Prevalence of Overweight and Obesity in Selected Semiurban Communities in Delta State Nigeria

Umuerri EM[1], Umuago IJ[2], Omo-Aghoja VW[3], Agbatutu EA[2]*

Abstract

Introduction: There is an on-going epidemiological transition in present-day developing countries, like Nigeria, with the adoption of western civilization and lifestyle. This has been implicated as a contributory factor to the rising scourge of obesity and overweight.

Materials & Methods: This was a cross-sectional survey of 886 adult participants drawn from six selected semi-urban communities in Delta State at the free health promotion program organized by Seplat Petroleum Development Company Nigeria Limited in collaboration with the Medical Women's Association of Nigeria (MWAN), Delta State branch between March and April 2012. Secondary data obtained from participants which included their age, sex, weight, height and the calculated body mass index (BMI, obtained by dividing the weight (kg) by the square of the height in metres^2) were analysed.

Results: A total of 886 participants were recruited with their age ranging between 18 - 100 years. There were 293 (33.1%) males and 593 (66.9%) females. The mean (± standard error of mean) age and body mass index was 48.9 (±0.50) years and 25.8 (±0.20)kg/m^2 respectively. The prevalence of obesity and overweight were 23.1% and 26.1% respectively. The prevalence of obesity was statistically significantly higher among females (χ^2= 37.554, p <0.001) and this peaked in those within the age-group of 45-54years (χ^2= 84.388, df = 18, p <0.001).

Conclusion: Obesity and overweight are common with about half of the study population having a BMI >25.0kg/m^2. Concerted efforts should be made to promote healthy lifestyle in these communities.

Key words: *Obesity, overweight, semi-urban, adults*

[1] *Department of Medicine, Delta State University, Abraka, Nigeria / Delta State University Teaching Hospital, Oghara, Nigeria*
[2] *Department of Community Medicine, Delta State University Teaching Hospital, Oghara, Nigeria*
[3] *Department of Maxillofacial Surgery, Central Hospital, Sapele, Nigeria*

[*]**Correspondence:** *Ejiroghene Martha Umuerri, Department of Medicine, Delta State University, P.M.B 07, Oghara, Nigeria. Mobile Phone: +234 803 348 7741, e-mail: umuerriejiro@gmail.com*

Introduction

Obesity and overweight represents a state of excess storage of body fat that presents a risk to health commonly due to an imbalance between calories in-take and expenditure[1]. A widely used method of assessing body fat is by calculating the body mass index (BMI) which is a measure of weight relative to height, or the Quetelet index[2]. Although BMI does not measure body fat directly it has been shown to correlate to direct measures of body fat such as underwater weighing and dual energy x-ray absorptiometry

(DXA)[3]. The World Health Organization (WHO), defines obesity and overweight as BMI of $\geqslant 30kg/m^2$ and $25.0 - 29.9kg/m^2$ respectively[4].

Obesity and overweight are increasingly becoming a global public health challenge. The worldwide prevalence of obesity has nearly doubled between 1980 and 2008[5]. In 2008, 10% of men and 14% of women in the world were obese (BMI $\geqslant$ 30 kg/m2), compared with 5% for men and 8% for women in 1980. An estimated 205 million men and 297 million women over the age of 20 were obese – a total of more than half a billion adults worldwide[6].

Raised body mass index ($\geqslant 25kg/m^2$) is **associated with multiple adverse health conditions with increased morbidity and mortality.** Worldwide, at least 2.8 million people die each year as a result of being overweight or obese, and an estimated 35.8 million (2.3%) of global disability-adjusted life-years (DALYs), which is the sum of years of life lost from premature deaths and years lived with disability are caused by overweight or obesity[7]. Overweight and obesity lead to adverse metabolic effects on blood pressure, cholesterol, triglycerides and insulin resistance. It is a modifiable risk factor for cardiovascular diseases and diabetes mellitus. It also increases the risk of cancer of the breast, colon, prostate, endometrium, kidney and gall bladder. Mortality rates increase with increasing degrees of overweight, as measured by body mass index.

As with other forms of non-communicable disease, obesity has been described as a lifestyle disease, being predominant when a western lifestyle is adopted. Once considered a problem only in high income countries, overweight and obesity are now dramatically on the rise in low- and middle-income countries. Yet there is paucity of reports in the literature on obesity and its correlates in our setting in Delta State, especially the risk factors for its occurrence. As a first step towards filling this gap, we decided to embark on this study to determine the prevalence of obesity and overweight among free-living adults in selected semi-urban communities in Delta State, Nigeria. We believe that this report has the potential to stimulate further studies to document the critical socio-epidemiological risk factors for obesity and overweight with a view to using them to design appropriate interventions that will mitigate the burden of obesity in Nigeria.

