

## Assessment of Body Mass Index of Staff in Kashim Ibrahim College of Education Maiduguri, Borno State

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### Abstract

*This study assessed the body mass index of staff in Kashim Ibrahim College of Education Maiduguri, Borno state. Three hypotheses guided the study. Descriptive Survey research design was used for this study. The population for the study comprised of staff of Kashim Ibrahim College of Education Maiduguri numbering 566 (academic staff 216 and non-academic staff 350). A sample of 57 (males 37, females 20) staff were selected for the study using stratified sampling technique with proportionate method. The instruments used for data collection were Stadiometer attached to the weighing scale (Metler ZT. 120 2010 model made in China) was used in taking the height and weight of the participants. Height and weight of the participants were used to compute their body mass index, using Quetelete Equation. Analysis of data was done using descriptive statistics of mean, standard deviation, frequency counts and percentage. t-test and Analysis of Variance (ANOVA) was used to test hypotheses at 0.05 alpha level of significance. All the hypotheses formulated were retained. It was concluded that there were no significant differences in the hypotheses tested. Based on the results of this study, it was recommended that there should be enlightenment on weight management, which should be integrated approach to physical activity, nutrition, and behavioural management.*

**Keywords:** Body mass index, obesity, body weight, height.

### Introduction

Obesity is a condition in which excess body fat has accumulated to the extent that health is adversely affected. Obesity occurs when someone consumes more calories than he/she can burn through exercise and daily normal activities (WHO, 1997). The Body Mass Index (BMI) is an indicator of the amount of body fat for most people. It is mostly identified through numerical value of one's weight in relation to his height squared. BMI of less than 18.5kg/m<sup>2</sup> is considered underweight. BMI between 18.5 to 24.9 kg/m<sup>2</sup> indicates a normal weight. BMI between 25kg/m<sup>2</sup> and 29.9kg/m<sup>2</sup> is considered overweight, and BMI of 30 to 34.9kg/m<sup>2</sup> is considered obesity I, BMI between 35 to 39.9kg/m<sup>2</sup> is considered obesity II and BMI 40kg/m<sup>2</sup> and more is considered extreme obesity III (WHO, 2005).

In clinical practice, body fat is most commonly and simply estimated by using a formula that combines weight and height. The underlying assumption is that most variation in weight for persons of the same height is due to fat mass, and the formula most frequently used in epidemiological studies is Body Mass Index (BMI). A graded classification of overweight and obesity using BMI values provides valuable information about increasing body fatness. It allows meaningful comparisons of weight status within and between populations and the identification of individuals and groups at risk of morbidity and mortality. It also permits identification of priorities for intervention at an individual or community level and for evaluating the effectiveness of such interventions (WHO, 2007).

According to Anate, Olatinwo and Omesina (1997) there are two types of obesity which are classified into central and peripheral obesity. Central obesity or android obesity is a condition in which fat is distributed commonly on upper part of the trunk (the chest and abdomen) and is more common in the males. Android obesity is more clearly associated with disordered lipid and glucose metabolism and diseases like diabetes mellitus, gout, arteriosclerosis, osteoarthritis, cardiovascular disease especially hypertension and some cancers. Peripheral or gynaeoid obesity, is a condition in which fat is mainly distributed on the hip and thighs and is more common in females. Before the menopause, lipid assimilation is favored in the abdominal and femoral depots. However after the menopause, these differences in fat metabolism between the abdominal and femoral sites disappear (Antonio, Robert, Mercedes, Ariel, Water & Jose, 1998).

Barr, Zimmet and Welborn (2007) identified health risks associated with obesity such as type 2 diabetes, heart disease, high blood pressure, stroke, kidney disease, gall-bladder disease and gallstone, breathing problems and sleep apnea, pregnancy problems such as gestational diabetes (high sugar during pregnancy). People should be cautious of what they do and eat. Regular physical activity such as moderate intense aerobic activity each week, performing house or yard chores, brisk walk or dance to a favourite music for some minutes. Eat better food, eating healthy foods that provide vital benefits such as making half of what's on the plate fruit and vegetables, replace refined grains with whole grains like oatmeal, whole wheat bread and brown rice, get protein from healthy sources like seafood, lean meat, poultry, eggs, beans, unsalted nuts and seeds. Choose unsweetened tea, low-fat milk or water (Physical Activity Guidelines for Americans, 2008). It has been observed that staff of Kashim Ibrahim College of Education Maiduguri are drastically reducing in number due to so many diseases; a good number of them died of hypertension while so many of them suffered partial stroke and heart related diseases. Based on this background, the researchers want to find out the Body mass Index of staff of Kashim Ibrahim College of Education.

