

**THE BODY MASS INDEX OF SELECTED MALE AND FEMALE ADULTS SUBJECTS  
IN YENAGOA, AND SOME RURAL AREAS OF BAYELSA STATE NIGERIA.**

<sup>1</sup>\*Solomon M. Uvoh, <sup>2</sup>Asara A. Azibalua, <sup>3</sup>Tabowei O. Churchill and <sup>4</sup>Solomon A. Lelei

<sup>1,2</sup>Department of Human Physiology, Faculty of Basic Medicine, College of Health Sciences, University of Port Harcourt, Choba, Port Harcourt, Rivers State, Nigeria.

<sup>3</sup>School of Science and Engineering, Department of Biotechnology, Teesside University Middlesbrough United Kingdom.

<sup>4</sup>Department of Human Physiology, College of Health Sciences, Niger Delta University Wilberforce Island Amassoma Bayelsa State Nigeria.

\*Corresponding Author: Solomon M. Uvoh

Department of Human Physiology, Faculty of Basic Medicine, College of Health Sciences, University of Port Harcourt, Choba, Port Harcourt, Rivers State, Nigeria.

Article Received on 25/05/2017

Article Revised on 15/06/2017

Article Accepted on 06/07/2017

**ABSTRACT**

The body mass index of some adult subjects between the ages of twenty to sixty five (20-65) years were studied in Bayelsa State. The number of subjects studied were two hundred, comprising one hundred and four males and ninety six females. The analysis from the result indicates that 2.9%,24.0%,38.5%,and 34.6% male subjects were under weight, normal, overweight, and obese while the female subjects had 2.15,32.3%,42.3%,and 22.9% as underweight, normal, overweight, and obese respectively. The overall body mass index (kg/m<sup>2</sup>) for adult male subjects between the ages of twenty to forty five and forty six to sixty five are 28.7kg/m<sup>2</sup> and 30.09kg/m<sup>2</sup> while the body mass index for the adult female subjects were 27.21kg/m<sup>2</sup> and 27.56kg/m<sup>2</sup> respectively. However, the mean value for the entire one hundred and four male subjects were 29.02kg/m<sup>2</sup> and 28.01kg/m<sup>2</sup> for the female subjects. The percentage of adult male and female subjects observed to be underweight were very low (2.9%) and (2.1%) indicating that villages in Bayelsa State are well known for Agricultural activities. We also observed a significant difference between the weight and height. It is therefore recommended that due to increase in body mass index, there is need for both Governmental and non-Governmental agencies including all health institutions in the State to embark on enlightenment campaign program on the need for regular exercise, anthropometric checkup, and sedentary life style to curb the menace of overweight and obesity.

**KEYWORD:** Body mass index, Obesity, Blood pressure, overweight, weight, height.

**INTRODUCTION**

The risk of cardiovascular diseases have been observed to be higher among people who are overweight and thus have twice the rate of high blood pressure than subjects with normal weight. The number of health conditions raised by obesity includes high blood pressure and adverse lipid concentrations among adults 1. A research study conducted by Mohamed in 2012, added further evidence for the direct relationship between blood pressure and body mass index, as well as blood pressures and age. Among adults, the body mass index of 25 – 29.9kg/m<sup>2</sup> is considered overweight while the body mass index of 30kg/m<sup>2</sup> and above is considered obese. Body mass index does not directly measure body fat but is a useful means of predicting adiposity in adults and children. The build-up of excess body weight usually result from bones, fats tissues, water and muscles – over weight. The relationship between hypertension and obesity may be related to sodium and fluid retention, adipocyte-mediated effect on angiotensin II, atrial natriuretic peptide level, and leptin mediated

enhancement of sympathetic activity with increase insulin resistance 2,3. According to the American Heart Association, obesity is considered to be a major risk factor for the development of cardiovascular disorders and a cause for premature death in the general population. Excess weight gain is associated with intense activities of the sympathetic nerve chain which raises the blood pressure 4, 5, 6. This is considered to be a major risk factor in the development of cardiovascular diseases.

**Aim of this Study**

The present study is aimed at determining the body mass index of adult male and female subjects in Bayelsa State.

**Objectives of this Study**

To determine the mean and percentage values of adults body mass index in Otuogidi-Ogbia and Sagbama Local Government Area of Bayelsa state.

