

# Obesity in Southern Nigeria: A Prevalence Study Among Adults in Rumuomasi, Port Harcourt, Rivers State, Nigeria

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**Abstract:** Background: Obesity is progressively taking on the characteristics of an epidemic, and Nigeria has its own share from this trend. Obesity increases the risk of a number of illnesses, including type 2 diabetes mellitus, stroke, coronary heart disease, and other atherosclerotic cardiovascular diseases. This study is aimed at determining and discussing the prevalence of obesity among adults 18–87 years in Rumuomasi community, Port Harcourt, Rivers State, Nigeria. Methods: A total of 199 adults between 18 and 87 years of age participated in this cross-sectional community based study using convenience sampling. Anthropometric variables were obtained and Body Mass Index (BMI) categorized according to World Health Organization (WHO) classification. Data was analyzed by descriptive and inferential analysis using Excel and STATA version 15.0. Results: The mean age for the participants was  $49.43 \pm 15.67$  years. There were more women (68.34%) than men (31.66%). The prevalence of obesity was 24.63% and there were more obese women (30.15%) than men (12.70%) in the population. The prevalence of overweight was also at 24.62%. Age ( $P=0.013$ ) significantly influenced obesity as obesity was more prevalent in participant within 41-60 years old. Conclusion: The prevalence of obesity in this study was high (24.63%), this shows the need for regular community health education, awareness on healthy lifestyles, and regular health screening to control the rising prevalence of obesity.

**Keywords:** Obesity, Overweight, Prevalence, Southern Nigerian, Community

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## 1. Introduction

Obesity and obesity-related diseases continue to rise in the world. According to data from the World Health Organization (WHO), the number of overweight and obese people almost tripled between 1975 and 2016 [1]. Globally, obesity is progressively taking on the characteristics of an epidemic, and Nigeria is not exempted from this trend. [2–4] The current obesity epidemic has been linked to Nigeria's socioeconomic and epidemiological shift from a lower-income to a middle-income nation, which has changed eating habits and lifestyle choices. Because of this, a large number of Nigerians have sedentary lifestyles and consume diets high

in calories, resulting in excessive energy intake and poor energy expenditure in the majority of adult Nigerians. [3, 5]

As of 2016, the World Health Organization estimated that 1.9 billion people worldwide were overweight and 650 million were obese. Globally, 39% of adults aged 18 years and over were overweight in 2016, and 13% were obese. [1] According to data from the World Health Organization's Global InfoBase, between 2002 and 2010, the percentage of overweight and obese Nigerians increased by 23% for men and 18% for women, and by 49% for males and 39% for women. [4, 5] In 1990, the prevalence of overweight in West Africa was 2.6% and in 2015 it has a percentage increase of 75% (4.55%) in the last 25 years. In 2010, obesity (BMI  $\geq 30$

kg/m<sup>2</sup>), had a prevalence of 3% in men and 8.1% in women. [6] Numerous research have reported on the prevalence of obesity in Nigeria. For example, survey conducted in Lagos, South-West, Nigeria, reported that 22.20% of people there were obese, [7] while another study conducted in Ilorin, North Central Nigeria, found that 35.10% of people were overweight. [8] Additionally, more studies found that 8.10% of people in Maiduguri, North East Nigeria, were obese [9], 5.50% in Issele-Uku, Delta State, South South, were obese [5] while a study in Amadi-ama and Fimie communities in Port Harcourt reported a prevalence of 29.0% for central obesity. [10]

Obesity increases the risk of a number of illnesses, including type 2 diabetes mellitus, osteoarthritis, gallstones, fatty liver disease, stress incontinence, irregular menstruation (amenorrhea and menorrhagia), stroke, coronary heart disease, and other atherosclerotic cardiovascular diseases. [10–12] However, many adults in developing nations believe that obesity and being overweight are exclusively problems in the developed world, despite the obvious risks connected with being obese. [4] There is also this misconception among Nigerians that a high body mass index indicates wealth and a good quality of life for an individual, therefore encouraging the neglect on obesity which has been shown to be on the increase in both urban and semi-urban areas. [5, 13, 14]

It is important to understand the prevalence of overweight and obesity in Nigeria in order to address the dangerous repercussions of being overweight or obese in the nation. There are now several publications on obesity and overweight in Nigeria; [5, 7, 8, 12] however not much has been done in Port Harcourt, South South, Nigeria. Therefore, this study was carried out at Rumuomasi a semi-urban community in Port Harcourt to assess the prevalence of obesity among adults 18–87 years and to determine its prevalence among different age groups and gender.