Materials and method

In this cross-sectional study, secondary data were obtained from records of adults aged 18years and above who participated in a free health promotion program organized by Seplat Petroleum Development Company, Nigeria Limited in collaboration with Medical Women's Association of Nigeria (MWAN), Delta State branch in selected semi-urban communities in Delta State (Amukpe, Okirigwe, Ovo (Jetty), Jesse, Mosogar and Ugboren) between March and April 2012 as part of their corporate social responsibility. Pregnant women were not included in this screening program as a separate exercise tagged 'Safe Motherhood' had been organized to cater for this category of inhabitants in these selected communities. As part of the program, participants had their weight and height measured and recorded to the nearest 0.1kg and 0.01m respectively.

Participants with complete secondary data which included age, sex, weight and height were recruited into the study, while those with incomplete data or with any one of the above listed parameters missing were excluded.

The BMI was calculated as weight in kilograms divided by the square of the height in metres[2].

Definitions- BMI Category based on WHO definition[4]:

1. $<18.5 kg/m^2$ = Underweight
2. $18.5 - 24.9 kg/m^2$ = Normal
3. $25.0 - 29.9 kg/m^2$ = Overweight
4. $\geqslant 30.0 kg/m^2$ = Obese

The data obtained was checked for completeness before entering into Microsoft Excel (97-2003) spreadsheet from where it was exported to the Statistical Package for Social Sciences (SPSS) version 16 software for analysis and calculation of the prevalence of overweight and obesity.

The chi square test was used to test the association between categorical variables. Percentages, means and standard deviation was used to summarize numerical variables.

The level of statistical significance is set at $p < 0.05$.

Results

Data from eight hundred and eighty six (886) subjects met the study criteria and were included in this study. There were 293 (33.1%) males and 593 (66.9%) females, with a male to female ratio of 1:2. The age range of the study population was 18 to 100 years, with a median age of 50 years. There was no statistically significant difference between the age groups and sex of participants ($\chi^2 = 6.195$, df = 6, p= 0.402) as shown in figure 1.

The difference in the means of the clinical characteristics of the study population are presented in table 1. The difference in the BMI between male and female subjects was statistically significant (t-value = -4.581 at CI of -2.75 to -1.10).

The overall prevalence of obesity and overweight was 23.1% and 26.1% respectively. The difference between the prevalence of obesity by sex was statistically significant ($\chi^2 = 37.554$ p <0.001) as shown in table 2.

The prevalence of obesity and overweight was highest in those in the age bracket of 45-54 years being 38.0% and 26.8% respectively. This was closely followed by those in the age group of 55-64 years with the prevalence being 21.2% and 24.9% respectively; and, 25.1% and 22.0% respectively in those in the age bracket of 35-44 years. The difference between age group and BMI category was statistically significant (p <0.001) as shown in table 3.