**Sample of study Population**

Two hundred adult male and female subjects between the age ranges of 20 to 65 years were studied from January through April 2017 in a randomized population sampling in Ogbia, Yenagoa and Sagbama local Government Area of Bayelsa State of Nigeria.

**Inclusion Criteria**

Subjects residing within Ogbia, Yenagoa and Sagbama local Government area that falls between the age ranges of twenty to sixty five years were the ones selected for this study.

**Exclusion Criteria**

Any subject residing outside Bayelsa State, above sixty five and below twenty years of age were excluded from the study.

**Materials for Weight and Height measurement**

The subjects anthropometric profile were measured in kilograms with a standard bathroom and hospital scale

for weight and a calibrated meter rule for height measurement after the removal of heavy outer clothes and shoes to the nearest 0.1kg (10g) (Solomon et al 2015). The weight balance was placed on a level surface with the pointer adjusted to the zero mark before taking the weight of every subjects including their height as well. The body mass index was calculated as weight /square of the height ( $\text{kg}/\text{m}^2$ ). Ender et al (2004).

**PRESENTATION OF RESULTS AND DISCUSSION**

The results obtained from this study were analyzed with SPSS version 20.0. The results are presented in tables and charts in this section.

**Table 1: Male and Female Adults Body Mass Index**

Weight (kg)	80.57±13.68	73.33±13.71	0.00 Significant
Height (m)	1.70±0.05	1.65±0.06	0.00 Significant
BMI (kg/m <sup>2</sup> )	29.02±4.65	28.01±4.56	0.10 Not significant
SBP (mmHg)	141.84±17.49	133.90±17.16	0.01 Significant
DBP (mmHg)	87.29±11.64	82.67±11.22	0.01 Significant

**Table 2: Male Athropomeric Result**

Parameters	n=50 20-45 years	n=54 46-65 years	Significance (p<0.05)
Weight (kg)	80.00±14.92	84.89±23.86	0.11 Not significant
Height (m)	1.71±0.05	1.72±1.12	0.03 Significant
BMI	28.27±5.44	30.09±3.52	0.18 Not significant
SBP (mmHg)	137.44±23.12	149.00±14.31	0.00 Significant
DBP (mmHg)	85.23±9.42	94.71±12.25	0.00 Significant

**Table 3: Female Athropometric Result**

Parameters	n=55 20-45 years (young adults)	n=41 46-65 years (middle age adults)	Significance (p<0.05)
Weight (kg)	74.24±13.33	75.54±13.44	0.02 Significant
Height (m)	1.65±0.06	1.65±0.07	0.01 Significant
BMI(Kg/m <sup>2</sup> )	27.21±4.60	27.56±4.54	0.16 Not significant
SBP (mmHg)	129.41±15.43	140.96±14.83	0.01 Significant
DBP (mmHg)	80.43±11.22	88.58±7.76	0.00 Significant

**Table 4: Comparison of Male Subjects Body Mass Index (Kg/M2) With Blood Pressure**

Parameters	<18.5 Underweight n=5	18.5-24.9 NORMAL n=23	25.0-29.9 Overweight n=45	>30 Obese n=35	Significance (p<0.05)
SBP (mmHg)	135.50±6.36	129.70±13.08	143.36±19.09	149.03±14.41	0.00 Significant
DBP (mmHg)	84.00±16.97	88.36±19.09	90.42±9.85	92.67±10.58	0.00 Significant

