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Original Research Article

Body mass index assessment of ekowe, ikianbiri and nangi-ama indigenes of Bayelsa State, Nigeria

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ABSTRACT

Background: Body mass index (BMI) is one of the several anthropometric parameters used to monitor underweight, overweight and obesity in a population. This study assesses the BMI of adult males and females of the Ekowe, Ikianbiri and Nangi-ama people and to determine if they are normal, underweight, overweight or obese.
Methods: This research was carried out on 405 subjects comprising of 219 males and 186 females. Weight was obtained from the individual standing on the weighing balance and the reading taken in kilograms. Subjects were asked to stand erect with barefoot and the measuring tape was placed from the tip of the heel to the vertex of the head. Body Mass Index was calculated as weight (in kilograms)/height (in meters square) (kg/m2).
Results: Results showed that, for Ekowe, the males had a BMI of 26.0 kg/m2 while the females had a BMI of 27.1. For Ikianbiri, the males had a BMI of 25.1 while the females had a BMI of 22.9. For Nangi-Ama, the males had a BI of 23.0 while the females had a BMI of 26.0. The males and females of Ekowe and the females of Nangi-Ama are overweight. The males and females of Ikianbiri and the males of Nangi-Ama are of a normal weight.
Conclusions: In conclusion, the indigenes of these communities should avoid eating foods of high calories and exercise regularly to keep a normal and healthy weight to avert possible stroke, high blood pressure, coronary heart diseases in later part of their life span.

Keywords: Body mass index, Normal, Underweight, Overweight or obese

INTRODUCTION

Obesity, over weight and underweight has been striking problems in the world today. Body mass index (BMI) is the measurement of body fat based on height and weight regardless of sex. Body Mass Index is the most commonly used measure to monitor the prevalence of overweight and obesity at population level. It is the most commonly used way of estimating if an individual is overweight or obese. Body Mass Index is also known as QUETELET INDEX, which is a value, derived from the weight and height of an individual. Body mass index is a measure of ponderosity or heaviness and it is calculated by dividing weight in kilogrammes by height in metres squared – Wkg/Hm2.[1] Overweight is defined as a body weight that exceeds the acceptable weight for a particular person, based on the individual's age, height and/or frame size.[2] Abnormal BMI (underweight, overweight and obesity) were more frequent in female than male young adult Nigerians and that BMI is an important cardiometabolic parameter.[3] Obesity is defined as a BMI greater than or equal to 30 kg/m.[4,5] BMI is far more commonly used to define obesity and has been found to closely correlate with the degree of body fat in most settings.[5] According to WHO records, a healthy BMI

score is ranging between 18.5- 24.9 and considered normal. A score below 18.5 indicates underweight and thinness. A value above 25.0-29.9 indicates overweight and pre-obese. A value above 30.0 is obese.[6-8] Study on Annang ethnic group showed that the female have higher BMI than the males. There was also a strong positive correlation between the BMI and the weight of the subjects.[9] The relationship between SES and obesity were assessed and whether variations in the body mass index (BMI) of adult Nigerians are influenced by their SES. An inverse relationship was found between SES and BMI.[10] Individuals in the lower SE strata had a greater BMI and a higher prevalence of overweight and obesity.[10] Obesity constitutes a significant public health problem in the developed world.[11] Study to evaluate the prevalence of grades of nutritional status comprising underweight, normal weight, overweight and obesity as well as other measureable anthropometric indicators of BMI in regard to gender, educational level and living area among students settled in Isfahan province. The overall prevalence of underweight, overweight and obesity was 13.9%, 10.4% and 5.7% respectively.[12] Boys and students of the urban areas showed a high tendency of obesity and overweight in comparison with girls and rural students respectively.[12] The liver and the spleen are two of the main body organs are normally examined among others in all abdominal ultrasound scans, the correlation between the sizes of these two organs with height, weight, age and body mass index (BMI) have been investigated with ultrasonic measurements of 50 normal scan data of cross-section of Nigeria population in Jos.[13] It was found that the liver span significantly correlated with body weight ($r = 0.369$, $p<0.01$) and BMI ($r = 0.351$, $p<0.05$) while the splenic length significantly correlated with only BMI ($r = 0.333$, $p<0.05$). Study on the relationship between intraocular pressure and body mass index in a population screened for glaucoma at the University of Port Harcourt, Nigeria. Demographic data include age, sex, race and occupation were assessed. Height was measured with a bathroom scale, Intraocular pressure was measured with Perkins hand-held applanation tonometer and funduscopy was carried out with a direct ophthalmoscope. BMI was calculated as weight in Kilograms divided by the square of the height in meters (weight/height2). A total of 491 subjects were screened. There were 230 males (46.8%) and 261 females (53.2%). About 50% (n = 246/491) of the participants had a normal BMI, 28.7% (n = 141) were overweight while 17.7% (n = 87) were obese. The mean BMI was 25.39±4.82. Most obese participants were females (n = 63.187; 72.41) while most males had normal body weight (n = 131; 53.2%). The relationship between BMI and gender was statistically significant (p=0.00). The mean intraocular pressure of all participants was 16.21±5.01 mmHg. Most overweight (88.6%; n = 241/272) and obese persons (n = 149; 87.6%) had normal IOP. There was however no statistically significant relationship between BMI and IOP (p=0.473; r2 = 0.02). In a population screened for glaucoma at the University of Port Harcourt, Nigeria, we found no statistically different relationship between BMI and IOP but there was a statistically significant relationship between BMI and age.[14] Obesity is a major health problem, and there is an increasing trend of overweight and obese individuals in developing countries.[15] Being overweight or obese is known to contribute significantly to morbidity and mortality rates in various countries around the world. Body Mass Index (BMI) is a measure of adiposity and has been used in many countries for assessment overweight and obesity.[16] The prevalence of obesity is increasing and is recognized as risk indicator of cardiovascular disease in adulthood. This study is aimed at assessing the body mass index of the inhabitant of these communities to ascertain predisposing factors that leads to various health problems such as high blood pressure, coronary heart diseases and amongst others.

