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Body Mass Index as a Predictor and Incidence of Overweight and Obesity among Staff in Tertiary Educational Institutions in Bauchi State, Nigeria

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Abstract
The study determined Body Mass Index as a Predictor and Incidence of Overweight and Obesity among Staff in Tertiary Educational Institutions in Bauchi State, Nigeria.The total population of this study was 5,845 academic and non-academic staff of the six (6) Tertiary Educational Institutions. Proportionate sampling technique was used and selected five hundred and eighty five (585) samples (10%) but only four hundred and forty three (443) participated in the study. The instruments used for data collection in this study were weighing scale attached with Stadiometer to measure weight and height of the participants respectively. Quetelet Equation (body weight in kilogrammes divide by height in metre squared (kg/m^2) was used and computed body mass index of each participant. Descriptive statistics were used and described the bio-data of the participants while Chi-square analysis was used and determined differences between observed and expected Body Mass Index among Staff of Tertiary Institutions in Bauchi State. The results of the study indicated that there is significant unhealthy Body Mass Index (BMI) among staff of tertiary institutions in Bauchi State. It was recommended among others that, more sporting facilities should be provided in tertiary institutions in Bauchi State and regular exercise should be organised by the management of all the tertiary institutions of Bauchi State. Similarly, there should be regular sensitisation on the benefits of regular physical exercise among the staff irrespective of cadre.

Keywords: *Body Mass Index,Overweight, Obesity, Staff, Tertiary Educational Institutions*

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I. Introduction

Obesity is a condition in which excess body fat 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 physical activities (World Health Organisation, 2016). Body Mass Index (BMI) is an indicator of body fat for most people. It is mostly identified through numerical value of one's weight in relation to his height square. BMI of less than 18.5kg/m^2 indicates underweight; BMI between 18.5kg/m^2 to 24.9kg/m^2 indicates a normal weight and BMI between 25kg/m^2 to 29.9kg/m^{2}indicates overweight.Similarly, BMI between 30kg/m^2 to 34.9kg/m^{2}indicates obesity I; BMI between 35kg/m^2 to 39.9kg/m^{2}indicates obesity II and BMI equal or greater than 40kg/m^2 indicates obesity III (World Health Organisation, 2015).

Globally, the health implications of having too much fat in the body and its consequences have gained prominence as many studies have revealed the trend in different countries. In a study covering 19.2 million participants from across 200 countries spanning from 1975-2014 severe obesity seems to be more rampant in the United States of America and China (Romero-Corral, Montori, Somers, Korinek, Thomas, Allison, Mookadam, Lopez-Jimenez, 2016). In Nigeria, the prevalence of overweight individuals ranged from 20.3% -35.1% while the prevalence of obesity ranged from 8.1% - 22.2%,which indicated that, the prevalence of overweight and obesity in Nigeria is of epidemic proportions (Chukwuonye, Chuku, John, Ohagwa, Imoh, Ejiji, Ogah, &Oviasu, 2013). In these days, it has been observed that, sudden deaths which are expected to be associated with one or combination of degenerative diseases are increasing among the populace. Experienced civil servants are reducing in number; many of them suffered partial stroke and heart related diseases whileothers are retiring on medical ground.

Statement of the Problem

Bauchi State has Tertiary Educational Institutionswith good number of staff (Academic and Non-academic) who are trained with experiences in different area of specializations always ready to impart

knowledge to students so as to produce trained and qualified candidates to work in both public and private institutions. From observation, the life style of staff of Bauchi State Tertiary Educational Institutions has changed in terms of feeding, mobility and other social amenities (eating whatever they want at any time, riding flashy cars and going to clubs or staff common room to sit and drink) without going to the college gymnasium to participate in physical activities so as to burn the excess calories, which leads to the development of some hypokinetic diseases and even death.

There were reports of many sick lives among staff every year while one to two staff die every two years as a result of chronic degenerative disease such as high blood pressure, heart attack, stroke, diabetes or cancer. There were also reports from medical and health personnel through verbal interview and media advert about increasing cases of sudden illnesses and deaths among civil servants related to high blood pressure, high cholesterol, high or impaired blood glucose and increased overweight. However, knowledge of Body Mass Index will greatly help individuals to overcome the negative consequences of obesity and related complications. It is against this background that this study will be conducted to determine Body Mass Index as a Predictor and Incidence of Overweight and Obesity among Staff in Tertiary Educational Institutions in Bauchi State, Nigeria.

II. Methodology

A survey research design was adopted for this study. A survey study was chosen because it is designed to gain more information about characteristics within a particular field of study with a purpose of providing a picture of situations as they naturally happen (Asika, 2000).This design is appropriate to this study because Body Mass Index of Staff in Tertiary Educational Institutions in Bauchi State was determined as a Predictor and Incidenceof Obesity.The total population of this study was5,845 academic and non-academic staff of the six (6) Tertiary Educational Institutions(owned by Bauchi State Government).The six (6) Tertiary Educational Institutions are as follows with their population:

Table 1: Population of the Study

S/N	Institution	Location	Number of Staff				Total
			Academic		Non-Acad		
			Male	Female	Male	Female	
1.	AbubakarTatari Ali Polytechnic, Bauchi	Bauchi	1,373	66	346	147	1,932
2.	Aminu Saleh College of Education, Azare	Azare	1,486	81	398	142	2,107
3.	College of Agriculture, Bauchi	Bauchi	392	24	135	36	587
4.	College of Education, Kangere	Kangere	346	39	99	26	510
5.	College of Health Technology, Ningi	Ningi	291	13	15	12	331
6.	A.D Rufa'I College for Legal and Islamic Studies, Misau	Misau	201	18	131	28	378
	Total						**5,845**

Proportionate sampling technique was used and selected five hundred and eighty five (585) samples (10%) of the total population for the study. However, only four hundred and forty three (443) samples participated in the study while there was mortality of 142 samples. According to Krejie and Morgan (1979)sample size of 10% of total population is enough for a study.