## Hypotheses

The following hypotheses were generated for the study:

1. There is no significant difference in the body mass index of male and female staff of Kashim Ibrahim College of Education Maiduguri.
2. There is no significant difference in the body mass index among staff of different age group of Kashim Ibrahim College of Education Maiduguri.
3. There is no significant difference in the body mass index between academic and non-academic staff of Kashim Ibrahim College of Education Maiduguri.

## Methodology

Descriptive Survey research design was used for this study. A survey is a method of research that involves the characteristics of individuals, groups, objects or situation. Survey research method is concerned with the collection of data for the purpose of describing and interpreting existing conditions or practice, beliefs, attitudes and so on. Survey design, according to Thomas and Nelson (1990) is a technique that seeks to

determine the practices or opinions of a specified population on one or more variables. Corner and Norman (2004) stated that the purpose of survey research method is to describe systematically the facts, qualities or characteristics of a given population, event or area of interest concerning the problem under investigation. The use of this design was The population for this study comprised five hundred and sixty six (566) staff of Kashim Ibrahim College of Education Maiduguri (KICOE Establishment Unit, 2015). Out of this population, two hundred and sixteen (216) were academic staff comprising 77 females and 139 males, and three hundred and fifty (350) non-academic staff comprising 119 females and 231 males. Stratified sampling technique with proportionate method was used to sample ten percent (10%) of the population for the study. Ten percent (10%) of the entire population is 56.6 which was approximated to 57 because fractions of human beings cannot be obtained. Twenty-two (22) academic staff comprising 8 females and 14 males, and thirty-five (35) non-academic staff comprising 12 females and 23 males was selected for the study. The selection of the sample was based on Krejcie and Morgan (1979) who stated that in a large population, ten percent (10%) will be appropriate. and the willingness of the participants to partake in the study, which was taken into consideration for the selection of 10 percent of the population as a sample.

The research instruments used in collecting data for this study were as follow:

Stadiometer attached to the weighing scale (Metler ZT. 120 2010 model made in China) was used in taking the height and weight of the participants. Height and weight of the participants were used to compute their body mass index, using Quetelete Equation.

An introductory letter containing the purpose of the research was obtained from the Head of Department, Physical and Health Education of the University of Maiduguri to the Registrar, Kashim Ibrahim College of Education Maiduguri for permission to conduct the research in the college. After obtaining the permission from the college authority the participants were briefed by the researcher about the testing procedures and its benefits. The researcher provided biodata sheet (Appendix B) to record the age, sex, tag number, , height and weight of the participants. Fifty seven tags numbering from 01 – 57 were provided for easy identification of the participants. The participants came up for the testing exercise in the morning 7.30 to 9:00am at the college clinic. Two (2) trained research assistants were used to assist the researcher in data taking; height and weight of the participants.

## **Determination of Obesity**

Weighing scale (Metler ZT.120, 2010 model made in China 2010) was used to determine body weight of the participants in kilogrammes. The body weight of the participants was determined using a Physician's balance beam scale. Participants wore minimal clothing, with no shoes. The beam scale had movable weights, with the scale readable from both sides. The scale was positioned on a level solid floor, and the Nurse (Research Assistant) stood behind the beam, facing the participant whose height and weight was measured. The scale was calibrated each time before use by putting the beam weight to zero (0) to ensure the beam scale was balanced, and a screwdriver was used on the movable tyre weight to adjust the beam weight. The weight of the participants was read to the nearest 0.25kg (David & Nieman, 1999).

