ASSESSMENT OF BODY WEIGHT AND ASSOCIATED HEALTH RISKS OF TEACHING AND NON-TEACHING STAFF OF THE UNIVERSITY OF UYO, UYO. AKWA IBOM STATE

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Abstracts

The study investigated the associated health risks of body weights of the Teaching staff (TS) and the Non-Teaching staff (NTS) of the University of Uyo. The objectives includes standing height, body weight, body mass index (BMI), rate of healthy weight, overweight and obese weight class. Six hypotheses were generated to guide the study. The instrument used for data collection was stadiometer. A sample size of 282 staffs comprising 94 Teaching staff and 188 Non-Teaching staff was selected by multi-stage cluster random sampling from 7 Faculties and 47 Departments. The t-test was used and set at $P \geq 0.05$. The results of the health implications from Body Mass Index shows that the Non-Teaching Staff were higher in rate of healthy weight and overweight, while the Teaching staffs were more in obese weight members. There was no underweight member among the two groups. Based on findings, the study shows that the teaching staffs were significantly taller, heavier with more BMI. That shows that both the TS and NTS are susceptible to range of health risks of overweight and obese weight that includes; high blood pressure, diabetes, cardiovascular diseases, among others. The study exposes the staff of the University of Uyo to their body weight status. With the knowledge of their body weight status, those in ideal weight group will strive to maintain their BMI while those in overweight and obese weight group are exposed to weight management strategy by participating in well-organized fitness programmes in order to maintain a healthy weight.

Keywords: Body Weight, Associated Health Risks, Teaching Staff, Non-Teaching Staff, Body Mass Index

Introduction

Human body weight refers to a person's mass measured in kilograms in the metric system or pounds in the metric system. Body weight may be measured with clothes on, but without shoes or other heavy items using mechanical or digital weighing scales. Excess or reduced body weight is regarded as an indicator of determining a person's health status (WHO, 2023). Underweight, overweight and obese weights have posed serious health risks to many individual who could not maintain a healthy weight status (WHO, 2023). Having excess weight can affect a person's risk of developing a number of health conditions, including obesity, type 2 diabetes, high blood pressure, and cardiovascular problem (CDC, 2023)

Body weight varies throughout the day as the amount of water in the body is not constant. It changes frequently due to activities such as drinking, urinating or exercise. Sometimes, professional athletes and others trying to keep amount of body weight as in

boxing and beauty contest may deliberately dehydrate themselves to enter a lower weight class in a practice known as weight cutting (Smith, 2023). It is important that individuals avoid becoming underweight, overweight or obese weight as they constitute health risks.

A health risk is something that increases the chances of developing a disease. It could be explained as an attribute, characteristics or exposure that increases the likelihood of a person developing a disease or health disorder. Dariush, (2015) listed ten most common lifestyle that over time can cause health problems from lack or over indulgence in them. These are: physical activity and nutrition, overweight and obesity, tobacco, substance abuse, stress, violence, and quality of environmental immunization and access to health care.

An associated health risk is one that is linked commonly to a health issue. For example overweight and obesity are commonly associated with a number of health risks including high blood pressure, diabetes, musculoskeletal disorders and cancer (WHO 2016).

Overweight and obesity are two non-communicable diseases that often go together. Long term overweight leads to obesity and obesity-related morbidity is becoming a problem of increasing importance in many developing countries (WHO, 2022). According to the World Health Organisation report (WHO, 2021), about 1.2 billion people worldwide are overweight and at least 300 million of them are obese. WHO further projected that over one billion adults worldwide will be obese by 2030. This prevalence of obesity can be attributed to urbanisation and economic development, a nutritional transition characterised by a shift to diets of higher energy content and to the reduction of physical activity resulting in changes in individuals' body composition (Caballero, 2017).

Overweight and obesity are conditions of abnormal or excessive fat accumulation in the adipose tissues of the body (WHO, 2015). Body Mass Index (BMI), expressed as the ratio between weight (measured in kilogram) and the square of height (in metres), is commonly used to measure the 'degree of fatness'. Overweight is a BMI value between 25 and 29.9, whilst a value above or equal 30 is defined as obese (WHO, 2020). Normal weight is characterised by a BMI of between 18 and 24.9.

Overweight and obesity are associated with a number of health conditions, including hypertension, type 2 diabetes mellitus, cardiovascular diseases, cancer, gallstones, respiratory system problems and sleep apnea (WHO, 2021). According to the Hall, & do (2015), up to 20% of the population in developed countries may suffer from obesity-associated hypertension, which may account for 78% and 65% of essential hypertension in men and women respectively. Hypertension is generally associated with a systolic blood pressure exceeding or equals 140 mmHg or a diastolic blood pressure of 90 mmHg or higher (WHO, 2023). Systolic and diastolic blood pressures are used to categorise normal blood pressure, pre-hypertension, stage-one hypertension and stage-two hypertension.