## 2. Materials and Methods

This study was carried out at Rumuomasi, a semi-urban community in Port Harcourt, Obio/Akpor Local Government Area of Rivers State, south-south Nigeria, were recruited into this study, which was carried out a part of the World Diabetes Day. The dominant occupation and economic activities of the people of the community centered on trading, artisanship, school administration, teaching, oil and gas industries, agriculture and fisheries. [15]

A total of 199 adults between 18 and 87 years of age participated in this cross-sectional study using a convenience sampling method. The permission of the traditional ruler of the community was sought and publicity was made through the church and town criers. The participants' data were collected after mobilization and anthropometric variables were measured. The ages of each participant was determined by simply asking them of their approximate age. The international classification of adult overweight and obesity according to body mass index (BMI) adapted from the WHO [16] was used to define overweight and obesity. Weight was

measured in kilograms with a weighing scale, with subjects standing, arms hanging naturally by the sides, and footwear off. Height was measured using a stadiometer in meters at the crown of the head without any footwear or headgear and the patient looking straight ahead.

Using the WHO classification, [16] BMI was categorized as follows:

1. underweight = < 18.5 kg/m<sup>2</sup>
2. normal = ≥18.5–24.9 kg/m<sup>2</sup>
3. overweight = 25–29.9 kg/m<sup>2</sup>
4. class I obesity = 30–34.9 kg/m<sup>2</sup>
5. class II obesity = 35–39.9 kg/m<sup>2</sup>
6. class III (commonly called severe or morbid obesity) = ≥40 kg/m<sup>2</sup>

Data generated was analyzed using descriptive and inferential statistics. All data analysis was performed using MS Excel 2016 and STATA version 15.0. Chi-square test was used to determine the association between Body Mass Index and sex and age group with level of significance set at  $P < .05$ .

## 3. Results

One hundred and ninety nine (199) subjects participated in the screening exercise. There were 136 (68.34%) female and 63 male subjects (31.66%). The mean age for the participants was  $49.43 \pm 15.67$  years for males and  $48.11 \pm 13.71$  years for females. Mean age overall was  $48.5 \pm 14.33$  years. The age distribution of the respondents had a majority of 51.26% within 41–60 years age range, 27.64% of the participant were in the 18–40 years range while the least (21.10%) were above 60 years (Tables 1 and 2), age range was 18 to 87 years. Tables 1 and 2 show summary of the anthropometric characteristics of the study population.

The prevalence of obesity in this study was 24.62% (49 of 199). The prevalence of overweight was 24.62% ( $n=49$ ) while underweight was 12.06% ( $n=24$ ). Of the obese subjects, 69.39% had class I, 22.49% class II and 8.16% class III obesity (Table 4). Eight (12.7%) male subjects were obese (class I), while 41 (30.15%) female subjects were obese (19.12% - class I, 8.09% - class 2, 2.94% - class 3) (Figure 1).

Figure 2 shows the prevalence of obesity and overweight by age groups. Prevalence of obesity was highest in the 41–60 age group followed by 18–40 age group. Overweight was also highest in 41–60 age group, next to it was >60 age group. The prevalence of obesity increased with age up to age 41–60 years, after which it began to decline ( $P$ -value= 0.013). The result generally show that obesity is more prevalent in females 41–60 years old (Table 5) than in males of the same age group.

