity. These studies were carried out in the south-eastern part of Nigeria; therefore, more studies across the different geopolitical zones in Nigeria are needed to ascertain the dominant co-morbidity in the various zones and the reason for the differences in dominant co-morbidities among people with obesity in the country.

The prevalence of some co-morbidity increased with increasing BMI; the proportion of patients with hypertension rose with increasing obesity category. The prevalence of hypertension within obesity categories increased from 4.3% of the obesity class 2 category to 5% in obesity class 3 category and arthritis increased from 0.2% in obesity class 1 category to 0.9% in obesity class 2 category. Co-morbidities were higher among patients in the obesity class 1 category which is consistent with studies by Lloh et al. (14) and Adeloye et al. (19). Patients in the obesity class 1 category also had a higher prevalence of double and triple comorbidities.

Limitations of the study

All respondents were identified from a single affiliation, and they were all seeking health care services thus possibly were not representative of the broader southwestern population. Pre-existing data were used in this study, which is subject to numerous biases, and biochemical parameters (e.g., lipid profile) were not added to determine the presence of co-morbidities.

Conclusion

The prevalence of obesity amongst the patients was high, with obesity class 1 been the commonest among the patients. Diabetes and hypertension were the dominant co-morbidities among the patients. This finding calls for a critical look into strategies to combat these diseases in terms of prevention and management as the prevalence of obesity, diabetes, hypertension and other associated diseases keep increasing comparing the past and present reports of the prevalence of these diseases in the country.

Intervention should focus on educating the public on healthy eating and screening for obesity. There is an urgent need for hospitals to integrate screening for obesity and its co-morbidities as a baseline assessment in clinics to facilitate early detection and appropriate management. Also, there is the need for properly trained professionals who can lead and educate the public on obesity.

List of abbreviations

WHO: World health organization
BMI: Body mass index

Declarations

Ethics consideration

Approval to carry out the research was obtained from the department. Patients' information such as names and file numbers were excluded from the record.

Consent for publication

Availability of data and materials

All data generated or analyzed in this study are available upon reasonable request to the corresponding author.

Competing interest
The authors declare no conflict of interest

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Authors' contributions
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