Although more people in developing countries now die from obesity-associated diseases, including ischemic heart disease, diabetes mellitus and cancer (WHO,2015), many people are still under the impression that overweight and obesity affect only the Western world and that lower resource countries continue to struggle with only underweight, malnutrition and infections. This may not be the case because the obesity epidemic is growing faster in developing countries than in the developed world (Adeyemo, *et al.* 2013).

Overweight and obesity can be affected by traditional practices. In some states in Nigeria especially Cross River and Akwa Ibom, some married women are fed in confinement after the birth of their first child in a custom called Fattening room. They were confined to a sedentary life without any form of physical exercises and fed enormously. The fatter and plump the women were the better the acceptance of the custom. With lack of any scientific knowledge of overweight and obesity, the women were directly molded into an overweight and obese body composition. Thus a fatty body was seen as a socially accepted custom in some cultures in Nigeria. In general, the countries with lower prevalence of overweight and obesity tend to be those with low gross domestic product per capita and vice versa, suggesting that socio-economic status may be a determinant of overweight and obesity in some African countries (WHO, 2016). The reason being that they cannot afford a balanced diet but subjecting their diet patterns to starchy foods.

Teaching staff can be defined as people usually called academics who serve as classroom teachers or lecturers. This is specific to people who have been given courses (subjects) to teach and to examine the students while the non-teaching staff form a category of persons employed in the school system who do not serve as classroom teachers. This can include Administrative staff, Guidance Counselors, Liberians, Food service personnel, Transport and Security workers. Definitely, non-teaching staff does outnumber the teaching staff in many schools as they are spread across many sections and units including Faculties and Departments. The two groups work harmoniously to achieve the goals of the school management. Thus teaching and non-teaching staffs are equally important to the school system as they work in synergic roles to provide quality services to the school administration and the students, thereby uplifting the lofty goals of education and economy.

Overweight is commonly understood to mean excessive body weight. The term 'Obesity" is from the Latin word "Obesitas", which means, 'stout, fat, plumb. "Esus" is the past participle of 'edere", meaning 'to eat, with "OW' (over) added to it, It becomes "to overeat and become fat", (WHO, 2024). The Oxford English Dictionary documents its first usage in 1011 by Randle Cotgrave (Oxford English Dictionary, 2010). The Body Mass Index has been used by the WHO to classify obesity and abnormal body weight generally. It is a simple index of body weight and height that is commonly used to classify body mass in certain categories of people. The index is not commonly applied to children, very physically active people and trained athletes, the elderly and the infirm but to the sedentary youth and adults. The BMI is generally used as a means of correlation between two groups related by general body mass and can serve as a means of estimating adiposity status (classification) and not directly as actual percentage of fats. The index is suitable in recognizing trends within sedentary individuals as there is a smaller margin for error (NHCE, 2015). According to WHO, 2011 and 2016, consideration for BMI is acceptable, if the population studied is homogenous in certain factors connected to increase or loss of body mass. These are: Same food available; Similar body proportion in the racial group; Same environment - with same climatic, social occupation or relative activity of the population.

Thus it can be used to classify the University of Uyo staffs who are residents of same race; and of same occupation. The BM1 is a heuristic (refers to experienced based techniques for problem solving, learning and discovery) proxy for human body fat based on an individual's height and the appropriate body weight that should accompany the height. It was a composition that arose from Social Physics, developed between

1830 and 1850 by a Belgian polymathematician, Adoiphe Quetelet (1796-1874), hence also called Quetelet Index (Eknoyan, 2007). The BM1 is calculated and defined as the body weight (BW) in kilogrammes (kg) divided by the square of the body height (HT) in metres (M) that is M/H^2. For the purposes of this study the WHO's International Classification Chart of adults and youth range of body mass profile by BM1 is used as shown below:

BMI (kg/h2)	Health implications
≤ 16.00	Severe thinness class
16.00 - 16.99	Moderate thinness class
17.00 - 18.49	Mild thinness class
18.50 - 24.99	Normal (ideal) weight class
25.00 - 25.99	Overweight class
26.00 - 29.99	Pre-obese class
30.00 - 34.99	Mildly obese class
35.00 - 39.99	Moderately obese class
≥ 40.00	Morbidly obese class

(Source: WHO, 2016)