**TABLE 5: COMPARISM OF FEMALE SUBJECTS BODY MASS INDEX (KG/M2) WITH THEIR BLOOD PRESSURE**

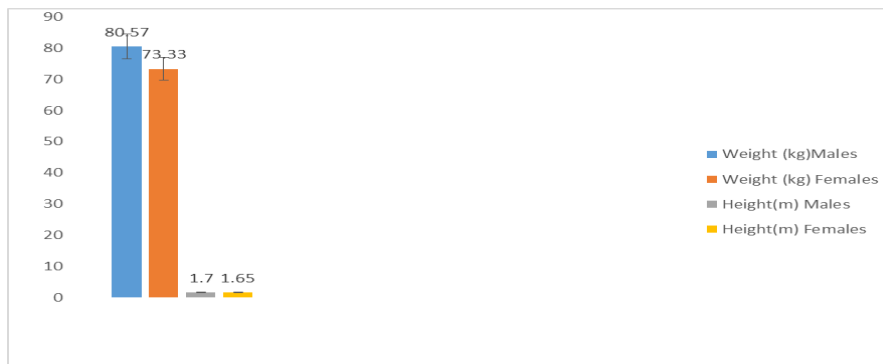
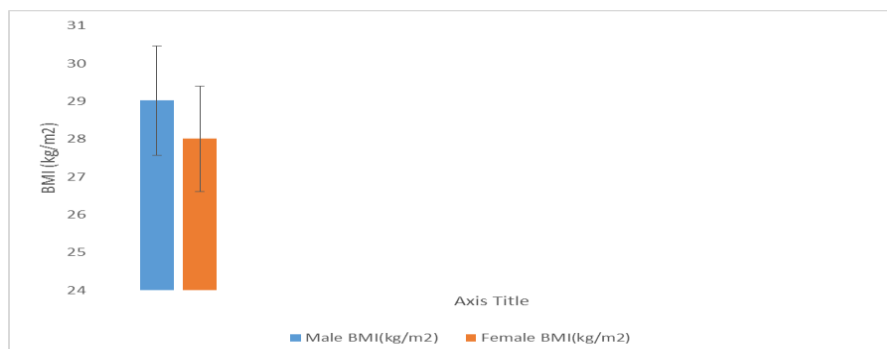
Parameters	<18.5 Underweight n=4	18.5-24.9 Normal n=30	25.0-29.9 Overweight n= 40	>30 Obese n=18	Significance (p<0.05)
SBP (mmHg)	125.00±0.00	129.43±18.63	138.06±16.01	152.25±13.89	0.02 Significant
DBP (mmHg)	78.00±0.00	80.37±10.18	89.11±12.47	92.10±8.35	0.03 Significant

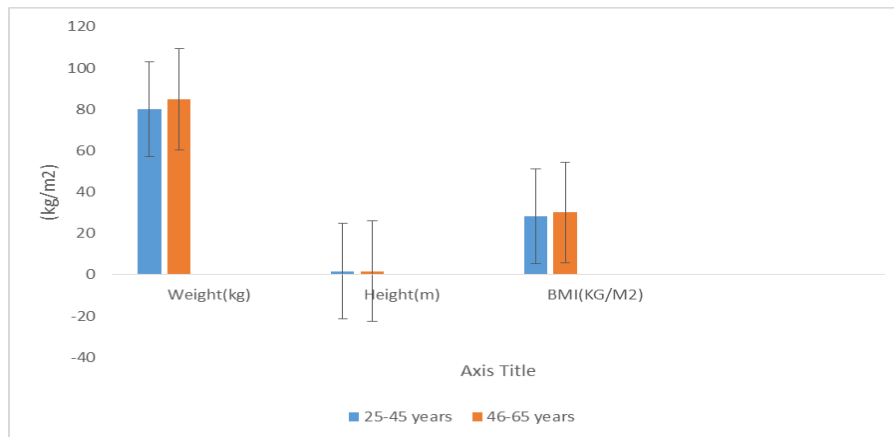
**TABLE 6: CLASSIFICATION OF ADULT MALE SUBJECTS BODY MASS INDEX – WHO 2012**

BMI	FREQUENCY		
	Number	Total	%population
<18.5-24.9 (underweight)	3	3	2.9
18.5.0-24.9 (normal)	25	25	24.0
25.0-29.9(Overweight )	40	40	38.5
>30.0 (obese)	36	36	34.6