Stadiometer attached to the weighing scale (Metlar ZT.120, made in China 2010) was used to determine height of the participants in metres. A vertical ruler with a horizontal headboard was brought into contact with the highest point on the board and was used to determine the height. Each participant stood without shoes, heels together, back as straight as possible, heels buttocks, shoulders, and head touching the wall, looking straight ahead. Weight of the participants was distributed evenly on both feet, arms hanging freely by the sides of the body, before the measurement took place. Each participant deeply inhaled and held the breath, while the headboard was at the highest point on the head with sufficient pressure to compress the hair (to obtain accurate height reading). The Quetelet Equation (body weight in kilograms divided by height in metres squared  $\text{kg/m}^2$ ) was used to determine BMI of the participant. David and Nieman's (1999) classification of BMI (Less than 18.5  $\text{kg/m}^2$  regarded as underweight; 18.5 to 24.9  $\text{kg/m}^2$  as normal; 25.0 to 29.9  $\text{kg/m}^2$  overweight; 30.0 – 34.9  $\text{kg/m}^2$  obesity I; 35.0 to 39.9  $\text{kg/m}^2$  obesity II, while 40  $\text{kg/m}^2$  or more is regarded as obesity III.

Descriptive statistics of mean, standard deviation, frequency counts and percentage were used to describe the bio-data of the participants and answer research questions. One-way ANOVA and t-test were used to test hypotheses. All hypotheses were tested at 0.05 alpha level

## Results

**Table 1**

Demographic Variables of the Participants

n = 57

Variable	Frequency	Percentage
Age (Years)		
20 – 30	8	14.0
31 – 40	13	22.8
41 – 50	19	33.3
51 – 60	14	24.5
61 above	3	5.26
Sex		
Male	37	64.9
Female	20	35.1
Staff Cadre		
Academic Staff	22	38.6
Non-Academic Staff	35	61.4

Table 1 contains the demographic variables of the participants. Three variables were displayed in the table namely age, sex and staff cadre. Breakdown of age brackets shows that there were 8 (14.0%) participants aged 20 – 30 years, 13 (22.8%) aged 31 – 40 years. Those in age bracket of 41 – 50 years were 19 (33.3%), those within the age bracket of 51 – 60 years were 14 (24.5%) and participants aged 61 and above years were 3 (5.26%). This means that most of the participants were between the age bracket of 41 – 50 years 19 (33.3%) followed by age bracket 51 – 60 years 14 (24.5%), then age bracket 31 – 40 years 13 (22.8%), and age bracket 20 – 30 years 8 (14.08), lastly age bracket 61 and above years 3 (5.26%).

With regards to sex of the participants 37 (64.9%) were males, while 20 (35.1%) were females. This means that most of the participants were males (64.9%). With regard to staff cadre, 22 (38.6%) were academic staff while 35 (61.4%) of the participants were non-academic staff. This means that most of the participants were non-academic staff.

**Hypothesis One:** There is no significant difference in obesity (BMI) between male and female staff of Kashim Ibrahim College of Education Maiduguri.

**Table 2**

Summary of t-test on Body Mass Index (BMI) of Male and Female Staff of Kashim Ibrahim College of Education Maiduguri.

Participants	Number	$\bar{x}$	s	df	T	P.Value
Male	37	23.623	±4.760	55	3.524	0.001
Female	20	29.093	±6.899			

Table 2 presents summary of t-test on obesity (body mass index  $\text{kg/m}^2$ ) of male and female staff of Kashim Ibrahim College of Education Maiduguri. The result showed that there was a significant difference in obesity (BMI) between male and female staff of Kashim Ibrahim College of Education Maiduguri ( $P < 0.05$ ), therefore the null hypothesis was rejected.