Human height or stature is the distance from the bottom of the foot to the top of the head of a human body, when one stands in an erect position. It is measured using a stadiometer, usually in both metric and imperial systems. The study of height is known as auxology (Amrita, 2023). Growth has long been recognized as a measure of the health of individuals, hence part of the reasoning for the use of growth charts. For individuals, as indicators of health problems, growth trends are tracked for significant deviations and growth is also monitored for significant deficiency from genetic expectations. Genetic trait is a major factor in determining the height of individuals, though it is far less influential in regard to differences among populations. Average height is relevant to the measurement of the health and wellness (standard of living and quality of life) of populations *(Bolton-Smith, 2000).* When populations share genetic backgrounds and environmental factors, average height is frequently characteristically within the group. Exceptional height variation (around 20% deviation from an average) within such a population would sometimes result in gigantism or dwarfism, which are medical conditions caused by specific genes or endocrine abnormalities (Ganong, 2001). According to NCD Risk Factor Collaboration (2016) on average height data for men and women around the world, Nigeria has average height as 165.9cm for men and 157cm for women. Although these are averages, many people fall above or below the average height line. However, height alone doesn't cause any particular health problems. But taller and shorter people are more at risk of certain health conditions.

The development of human height can serve as an indicator of two key welfare components, namely nutritional quality and health (Baten, 2016). In regions of poverty or warfare, environmental factors like chronic malnutrition during childhood or adolescence may result in delayed growth and/or marked reductions in adult stature even without the presence of any medical conditions. Certain studies have shown that height is a factor in overall health while some suggest tallness is associated with better cardiovascular health and shortness with longevity (Samaras, 2002). While tallness is an adaptive benefit in colder climates such as found in Europe, shortness helps dissipate body heat in warmer climatic regions (Chan, 2015).

Consequently, the relationships between health and height cannot be easily generalized since tallness and shortness can both provide health benefits in different environmental settings. At the extreme end, being excessively tall can cause various medical problems, including cardiovascular problems, because of the increased load on the heart to supply the body with blood, and problems resulting from the increased time it takes the brain to communicate with the extremities (Deng, et al. 2023).

Women whose height is under 150 cm (4 ft 11 in) may have a small pelvis, resulting in complications during childbirth such as shoulder dystocia, a condition when, after delivery of the head, the baby's anterior shoulder gets caught above the mother's pubic bone. (Munabi, *et al.*, 2015). Body height has been found to be positively associated with the prevalence of lower back pain in both genders in young people. However, in a population study of adults over a 40-year age span, the risk of lower back pain was increased among tall men than shorter men (Shiri, *et al.*, 2010, Hershkovich, *et al.*, 2013).

Overweight and obesity in sedentary persons are cause generally by the weight-gain through certain factors like excessive energy food intake and a lack of physical activity (Yusuf, *et al.* 2013). A limited number of cases are also due primarily to genetically induced problems and, or psychiatric illness (Adedoyin, et al. 2022). In contrast, increase rates of overweight and obesity at a societal level are felt to be due to an easily accessible and palatable diet; and an increased reliance on cars and mechanized devices, example use of remote control devices that prevents body movements from place to place. Alrashidi (2016) had identified ten possible contributors to the recent increase of obesity: Insufficient sleep; Endocrine disruptors (environmental pollutants that interfere with lipid metabolism); Decreased variability in ambient temperature (cold climate encourages obesity than hot climate); Decreased rates of smoking, because smoking represses appetite. People who stop smoking however gain weight due to return of appetite; increased use of medications that can cause weight gain. Example a typical antipsychotics; Proportional increases in ethnic and age groups that tend to be heavier; Pregnancy at a later stage (which may cause susceptibility to obesity in children); Epigenetic risk factors passed on generationally; Natural and customary practices causing higher BMI. Example cultural practice like fattening-room practice in Africa especially by the Bantu of South African, Negroes of Akwa Ibom and Cross River States, and the Ashantis of Ghana. They subject women to months of fat accumulation in the fattening practices soon after delivery; Un-selective genetic-mating leading to increased concentration of obesity risk factors among partners (where an obese-and-obese marriage would produce obese children). Caballero (2017), also submitted causes as: Uncontrolled dieting; sedentary life style (lack of exercise); genetics; psychiatric disorders; medications that cause changes in body composition ; social determinants such as: smoking; increased family responsibilities example more number of children; social status-people of higher status especially high income earners gain more weight on the average than low-income people; urbanisation – urban people are less physically active; malnutrition in early life that triggers storage of fats in the face of having plenty to eat in later life. pathophysiology – where one cannot produce leptin that regulates appetite resulting in overeating habit.