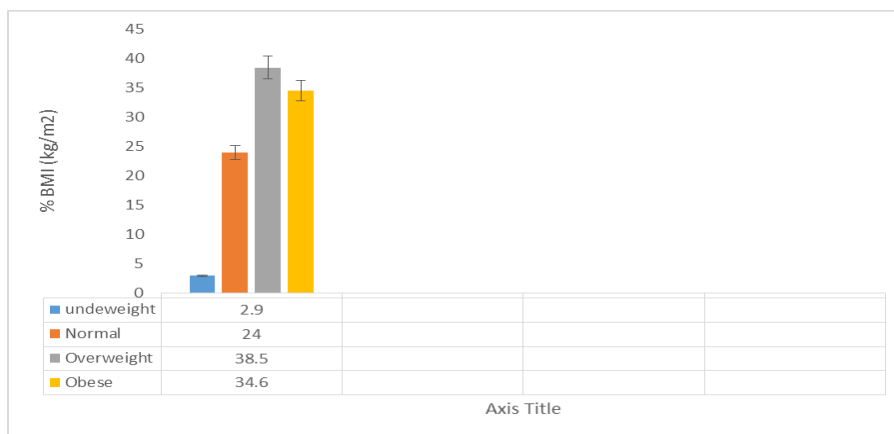
**TABLE 7: CLASSIFICATION OF ADULT FEMALE SUBJECTS BODY MASS INDEX – WHO 2012**

BMI	FREQUENCY		
	Number	Total	%population
<18.5-24.9 (underweight)	2	2	2.1
18.5.0-24.9 (normal)	31	31	32.3
25.0-29.9 (Overweight )	41	41	42.7
>30.0 (obese)	22	22	22.9

**Figure 1: Anthropometric Distribution for Male and Female Subjects****Figure 2: Mean BMI for Male and Female Subjects**



**Figure 3: Male Adult BMI According to age Classification**



**Figure 4: Percentage Distribution of Male Adult Subjects Body Mass Index**



**Figure 5: % Distribution of Female Adult Subjects Body Mass Index**

**DISCUSSION**

The mean weight and height of the adult (male and female) subjects were observed to be of the same significant range with a non-significant body mass index. Thus a significant difference was observed among the younger and older female adult’s weight and height as well as the height of the male adult subjects. Moreover, the percentage population of the male adult subjects studied having underweight was observed to be (2.9%) in Bayelsa State. A considerable number of adult male and female subjects were observed from this study to have entered into the range of overweight. The percentage number of female adult subjects with normal body mass

index was observed to be more than their male counterpart indicating that female are becoming more concern to their health status compared to the past. Ephraim et al also observed a considerable percentage of normal body mass index among adult subjects in Idema community in Ogbia local Government Area of Bayelsa State. Moreover, we observed that more male subjects had high percentage value of obesity (34.6%) compared to their female counterpart (23.0%) with an increase systolic and diastolic blood pressure as well. This may be due to stressful condition that might have exaggerated the sympathetic nerve chain to the vasculatures such as working overtime to ensure the survival of their families.

However, we also observed a high percentage of female subjects with overweight (42.7%) when compared to their male counterpart (38.5%). For the fact that large population of the adults studied were overweight gives more insight on the need by Governmental and non-Governmental agencies, including health institutions etc. to create a public enlightenment campaign programmed on nutrition, exercise, and regular checkup of their anthropometric parameters.