Figure 1: Distribution of study population by age group and sex

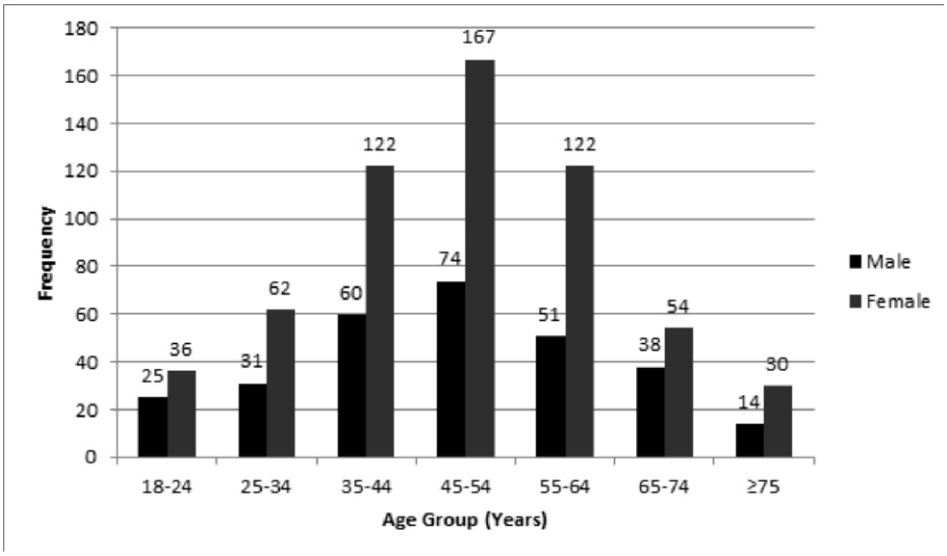

Table: 1 Clinical Characteristics of Study Population

Mean Variable ± SEM	Total (n=886)	Male (n=293)	Female (n=593)	t-value	95% CI	p-value
Age (years)	48.9 ± 0.50	48.7 ± 0.92	49.0 ±0.60	0.206	-1.883 to 2.324	0.837
BMI (kg/m²)	25.8 ± 0.20	24.5 ± 0.26	26.5 ± 0.27	4.581	1.101 to 1.192	<0.001*
SBP (mmHg)	133.5 ± 0.83	135.5 ± 1.37	132.5 ± 1.04	-1.702	-6.506 to 0.463	0.089
DBP (mmHg)	81.5 ± 0.47	82.5 ± 0.83	81.1 ± 0.58	-1.404	-3.401 to 0.565	0.161

Table 2: *Prevalence of obesity and overweight by sex*

SEX	Frequency	BMI CATEGORY			
		Underweight	**Normal Weight**	**Overweight**	**Obesity**
Male	293 (33.1%)	17 (5.8%)	155 (52.9 %)	89 (30.4%)	32 (10.9%)
Female	593 (66.9%)	35 (5.9%)	243 (41.0%)	142 (23.9%)	173 (29.2%)

χ^2= 37.554 p <0.001

Table Prevalence of obesity and overweight by age group

Age Group (Years)	Frequency	BMI CATEGORY			
		Underweight	Normal Weight	Overweight	Obesity
18-24	61 (6.9%)	5 (9.6%)	47 11.8%)	9 (3.9%)	0 (0.0%)
25-34	93 (10.5%)	4 (7.7%)	50 (12.6%)	28 (12.1%)	11 (5.4%)
35-44	182 (20.5%)	10 (19.2%)	69 (17.3%)	58 (25.1%)`	45 (22.0%)
45-54	241 (27.2%)	12 (23.1%)	89 (22.4%)	62 (26.8%)	78 (30.8%)
55-64	173 (19.5%)	9 (17.3%)	64 (16.1%)	49 (21.2%)	51 (24.9%)
65-74	92 (10.4%)	5 (9.6%)	53 (13.3%)	17 (7.4%)	17 (8.3%)
≥ 7 5	44 (5.0%)	7 (13.5%)	26 (6.5%)	8 (3.5%)	3 (1.5%)

χ^2= 84.388, df = 18, p <0.001

Discussion

The prevalence of obesity and overweight is high in this study. About half of the study population (49.2%) have a raised BMI being either overweight or obese. Chukwuonye et al[8] in a systematic review of adult Nigerians using BMI as the tool for assessing body fat, showed that the prevalence of obesity and overweight ranged between 8.1% -22.2% and 20.3% - 35.1% respectively. Although, the prevalence of obesity of 22.2% obtained in that review[9] is similar to the 23.1% in this study, the settings were

different: urban setting (Lagos) compared with the semi-urban setting in these communities. On the other hand, the prevalence of obesity was 8.1% in a study of suburban population in Northern Nigeria (Markafi and Giwa) by Bakari et al[10]. These differences may be attributed to dissimilar socio-cultural background. Varying degrees/rate of urbanization of rural and sub-urban communities may also be contributory. A study[11] of indigenous residents of Kalabari kingdom in South-South Nigeria revealed a high prevalence of obesity (49.34%) and the influence of occupation, diet and socio-cultural lifestyle were suggested as contributory factors. Although this study did not assess socio-cultural and economic status, eating energy-dense food such as those prepared from processed cassava (*Eba, Starch*) and palm-oil based soup (*Oghwo, Banga soup*), adoption of sedentary lifestyle and less physically active jobs as well as reduced physical activity enhanced by the frequent use of modern means of transportation such as motor-bikes and tricycles readily available in these localities are hypothesized as contributory factors to the high prevalence of obesity and overweight.

In this study the prevalence of obesity in females subjects was three times more than males. Other studies in Nigeria[10-14] and around the world[6] also show that the prevalence of obesity in females was more than males.

