Prevalence of Overweight / Obesity of Adults in Warri Metropolis, Nigeria

Dominic F Essiet, Humphrey B Osadolor

Abstract: _Background: According to report from WHO the rate of obesity has increased rapidly in developing countries over the past 20years and obesity related diseases have also increased. Therefore the aim of this study is to examine the prevalence of overweight and obesity in an urbanized metropolis of a developing nation. Methods: A total of 420 apparently healthy adults (210 males and 210 females) within the age limit of 21 to 85years were selected in Warri metropolis, an Urban metropolitan city in the oil rich southern Nigeria. A BMI was conducted on each participant and prevalence of overweight and obesity were determined. Results: Prevalence of overweight and obesity in this population was 45.7% and 16.7% respectively. Prevalence of females overweight and obesity was 50.1% and 26.1% while prevalence of males overweight and obesity was 41.0% and 7.1% respectively with increase in age as a risk factor for overweight and obesity. Conclusion: More than half of the adults population was either overweight or obese with females being more obese than male. There is need for frequent monitoring of BMI and health education for control of overweight and obesity because of the associated health risks._

Keywords: Prevalence, Overweight, Obesity, Adults, Warri Metropolis, Nigeria.

1. Introduction

Obesity is a major health problem, and there is an increasing trend of overweight and obese individuals in developing countries (Olatunbosun *et al.*, 2011, Mitchell *et al.*, 2011, Chukwuonye *et al.*, 2013 and Peltzer *et al.*, 2014). Being overweight or obese is known to contribute significantly to morbidity and mortality rates in various countries around the world (Umuerri *et al.*, 2017and WHO, 2018). The rate of obesity has increased rapidly in developing countries over the past 20 years as adults rapidly become more urbanized and westernized with unhealthy lifestyle choices such as increased consumption of high calorie foods and adoption of a more sedentary lifestyle (Agofure *et al.,* 2017, Umerri *et al.,* 2017 and WHO, 2018). Because of this, obesity related diseases such as coronary heart disease, stroke, hypertension, cancers, osteoarthritis and diabetes mellitus are on the increase (Mitchell *et al.,* 2011, Rtveladze *et al.,* 2013, Chinedu *et al.,* 2013, Olamuyegun *et al.,*2016 and WHO, 2018). Warri is an urbanized metropolis and will likely be faced with the consequences of this current trend of unhealthy lifestyle choices. Different studies have been carried out in Nigeria (Adamu *et al.,* 2015, Agofure, 2017, Anyawu *et al.,* 2011, Chukwuonye *et al.,* 2013 and Umerri *et al.,* 2017) but not much has been done in the Niger Delta region of Nigeria which Warri is located. Therefore, the aim of this study is to screen Body Mass Index of adults in Warri metropolis in order to create awareness of the increasing rate of obesity in developing countries because of the associated health risks.

2. Materials and Methods

Warri is located in the Niger Delta, South-South region of Nigeria and is highly urbanized. A total of 420 adults comprising 210 males and 210 females randomly selected across Warri metropolis were recruited to participate in the study. Participants aged 21 to 85 years were recruited and classified into age groups of 10years up to 70years and 71 to 85years. Inclusion criteria were Adult males and females that were ambulant and generally of good health with no evidence of a chronic or acute illness. Exclusion criteria were adult males and females that were hospitalized, pregnant women, nursing mothers or obviously ill adults. Ethical approval was obtained from Ethics and Research Committee of Delta State Health Management Board, Warri Medical Zone, General Hospital Warri, Delta State of Nigeria. Statistical analysis was done using student t-test, ANOVA, Graph Pad prism 6 for software (La Jolla, California, USA) windows with P < 0.05 considered as statistically significant. Percentage of BMI deviating positively or negatively from reference range was calculated as prevalence. Using a standard protocol (Adamu et al. 2015), standing height was measured to the nearest 0.1 cm without shoes, using a stadiometer. Participants wearing light clothes were weighed to the nearest 0.1 kg on a load-cell-operated digital scale which was first calibrated using a standard weight and re-checked daily. Body mass index (BMI) was calculated as weight in kg divided by height in meters squared. Socio-demographic questions including age, gender, and marital status were documented and BMI was categorized using WHO BMI classification as follows: Underweight BMI $\leq 18.5 Kg/m^2$, Normal weight BMI 18.5-24.5Kg/m^2, Overweight BMI 25.0-29.9Kg/m^2, Obesity BMI $\geq 30.0 Kg/m^2$ (WHO,2018).