## REFERENCES

1. Cythia Ogden L., Magret carroll et al. Prevalence of obesity in the united states; NCHS data brief, 2010; 82.
2. Folta S.C. et al The strong women Healthy Heart program; reducing cardiovascular disease risk factors in rural sedentary, overweight and obes women. *Am J publ Health*, 2009; 99(7): 1271-1277.
3. Mohamed Eutfi F. Effect of age, body mass index and electrolytes levels on blood pressures of normtensive adults; *k. med J.*, 2012; 05(1): 673-681.
4. San Diego. Health and Human services agency, public health services, community health statistics unit, 2012.
5. Monique C, Whaley C, lastra G, and sowers J.R., Hypertension and the cardio-metabolic syndrome. *Journal of clinical hypertension*, 2005; 7: 471-6.
6. Flegal K.M., Overweight and obesity in the United States; prevalence and trends, 1960-1994. *Int J obes Relat Metabo Disord*, 1998; 22: 39-47.
7. Singh R.B, Beegom R, Niaz M.A, Rissam HS, Thakur AS. Body fat percent by bioelectrical impedance analysis and risk of coronary artery disease among urban men with low rate of obesity; *J. Am coll Nutr*. 1999; 18: 268-73.
8. Zametkin A.J. et al Pediatric aspect of child and adolescent obesity: A review of the past ten years. *J American academy of child and adolescent psychiatry*, 2004; 43(2): 134-150.
9. Ender Afikan, Sible Guidiken, Betul Ugur, Mujdat kara .The effect of body mass index on the cardiovascular risk factors in the patients with essential hypertension; *T.J endo and metabol*, 2004; 2: 49-56.   
Pupmed Do1:101097/HJH,00000000000000413.
10. Akinkugbe O.O, Ojo A.O., The systemic blood pressure in a rural Nigeria population, *Trop Geogr med*, 1968; 20(4): 347-356.
11. Ephraim Emmanuel, Benson chukwunweike; Assessment of the prevalence of obesity in idema community, Ogbia LGA of Bayelsa state. *Asian pac.J. Health sci.*, 2015; 2(2): 20-24.
12. Cynthia L.Ogden Margret Carroll, Brian K. Kit: Prevalnce of childhood and adult obesity in the United States. *JAMA*, 2014; 311(8): 806-814.
13. Alagoa E.L Prince, Mukoro D George, Alagoa-Gbobo D.Dorcas; Body mass index of hypertensive and non-hypertensive residents in semi-urban area of Bayelsa State Nigeria. *IOSR journal of Dental and medical sciences*, 2013; 12(5): 19-22.
14. Uvoh M. Solomon, Olorunfemi Joyce, Amaye-Igonikon T.Babema: Assessment of the growth profile of preschool children in the rural areas of Bayelsa State Nigeria. *AM J. Pharm tech Res.*, 2015; 5(3): 2249-3387.
15. George Papathanasiou, Ethimia Zerua, Loannis Zacharis Maria Papandreou, Effie Papageorgiou, Christina Tzima: Association of high blood pressure with body mass index, smoking and physical activity in healthy young adults. *Cariol. Med J.*, 2015; 9: 5-17.
16. National Center for Health Statistics, (2006). The National Healthand Nutrition Examination Survey (NHANES) analytic and reporting guidelines [online].
17. Oni O.A, Odia J.O, and Iruuegbukpe V. Effect of obesity on hypertension; does increase in body mass index equate persistent and poor control of hypertension in Nigeria, (ISSN:2408-7246), 2014; 1(5): 60-64.
18. Martins D, Tareen N, Pan D, Norris k. The relationship between body mass index, blood pressure and pulse rate among normotensive and hypertensive participants in the third National Health and Nutrition Examination Survey (NHANES). *Cell Mol Biol (Noisy-le-grand)*, 2003; 49(8): 1305-9.
19. Violet K.M, AbelL. T, Brandon S.S, Daniel T.G, Oluwadare A, Body mass index and blood pressure among adolescent school children in limpopo province S.Africa *Revpaediatr*, 2012; 30(4): 562-9.
20. Azadbakht L., Better dietary adherence and weight maintenance achieved by a long term moderate fat diet. *British Journal of Nutrition*, 2007; 97(2): 399-404.
21. Grant JP; Custer R.R, Thurlow J., Current technique of nutritional assessment. *Surgclin North AM*, 1981; 61(3): 437.
22. Holcombe B; Andris D.A., Parenteral nutrition electrolyte/mineral product shortage considerations *J PEN*, 2011; 35(4): 434-436.
23. Ighosotu Silver and Nyerhovwo J. Tonukari., The influence of dietary intake on serum lipid profile, body mass index and risk of cardiovascular diseases in adults on the Niger Delta Region. *Int. J. Nutr metab*, 2010; 2(3): 040-044.
24. Joffa P.K.P, Nwanfor A., Adienbo O.M., Correlation between body mass index and peak expiratory flow rate of an indigenous Nigerian population in the Niger Delta region. *Amjourn of research comm.*, 2013; 1(7): 210-218.
25. Martins D, Tareen N, Pan Norris K., The relationship between body mass index, blood pressure and pulse rate among normotensive and hypertensive participants in the third National Health and Nutrition Examination Survey (NHANES). *Cell Mol Biol (Noisy-le-grand)*, 2003; 49(8): 1305-9.

26. Aucott L and Rothnie H. Long term weight loss from life style intervention benefit blood pressure, a systemic review., 2009; 54(4): 756-62.
27. Kirk S.F., Effective management practice: A review of the lifestyle intervention evidence. *Int J Obes Lon.*, 2012; 36(2): 178-185.
28. Scientific Statement from the American Heart Association Nutrition Committee. *Circulation; Journal of the American Medical Association*, 2006; 240(8): 1339.
29. World Health Organization. Appropriate body mass index for Asian population and its implications for policy and intervention strategies, 2004, 2012; 363(9403): 157-163.