Majority of subjects who were obese or overweight were middle-aged (45-64 years). It is however worrisome that 25.1% and 22.0% of subjects aged between 35-44 years were overweight and obese respectively. This high prevalence rate would imply clinical manifestations viz-a-viz premature mortality and morbidity as commonly seen even among the young adult population, further bringing to fore the enormity of the public health challenge posed by overweight and obesity.

Conclusion

This study showed that the prevalence of obesity and overweight is high in the sub-urban communities studied, especially among women. Although middle-aged subjects were most affected, the young adult subjects were not spared of this scourge. We recommend that there is a compelling need for further studies that will clearly document the socio-epidemiological risk factors for obesity and overweight in these communities. However it is suggested that Government and non-governmental organizations should make concerted efforts aimed at reversing the high prevalence and encourage individuals to adopt a more appropriate healthy lifestyle choices.

References

1. World Health Organization. Obesity: Preventing and managing the global epidemic. Report of a WHO Consultation (WHO Technical Report Series 894). World Health Organization, 2010 .
2. Garrow JS, Webster J. Quetelet's index (W/H2) as a measure of fatness. Int J Obes. 1985;9:147-153
3. Prentice AM, Jebb SA. Beyond Body Mass Index. Obesity Reviews. 2001;2:141-147
4. World Health Organization. Obesity: Preventing and managing the global epidemic. Report of the WHO consultation on obesity. Geneva: World Health Organization, 1998.
5. Stevens GA, Singh GM, Lu Y, Danaei G, Lin JK, Finucane MM, Bahalim AN, et al. National, regional and global trends in adult overweight and obesity prevalences. Popul Health Metr. 2012;10:22
6. Finucane MM, Stevens GA, Cowan MJ, Danaei G, Lin JK, Paciorek CJ, et al. National, regional and global trends in body

mass index since 1980: systematic analysis of health examination surveys and epidemiological studies with 960 country-years and 9.1 million participants. Lancet. 2011;377:557-567

7. World Health Organization. Global health risks: mortality and burden of disease attributable to selected major risks. Geneva, World Health Organization, 2009.
8. Chukwuonye II, Chuku A, John C, Ohagwu KA, Imoh ME, Ogah OS, Oviasu E. Prevalence of overweight and obesity in adult Nigerians – a systematic review. Diabetes, Metabolic Syndrome and Obesity: Targets and Therapy 2013:6 43–47
9. Amira CO, Sokunbi DOB, Dolapo D, Sokunbi A. Prevalence of obesity, overweight and proteinuria in an urban community in South West Nigeria. *Nigerian Medical Journal*. 2011;52(2):110–113.
10. Bakari AG, Onyemelukwe GC, Sani BG, Aliyu IS, Hassan SS, Aliyu TM. Obesity, overweight and under-weight in suburban Northern Nigeria. *Int J Diabetes & Metabolism*. 2007;15:68–69.
11. Adienbo OM, Hart VO, Oyeyemi WA. High Prevalence of Obesity among Indigenous Residents of a Nigerian Ethnic Group: The Kalabaris in the Niger Delta Region of South-South Nigeria. Greener Journal of Medical Sciences. 2012;2(6):152-156
12. Bakari AG, Onyemelukwe GC. Indices of obesity among type-2 diabetic Hausa-Fulani Nigerians. Int J Diab Metab 2005; 13: 28-29.
13. Desalu OO, Salami AK, Oluboyo PO, Olarinoye JK. Prevalence and socio-demographic determinants of obesity among adults in an urban Nigerian population. *Sahel Medical Journal*. 2008;11(2):61–64.
14. Adedoyin RA, Mbada CE, Balogun MO, Adebayo RA, Martins T, Ismail S. Obesity prevalence in adult residents of Ile-Ife, Nigeria. *Nig Q J Hosp Med*. 2009;19(2):100–105.

Acknowledgement: We wish to thank Seplat Petroleum Development Company, Nigeria Ltd. and Medical Women's Association of Nigeria, Delta State branch for providing us with the data.

Citation

This article should be cited as: "*Umuerri EM, Umuago IJ, Omo-Aghoja VW, Agbatutu EA*. Prevalence Of Overweight And Obesity In Selected Semiurban Communities In Delta State Nigeria. Afr. J. Trop. Med. & Biomed. Res 2013; 2 (2): 69-74".