The instruments used for datacollectionin this study include weighing scale (meter zt. 120 made in China) attached with Stadiometerto measure weight and height of the participants respectively. Similarly, Bio-data sheet was used to record the age, gender, tag number, height, weight and Body Mass Index of the participants.Two (2) trained research assistants(registered Nurses)helped the researchers and took data (height and weight)while the lead researcherrecorded the data in the data record sheet immediately. Body height (stature) was measured in metre (m) with a vertical ruler when the horizontal headboard brings into contact with the highest pong on the head. Body Weight was measured using Weighing scale while a participant wore light T-Shirt, with no shoes. The weighing scale was positioned on a level solid floor. Weight was recorded to the nearest 0.5kg.Quetelet Equation (body weight in kilogrammes divide by height in metre squared (kg/m^2) (David &Nieman, 2016) was used and determine body mass index of each participant. Descriptive statistics of mean, standard deviation, frequency counts and percentage were used and described the bio-data of the participants; while t-test was used and determined differences of body mass index between gender, age groups and cadre.Multiple regressions were used and determined differences of body mass index among staff of all Tertiary Educational Institutions under study.

III. Results

The resultsof the study were presented in tables for interpretation and discussion.

Table 2: Demographic Information of the Respondents

	Variables		Frequency	Percentage
1.	Institutions	AbubakarTatari Ali PoltchnicBauchi	101	22.8
		Aminu Saleh College of Education, Azare	106	23.9
		AD Rufai College for Legal and Islamic Studies, Misau	62	14.0
		College of Agriculture, Bauchi	98	22.1
		College of Health Technology, Ningi	76	17.2
		Total	**443**	**100**
2.	Age	18-30years old	50	11.3
		31-43years old	137	30.9
		44-56years old	202	45.6
		57years old	54	12.2
		Total	**443**	**100**
3.	Gender	Male	382	86.2
		Female	61	13.8
		Total	**443**	**100**
4.	Cadre	Academic Staff	247	55.8
		Non-academic staff	196	44.2
		Total	443	100

Table2 above showed the demographic information of the respondents; the table reveals that 106(23.9%) of the respondents were from Aminu Saleh College of Education, Azare. 202(45.6%) of the respondents were between the age range of 44years and above. The table further shows that 382(86.2%) of the respondents are male, the table also shows that 247(55.8%) of the respondents were academic staff.

Hypothesis: There is no significant difference inthe healthy Body Mass Index among staff of tertiary institutions in Bauchi State

Table 3: Chi-square Analysis on the BMI among Staff of Tertiary Institutions in Bauchi State

Cells	less than 18.5kg/m2 (Underweight)	18.5-24.9kg/m2 (Normal)	25kg/m2/29.9kg /m2 (Overweight)	30kg/m2-34.9kg/m2 (Obesity 1)	df	x^2_{cal}	Sig	Dec.
Observed	8.0(2%)	158(35.4%)	159(35.6%)	118(27%)				
					1	248.34	.001	H0. Rejec.
Expected	110.75	110.75	110.75	110.75				

Table 3 revealed the analysis of Chi-square on difference among staff of Bauchi State tertiary institutions in BMI. The table reveals that the calculated Chi-sqaure was 248.34 with the calculated P=value of .001, this indicates a significant difference and therefore, the hypothesis was rejected. The table indicates that most of the staff are either overweight or belongs to obesity category one, only 158(35.4%) are within normal BMI.

IV. Discussion

The result of the tested hypothesis revealed that there is significant difference in the Body Mass Index among staff of all tertiary institutions in Bauchi State (x^2cal=248.34, P=.001). The result as presented in table 2 shows that majority of the respondents belongs to category of either overweight of obesity category I. This finding was supported by the finding of the study where it was reported that prevalence of obesity has increased dramatically in recent decades (Ahluwalia, et al., 2015). It was further reported that from 1975 to 2014, global rates of obesity increased from 3.2 to 10.8% in men and from 6.4 to 14.9% in women (Bomberg, *et al*., 2012). The worldwide prevalence of obesity has doubled since 1980 to an extent that nearly a third of the world's population is now classified as overweight or obese. Obesity rates have increased in all ages and both sexes irrespective of geographical locality, ethnicity or socioeconomic status, although the prevalence of obesity is generally greater in older persons and women. This trend was similar across regions and countries, although absolute prevalence rates of overweight and obesity varied widely.

V. Conclusion

Based on the objectives and findings of this study, there is significant unhealthy Body Mass Index (BMI) among staff of tertiary institutions in Bauchi State as only 158(35.4%) are within normal BMI while 159(35.6%) are overweightand 118(27.0%) belongs to obesity I category.

VI. Recommendation

Based on the conclusion drawn, the following recommendations were made:

1. Regular exercise should be organised by the management of all the tertiary institutions of Bauchi State, as this will go a long way in reducing the cases of obesity among staff.
2. More sporting facilities should be provided in tertiary institutions in Bauchi State.
3. There should be regular sensitisation on the benefitsof regular physical exercise among the staff of different cadre.

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