METHODS

Study type

This is a cross-sectional study conducted in selected areas such as Ekowe community health centre, Ekowe town hall, Nangi-Ama town hall and Ikianbiri open space. A total of 405 subjects (219 adult males and 186 adult females) were randomly selection within the ages of 18-45 years. The materials used for this study includes weighing balance, measuring tape, notebook, pen.

Study location / duration

The study was conducted in selected areas such as Ekowe community health centre, Ekowe town hall, Nangi-Ama town hall and Ikianbiri open space. This research covers the entire Ward 7 (EKOWE, IKIANBIRIR and NANGI-AMA Communities of Bomo Clan) in the Southern Ijaw Local Government Area of Bayelsa State, in the South-South of Nigeria along the River Nun, whose predominant occupation is mainly fishing and farming. They are dark in complexion and speaks Izon as their common language. The research lasted from November, 2020 to May, 2021.

Inclusion and exclusion criteria

Inclusion criteria

All subjects were indigenes of Ekowe Nangi-Ama and Ikianbiri communities. All subjects were mentally and physically fit. All subjects were free from hand deformity.

Exclusion criteria

Any subject that does not meet the above set inclusion criteria. Any subject that has some form of deformity in the body areas targeted for anthropological assessment that could hinder accurate measurement.

Procedure

Data collection technique

Convenient sampling was done and data was randomly collected from the following communities; Ekowe Nangi-Ama and Ikianbiri.

An informed verbal consent was sought from participants before measurements were carried out for the research.

Weight

Weight was obtained from the individual standing on the weighing balance and the reading taken in kilograms.

Height

Subjects were asked to stand erect with barefoot and the measuring tape was placed from the tip of the heel to the vertex of the head and readings taken in centimeters.

BMI was obtained using the formula,

BMI = weight (in kilograms)/height (in meters square) (kg/m2)

Figure 1: Measurement of weight.

Ethical consideration

We obtained permission to conduct this research from the authorities of the aforementioned communities before carrying out the research and participating individuals were properly enlightened on the purpose and procedure of the study. We also got verbal informed consent from each of the volunteered participants before commencement of measurements.

Statistical analysis

The data obtained was computed and analyzed using Statistical package for social sciences (SPSS) version 20.0 software. Descriptive statistics were generated using the software. The significance difference was tested by Z-test, p-value less than 0.05 was considered statistically significant. The statistical methods like mean, standard deviation (SD), standard error (SE), and Z-test were used for the statistical analysis.

RESULTS

The data collected from this study were analyzed statistically ant the results are presented in the various tables.

Table 1: BMI of Ekowe indigenes.

Sex	Weigh t (kg)	Height (m)	BMI (kg/m^2)	Inference
Male	64.39± 4.11	1.58±0. 10	26.00± 2.16	Overweight
Female	62.42± 4.87	1.53±0. 10	27.14± 2.61	Overweight

Table 2: BMI og Ikianbiri indigenes.