**Table 1.** Demographic characteristics of participants.

Characteristic	Number	Percentage
<i>Sex</i>		
Male	63	31.66
Female	136	68.34
<i>Age (years)</i>		
18–40	55	27.64
41–60	102	51.26
>60	42	21.10

**Table 2.** Mean height, weight and BMI by gender of participants.

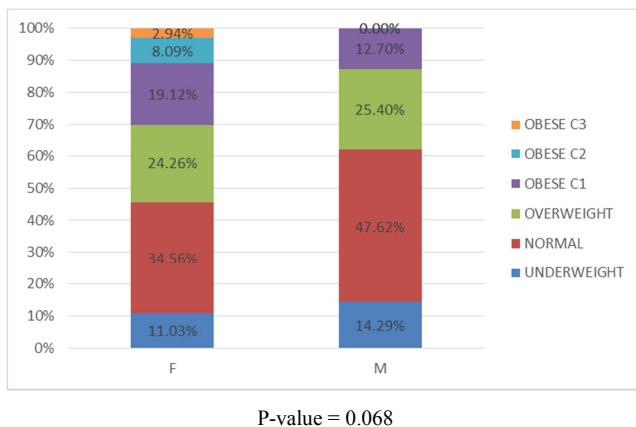
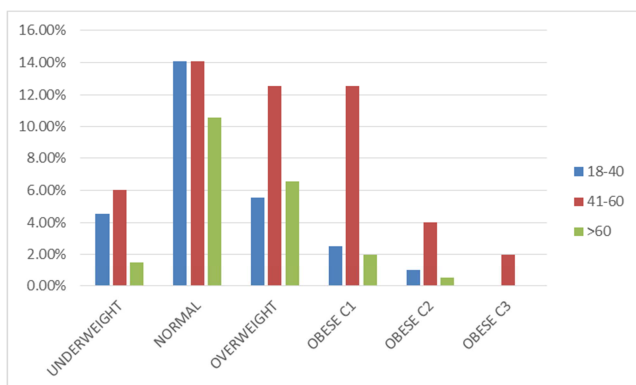
	Male (mean ±SD) (n=63)	Female (mean ±SD) (n=136)	Total (mean ±SD) (n=199)
Age (years)	49.43 ±15.67	48.11 ±13.71	48.5 ± 14.33
Height (cm)	165.8 ±6.24	167.67 ±125.75	167.08 ±103.43
Weight (Kg)	67.46 ±16.63	68.43 ±17.04	68.12 ±16.87
BMI (kg/m <sup>2</sup> )	23.98 ±4.48	27.29 ±6.01	26.22 ±5.77

**Table 3.** BMI classification of the participants.

BMI Grouping	Participants	Percentage
Underweight	24	12.06
Normal	77	38.69
Overweight	49	24.62
Obesity		
Obese Class 1	34	17.09
Obese Class 2	11	5.53
Obese Class 3	4	2.01
Total obese	49	24.63

**Table 4.** Prevalence of obesity by class.

Obesity class	Number	Percentage
Class 1	34	69.39
Class 2	11	22.45
Class 3	4	8.16
Total	49	100

**Figure 1.** Prevalence of obesity by sex.**Figure 2.** Prevalence of obesity by age group.

P-value = 0.013\*

\*statistically significant

**Table 5.** Sex- and Age-adjusted prevalence of the obese population.

	Male (%)	Female (%)	Total (%)
18 – 40	2 (4.08)	5 (10.20)	7 (14.28)
41 – 60	6 (12.25)	31 (63.27)	37 (75.52)
>60	0 (0)	5 (10.20)	5 (10.20)
Total	8 (16.33)	41 (83.67)	49 (100)

Total obese = 49

## 4. Discussion

In both developed and developing nations, the prevalence of overweight and obesity is rising at a startling rate. [6, 14, 17] About a quarter, approximately 24.6% of the participants in this study were obese with majority of the obese people being female. Such a result may be said to be due to the fact that Port Harcourt is an urban area and that people are adopting western foods and lifestyles, also pregnancy associated weight gain due to inadequate postpartum exercise may be the cause of higher prevalence of obesity in the female.

This study shows a slightly lower prevalence compared to a rural community in Port Harcourt. [10] The prevalence in this study is similar to the prevalence in Nigeria that ranged between 8.1%–22.2% [12] and that of 22.2% in an urban community in Lagos State, South West Nigeria [7] but much higher than the prevalence in Iselle-Uku, Delta State and Maiduguri, Borno State, South-South and North-East, Nigeria, respectively. [5, 9] In Nigeria, the prevalence of overweight range from 20.3%–35.1% [10] and the pooled crude prevalence at 25.0%. [17] In this study approximately 24.6% were overweight which similar to that for Nigeria as a whole [12] and a bit lower than in Benue State North-Central, Nigeria [14].