3. Results

Table 1 shows BMI classification of subjects according World Health organization's ranges for all categories. It shows that the prevalence of normal, overweight and obese subjects was 36.0%, 45.7%, 16.7% respectively. Table 2 shows a statistically significant difference (P=0.00) between the weight distribution of males and females. Female population was significantly more overweight and obese (P=0.00) than males (50.5% and 26.1%, 41.0% and 7.1% respectively. Table 3 and figure 1 show a statistically significant higher association (P=0.00) between overweight and age where overweight increased as age group increased from age group 31-40yrs to 71-85yrs. It also showed that prevalence of obesity increased as age group increased from 21-30years to 41-50yrs. The prevalence of overweight in the female categories decreased as age group increased from 21-30yrs to 51-60yrs. while obesity increased as age group

increased from 21-30yrs to 41-50yrs respectively (Table 4 and Figure 3). Figure 2 showed that the prevalence of males with normal weight decreased as age group increased from age group 21-30yrs to 51-60yrs while prevalence of overweight increased as age group increased in the same age group categories. Figure 3 showed that in females, normal weight decreased as age group increased from 21-30yrs to 41-50yrs while overweight decreased as age group increased from 21-30yrs to 51-60yrs. Figure 3 also showed that obesity increased as age group increased from 21-30yrs to 41-50yrs.

4. Discussion

Prevalence of Obese, overweight and underweight of 16.7%, 45.7% and 1.7% obtained from this study (table 1) according to WHO BMI classification was lower than prevalence of underweight of 3.6% and higher than overweight/obese of 43.2% obtained from a study obtained in Ibadan, Nigeria (Adebayo *et al.*,2011). Overweight of 45.7% in this study was higher than 27.7%, while obesity of 16.7% was similar to 15.2% reported in Nigeria by Chukwuonye *et al.*, (2013). Overweight in this study was higher than overweight of 23.9% and obesity was similar to obese of 15.7% in urban Warri reported by Umerri *et al.,* (2017). Overweight and Obesity in this study were higher than 39% and 13% reported by WHO, (2018). The report from this study of 62.4% (overweight/obese) was similar to 66% reported by Akarolo-Anthony *et al. (*2014) in Abuja, Nigeria. Overweight of 45.7% and obese of 16.7% in this study was higher than 38.4% and 12.5% reported in a hospital based study in Ghana (Yeboah *et al*., 2018). Report from this study that females were more overweight and obese than males (50.5%, 26.1% females against 41.0%, 7.1% males) was in tandem with Global reports in the United States (WHO, 2018), Kalra and Unnikrishnan, (2012) and a previous study in urban Warri (Umerri *et al.,* 2017) who reported that females are more overweight and obese than males. However, this study disagrees with their report that women were three times more overweight than men. In this study, the ratio of overweight of women to men was 1.7:1. This study also revealed that overweight increased with increase in age group in the population studied from 31-40yrs up to 71-85yrs, this may be due to lesser physical activity and more sedentary lifestyle in the urban areas as adults advance in age. Overweight also increased in males from age group of 21-30yrs up to 51-60yrs. Therefore it is important to have a frequent monitoring of BMI of adults as they advance in age.

5. Conclusion

This study revealed that more than fifty percent of the population was either overweight or obese and females were more overweight and obese than males. It was concluded that because of the high prevalence of overweight and obesity in this population, there is need for frequent monitoring of BMI and health education for control of overweight and obesity in the adult population because of the impending health consequences.

6. Tables and Charts

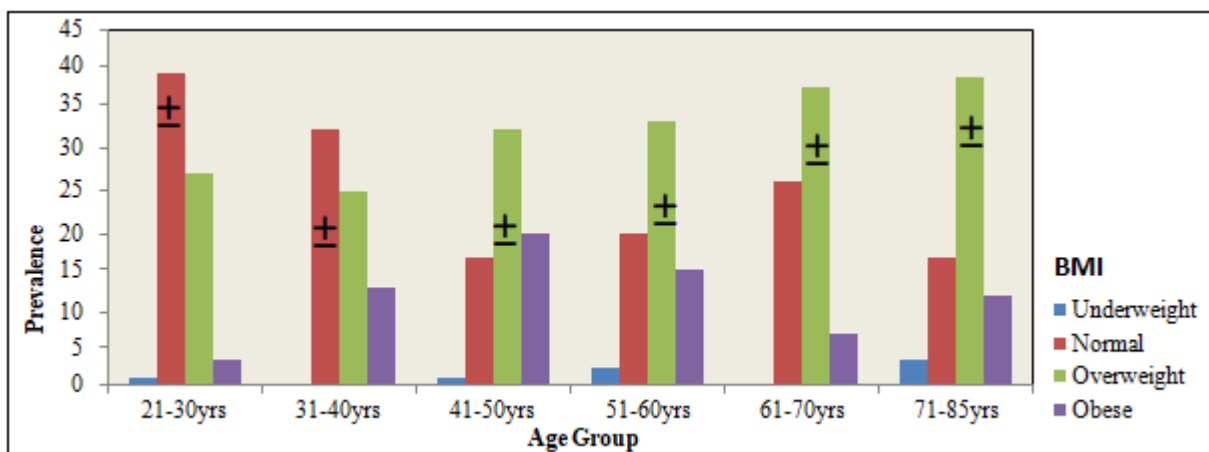**Table 1:** BMI Classification of Subjects as compared with WHO Range for all Categories