**Hypothesis Two:** There is no significant difference in obesity (BMI) among staff of different age groups of Kashim Ibrahim College of Education Maiduguri

**Table 3**

Summary of One-Way ANOVA on Body Mass Index ( $\text{kg/m}^2$ ) of Staff of Different Age Groups in Kashim Ibrahim College of Education Maiduguri.

n = 57

Sources of Variance	Sum of Squares	df	Mean squares	F	P.Value
Between groups	119.783	4	29.946	0.759	0.557
Within groups	2051.160	52	39.445		
Total	2170.943	56			

Table 3 contains summary of one-way ANOVA on obesity (body mass index) of staff of different age groups in Kashim Ibrahim College of Education Maiduguri. One-way ANOVA was applied to test the null hypothesis at 0.05 alpha level. The result indicated that there was no significant difference in obesity among staff of different age groups in Kashim Ibrahim College of Education Maiduguri ( $P > 0.05$ ), hence the null hypothesis was retained. Therefore, the null hypothesis was accepted.

**Hypothesis Three:** There is no significant difference in obesity (BMI) between academic and non-academic staff of Kashim Ibrahim College of Education Maiduguri

**Table 4**

Summary of t-test on Body Mass Index ( $\text{kg/m}^2$ ) of Academic and Non-Academic Staff of Kashim Ibrahim College of Education Maiduguri

n = 57

Staff Cadre	Number	$\bar{x}$	S	Df	t	P.Value
Academic Staff	22	27.136	±5.872	55	1.419	0.161
Non-Academic Staff	35	24.760	±6.323			

Table 4 presents summary of t-test on obesity (body mass index) of academic and non-academic staff of Kashim Ibrahim College of Education Maiduguri. t-test was applied to test the null hypothesis at 0.05 alpha level. The result revealed that there was no significant difference in obesity (body mass index) between academic and non-academic staff of Kashim Ibrahim College of Education Maiduguri ( $P > 0.05$ ), hence the null hypothesis was retained. Therefore, the null hypothesis was accepted.

## Discussion

The rate of obesity is highest among middle aged Americans, and it is lowest among adults between 20 and 39 years of age (Ogen, Carroll, McDowell and Flegal, 2007). And at the same time, age category (20-39years), close to 30% of the population is reported to be obese. In the West African countries such as Ghana and Republic of Benin, obesity is found in 13.6% and 18% respectively among adults (Amoah, 2003 and Sodjinou, Agueh, Fayomi and Delisle, 2008) while Abubakari, Jones, Lauder, Agyemang, Kirk and Bhopal (2008) reported prevalence of 10% in the West African sub-region with the odd of being obese being 3.2% among urban women compared to men.

Obesity is becoming more prevalent in many African and other developing countries with nutritional transition as a result of urbanization, adoption of western lifestyles and demographic transition being implicated for the upsurge (Ojofeitimi, Adeyeye, Fadiora, Kuteyi, Faborode, Adegbenro, Bakare, Setiloane and Towobola, 2007). Nigeria is witnessing both demographic and epidemiologic transitions and these could be some of the possible reasons why the prevalence of non-communicable diseases is increasing (Adeyemo, Luke, Cooper, Wu, Tayo, Zhu, Rotimi, Bouzekri and Ward, 2003). There is a general misconception in Nigeria that obesity is a sign of affluence (Adeyemo et al 2003).

Ojofeitimi, Adeyeye, Fadiora, Kuteyi, Faborode, Adegbenro, Bakare, Setiloane and Towobola (2007) found that 21.2% of their respondents were obese while Kadiri and Salako (2007), Adeogun (2011) also found obesity in 21% and 28% of males and females respectively in a study of 146 middle-aged Nigerians. Ben-Bassey, Oduwole and Ogundipe (2007), observed that in many of the urban centers of the developing countries, a change in lifestyle due to increased affluence has been observed, and this change in lifestyle is an important factor in the global epidemic of overweight and obesity. Also as observed by Adeogun, Setonji and Owoyemi (2010), the obesity epidemic is especially evident in industrialized nations where many people live sedentary lives and eat more convenience foods, which are typically high in calories and low in nutritional value.

## Conclusion

Based on the findings of the study, it was concluded that female have higher BMI than male; also age and the type of work have no significant difference on individual member of staff of Kashim Ibrahim College of Education Maiduguri, Borno State.

## Recommendations

Based on the conclusion of this study, the following recommendations were made:

1. There should be enlightenment on weight management, which should be integrated approach to physical activity, nutrition, behavioural management.
2. There should be Encouragement to participate in regular physical activity at recommended levels.

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