With 12 million obese people and roughly 21 million overweight people in Nigeria in 2020, Nigeria may be the most afflicted nation in Africa. [17, 18] Furthermore, there is a trend towards employment that require less physical exertion and a rise in the popularity of sedentary jobs. Insufficient intake of the traditional African diet, which is high in fruits and vegetables, and excessive consumption of energy-dense foods prepared in the Western way. This results in the most frequent components of metabolic syndrome—obesity, hyperglycemia, and hypertension—as well as the subsequent emergence of additional symptoms. [10, 19] In 2011, it was reported that changes in behavioral patterns, such as a more sedentary lifestyle and diet and a Western diet, as well as the urban environment could be responsible for the higher prevalence of overweight and obesity. [7]

This study found that females were more obese than males, although this was not statistically significant (P=0.068). This finding was similar to previous studies but had a significant relationship with BMI. [10, 20, 21] However, findings from the AusDiab study showed that men had higher BMIs than women. [19] 30.15% of females in this study were obese while 12.7% of males were obese. Though females were more in this study with female being 68.34% and males being 31.66%, but a similar study where males were more,

with 62.0% and 38.0% of the participants being males and females, respectively, found that 2.4% of males and 7.4% of females were obese. [8] One of the possible causes of the high incidence of obesity among women in some studies are their high rate of physical inactivity due to cultural practices. Physical inactivity had the strongest association with obesity measurements, according to studies on the relationship between obesity measures and factors in African women. [22, 23] More studies have shown that female gender, a high socioeconomic class, a sedentary lifestyle, being older than 40, and a high-energy diet are other potential risk factors for overweight and obesity, [7, 9, 24] of which our study showed that the age group with the highest prevalence of obesity was between 41- 60 years. Also studies on obesity in low and middle income countries, which Nigeria is one of them, reported that a number of factors may contribute to the higher rate of obesity among women compared to men, such as physiological responses to early-life nutrition that differ depending on the gender, pregnancy-associated weight gain coupled with higher parity, [25] hormonal signaling related to energy expenditure, [26] physical activity levels, [27] depression, [28] and sociocultural factors like the idea of an ideal body size and attitudes regarding the acceptability of physical activity in certain contexts. The rising rate of obesity among women in reproductive age in low and middle income countries may have significant cross-generational ramifications since maternal obesity is a risk factor for pediatric obesity. [27]

Obesity and overweight were highest in 41-60 age group with majority being class 1 obese, showing that age significantly influences the prevalence of obesity ( $P$ -value=0.013). This is similar to the findings in an earlier study on prevalence of obesity among Nigerian adults where the highest prevalence was obtained in the age range 40–49 years. [12] The high prevalence in this age group can be as a result of the fact that majority of the working population are in this age group.

## 5. Limitations of the Study

Few number of participants and inadequate information on the predisposing factors for obesity in this population.

## 6. Conclusion

Obesity increases the risk of a number of illnesses and many adults in developing nations believe that obesity and being overweight are exclusively problems in the developed world, despite the obvious risks connected with being obese. Nigerians believe that a high BMI indicates wealth and a good quality of life encourages the neglect on obesity and therefore increases its risk in both urban and semi-urban areas. The prevalence of obesity and overweight in this study was 24.6% respectively, indicating a trend towards increased prevalence. Women are more obese in this population with Class 1 obesity being the most common obesity pattern, and obesity increased across the age gradient, peaking in the 41

to 60-year age-group in both men and women. There is a need for regular community education on healthy lifestyles, and regular health screening to control the rising prevalence of obesity, as well as to prevent or reduce the risk of obesity comorbidities in this community. The effect of other predisposing factors should be researched on in this population.

## Abbreviations

WHO: World Health Organization

BMI: Body Mass Index

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## Conflicts of Interest

The authors declare no conflicts of interest.

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