	Frequency	Percentage
Underweight	7	1.7
Normal	151	36.0
Overweight	192	45.7
Obese	70	16.7
Total	420	100.0

Table 2: Distribution of BMI Classes and the Association between Males and Females.

	Male	Female	χ^2	P
Underweight	6(2.9)	1(0.5)	48.545	0.000
Normal	103(49.0)	48(22.9)		
Overweight	86(41.0)	106(50.5)		
Obese	15(7.1)	55(26.1)		

Table 3: Association between Age and BMI in the Population studied

|	21-30yrs	31-40yrs	41-50yrs	51-60yrs	61-70yrs	71-85yrs
Underweight	1(1.4)	0(0.0)	1(1.4)	2(2.9)	0(0.0)	3(4.3)
Normal	39(55.7)	32(45.7)	17(24).3)	20(28.6)	26(37.1)	17(24.3)
Overweight	27(38.6)	25(35.7)	32(45.7)	33(47.1)	37(52.9)	38(54.3)
Obese	3(4.3)	13(18.6)	20(28.6)	15(21.4)	7(10.0)	12(17.1)
$\chi^2 = 41.326$; p=0.000						

Figure 1: Association between Age and BMI in Population studied

Table 4: Distribution of Male and Female Subjects in varying Age Groups and their BMI Classification (in frequency and percentage)

Sex	Male			Female		
	Normal	Overweight	Obese	Normal	Overweight	Obese
21 -30yrs	26(74.3)	9(25.7)	0(0.0)	14(40.0)	18(51.4)	3(8.6)
31-40yrs	22(62.3)	10(28.6)	3(8.6)	10(28.6)	15(42.9)	10(28.6)
41-50yrs	13(37.1)	17(48.6)	5(14.3)	5(14.3)5	15(42.9)	15(42.9)
51-60yrs	12(34.3)	20(57.1)	3(8.6)	10(23.6)	13(37.1)	12(34.2)
61-70yrs	21(60.0)	13(37.1)	1(2.9)	5(14.3)	24(68.6)	6(17.1)
71-85yrs	15(42.9)	17(48.6)	3(8.6)	5(14.3)	21(60.0)	9(25.7)
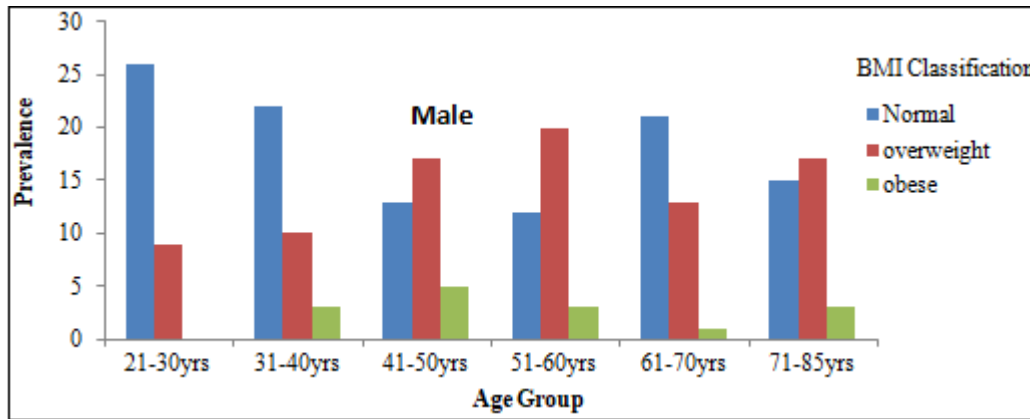
Figure 2: Distribution of BMI classification of Male Subjects in varying Age Groups
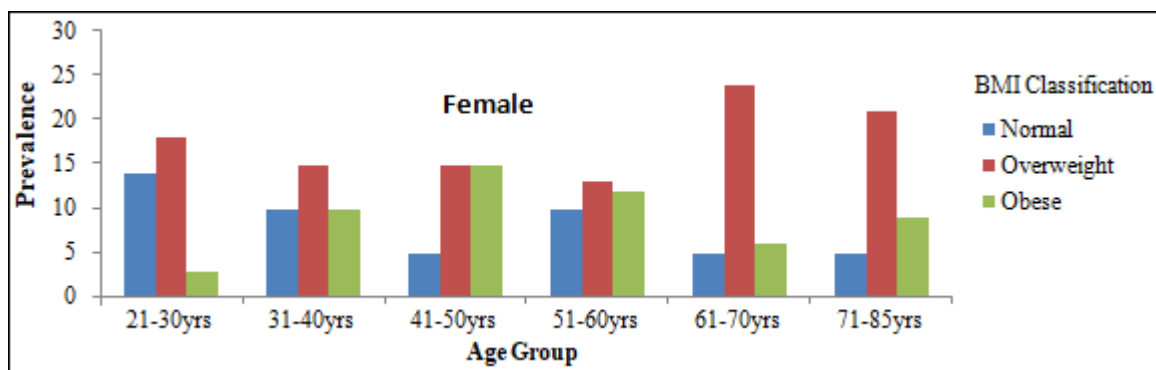
Figure 3: Distribution of BMI classification of Female Subjects in varying Age Groups