Sex	Weight (kg)	Height (m)	BMI (kg/m^2)	Inferen- ce
Male	62.46± 6.22	1.58±0.1 2	25.14±2 .41	Ove- rweight
Female	60.41± 5.57	1.63±0.0 4	22.86±2 .61	Normal

Table 3: BMI of Nangi-AMA indigenes.

Sex	Weight (kg)	Height (m)	BMI (kg/m^2)	Inference
Male	66.74±6. 27	1.69±0. 06	23.29± 1.60	Normal
Female	69.02±8. 28	1.65±0. 06	25.57± 4.08	Over- weight

Table 4: BMI classification percentile and cut off points.

BMI	Status
BMI less than 16.5kg/m^2	Severely underweight
BMI under 18.5 kg/m^2	Underweight
BMI greater than or equal to 18.5 to 24.9 kg/m^2	Normal weight
BMI greater than or equal to 25 to 29.9 kg/m^2	Overweight
BMI greater than or equal to 30	Obesity
BMI 30 to 34.9 kg/m^2	Obesity class I
BMI 35 to 39.9 kg/m^2	Obesity class II
BMI greater than or equal to 40 kg/m^2	Obesity class III (severe, extreme, or massive obesity)

It was observed that the Ekowe males mean weight of 64.39±4.11, height as 1.58±0.10 and mean BMI value

26.00±2.16 and their female counterparts have mean weight as 62.42±4.87, height as 1.53±0.10 and mean BMI as 27.14±2.61 as shown in (Table 1).

The mean weight of the Ikianbiri males is 62.46±6.22, their height is 1.58±0.12 and BMI is 25.14±2.41 (Table 2). Their females possess mean weight as 60.41±5.57, height as 1.63±0.04 and mean BMI as 22.86±2.61 (Table 2).

The Nangi-Ama males possess a mean weight of 66.74±6.27, height as 1.69±0.06 and BMI of 23.29±1.60 (Table 3). The mean weight of Nangi-Ama females is 69.02±8.28; their height is 1.65±0.06 with a BMI of 25.57±4.08 (Table3).

DISCUSSION

BMI is a useful pointer to weight associated problems in adulthood. A high BMI can be an indicator of high body fatness. The findings of this study indicate that both the males and females of Ekowe indigenes tend to be overweight with BMI of 26.00±2.16 and 27.14±2.61 ($p>0.05$). The Body Mass Index of the female in Ekowe is higher than that of their male counterparts which is in corroboration with the findings of Okoseimiema et al 2016. The results also indicate that the males of Ikianbiri are overweight with mean BMI of 25.14±2.41 and their females had normal BMI with mean value of 22.86±2.61. The male is statistically greater than that of the females ($p<0.05$). There exists a difference in the BMI of the Nangi-Ama people with the males having mean BMI value of 23.29±1.60 which tend to be normal and their females with mean value of 25.57±4.08 which is an indicator of overweight using (Table 4) as a reference point. The female is statistically greater than that of the male ($p<0.05$). This finding is in line with the result of Okoseimiema et al 2016, study on Annang ethnic group were the female have higher BMI than the males. It is very clear that there is sex dimorphism in BMI among population.

Obesity is a major health problem, and there is an increasing trend of overweight and obese individuals in developing countries. Being overweight or obese is known to contribute significantly to morbidity and mortality rates in various countries around the world as posited by Innocent et al 2013. It is visible from our studies that, there is no mean incidence of underweight in all the communities under survey. This study has ostensibly shown that, problems associated with overweight and obesity such as stroke, heart failure, high blood pressure, diabetes mellitus, and coronary heart disease and amongst others will manifest gradually.

Limitations

The riverine nature of these communities is a limitation for access, due to high cost of transportation.

CONCLUSION

BMI is a simple and non-invasive diagnostic tool for weight problems. The Ekowe aborigines both males and females; Ikianbiri males and Nangi-Ama females are more likely predisposed to coronary heart diseases, stroke, diabetes mellitus, heart attack and amongst other illnesses due to the high BMI as they age gradually. The Ikianbiri's and the Nangi-Ama's (males) are less predisposed to these conditions. We recommend that, the indigenes of these three communities specifically Ekowe (both male and female) should cut down their weights, avoid eating food of high calories, exercise regularly to keep a normal and healthy weigh and repetitive health education required.

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