References

[1] Adebayo, A.M., Ige, O.K., Ilesanmi, O.S., Ogunniyan, T.B., and Ojo, T. (2011). Making a Case for Community Screening Services: Findings from a Medical Outreach in Ibadan, Nigeria. *Annals of Ibadan Post Graduate Medicine.* 9(1): 14–18.

[2] Akarolo-Anthony, S.N., Willett W.C., Spiegelman, D. and Adebamowo, C.A (2014) Obesity epidemic has emerged among Nigerians. *BioMed Cental Public Health* 14:455.

[3] Chinedu, S.N., Ogunlana, O.O., Azuh, D.A.E., Iweala, E.E., Afolabi, I.S., Ubegbu, C.C. (2013). Correlation between Body Mass Index and Waist Circumference in Nigerian Adults. Implication as Indicators of Health Status, *Journal of Public Health Research.* 2: 94-98.

[4] Olamoyegun , M. A., Akinlade, A. T., Fawale, M. B. and Ogbera, A. O.(2016). Dyslipidemia as a risk factor in the occurrence of stroke in Nigeria: prevalence and patterns. *The Pan African Medical Journal* 25:72.

[5] Mitchell, N.,Catenacci, V., Wyatt, H. R., Hill, J. O.(2011). OBESITY: OVERVIEW OF AN EPIDEMIC. *North American Clinical Psychiatry.*34 (4):717-732.

[6] Umerri, E. M., Ayandele, C. O. and Eze, G. U.(2017). Prevalence and sociodemographic correlates of obesity and overweight in a rural and urban community of Delta State, Nigeria. *Sahel Medical Journal.* 20: 173-178.

[7] Agofure, O. (2018). Prevalence of obesity among adults in Issele-Uku, Delta State, Nigeria. *Alexandria Journal of Medicine* 54 (4):463-468.

[8] Chukwuonye, I.I., Chuku, A., John, C., Ohagwu, KA., Imoh, M.E., Ejiji, S., Ogah, S.O., Oviasu, E. (2013). Prevalence of overweight and obesity in adult Nigerians – a systematic review. *Diabetes, Metabolic Syndrome and Obesity: Targets and Therapy* 6 : 43—47.

[9] Yeboah, (2016). Prevalence of Benign Prostate Hyperplasia and prostate Cancer in Africans and Africans in the Diaspora. Journal of West African College of Surgeons. 8 (4):1-30.

[10] Olatunbosun,S.T., Kaufman, J.S., and Bella, A. F. (2011). Prevalence of obesity and overweight in urban adult Nigerians. *Obesity reviews* 12(14): 233- 241.

[11] Peltzer, K., Pengpid., S., Samuels, T.A., Özcan, N.K., Mantilla, C., Rahamefy O.H. *et al.* (2014). Prevalence of overweight/obesity and its associated factors among university students from 22 countries. International Journal of Environmental Research and Public Health. 11(7) :7425-7441.

[12] Rtveladze, K., Marsh, T., Webber, L., Levy, D., Conde, W. (2013) Health and economic burden of obesity in Brazil. *US National Library of Medicine National Institutes of Health*. 11(7):8

[13] World Health Organization: Obesity and Overweight. World Obesity Federation (2018).