According to WHO (2016), Underweight problem is a body mass problem, causes are considered to vary too as in gaining abnormal weight and obesity; Consistent prolonged diseases like asthma, tuberculosis, anemia; Stressful life (Distressful) without adequate dieting to replace loss of energy promptly; Natural selection through religious

practices of long fasting rites; Disasters from wars, natural calamities, etc. where adequate feeding will become impossible.

The study was conducted to examine the rate of underweight, ideal weight, overweight and obese weight and the health risk factors in a University environment in Nigeria.

Statement of the Problem

Obesity is becoming increasingly 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. Overweight and obesity are among the non-communicable diseases that have overtaken communicable diseases as the leading causes of morbidity and mortality in Nigeria (Adedoyin, et al. 2022). Overweight and obesity are associated with a number of disease conditions, including hypertension, type 2 diabetes mellitus, cardiovascular diseases, cancer, gallstones, respiratory system problems and sleep apnea (Amole, et *al.* 2011). The socio-economic factors have been noted to play a serious role in feeding patterns of individuals (Wang, and Dietz, 2012). Culturally, people in the socio-economic class believed that an endomorphous body size is a sign of wealth and being well-fed (Dhurandhar, 2016). This concept of wealth, well-feeding and fat body appearance have subjected many to blow up their body weight in over eating and avoiding anything that can reduce their body weights. The professional class belongs to the highest socio-economic class which includes the Teaching staff and the Non-Teaching staff of the University of Uyo. Socio-economic status many times dictates preferences in diets and nutrition by many (Sweeney, & McCoy, 2023).

The University staff mostly comprised the Teaching staff and Non-Teaching staff that are tied down to their work. For the Teaching staff, hardly do they have time for exercises that could help reduce their overweight and check obesity. The researchers had observed over times that most of the staff especially the Teaching staff just leave the offices to lecture rooms and thereafter back to their homes. They do not see the need of making use of the fitness centers of the University which could be the cause of their overweight and obese weight body nature. The University of Uyo is part and parcel of the greater Nigerian territory and it becomes necessary to combat the menacing effects of being overweight or obese in the University, there is a need to have a good knowledge of the rate of overweight and obesity among the staff, and to address the problems appropriately. Observation has shown that most Teaching staff and Non-Teaching staff of the University irrespective of gender are having protruding stomach, this is worrisome. The researchers did examine existing related literature on overweight and obesity in Nigeria and could not find one on the University community that could establish an existing prevalence and trends of overweight and obesity in the University of Uyo. But, there are some literature on overweight and obesity in Nigeria generally on different populations; (Kadiri; Salako, 2015; Sodjinou, et al.2016 and Adedoyin, et al.2022) so, there is a paucity of literature that specifically examined the University communities in Nigeria as found in Ofori-Asenso, *et al.* (2016). It was against this backdrop that the researchers seeks to assess the body weight and the rates of healthy weight, overweight and obese weight among the staff (Teaching and non-Teaching) of the University of Uyo, Uyo, Akwa Ibom State.

Objectives of the Study

The purpose of the study was to assess the body weight and associated health risks of the Teaching staff and the Non-Teaching staff of the University of Uyo, Uyo, Akwa Ibom State. Specifically, the study seeks to achieve the following objectives:

1. To determine the difference in the means of standing height (SHT) between the Teaching staff (TS) and the Non-Teaching staff (NTS) of the University of Uyo.
2. To determine the difference in the means of body weight (BWT) between the Teaching staff and the Non-Teaching staff of the University of Uyo
3. To determine the difference in the means of Body Mass Index (BMI) between the Teaching staff and the Non-Teaching staff of the University of Uyo.
4. To determine the difference in the means of BMI of Ideal weight members between the Teaching staff and the Non-Teaching staff of the University of Uyo.
5. To determine the difference in the means of BMI of overweight members between the Teaching staff and the Non-Teaching staff of the University of Uyo.
6. To determine the difference in the means of BMI of obese weight members between the Teaching staff and the Non-Teaching staff of the University of Uyo.

Research Hypotheses

1. There is no significant difference in the means of standing height (SHT) between the Teaching staff (TS) and the Non-Teaching staff (NTS) of the University of Uyo
2. There is no significant difference in the means of body weight (BWT) between the Teaching staff and the Non-Teaching staff of the University of Uyo
3. There is no significant difference in the means of Body Mass Index (BMI) between the Teaching staff and the Non-Teaching staff of the University of Uyo
4. There is no significant difference in the means of BMI of Ideal weight members between the Teaching staff and the Non-Teaching staff of the University of Uyo
5. There is no significant difference in the means of BMI of overweight members between the Teaching staff and the Non-Teaching staff of the University of Uyo
6. There is no significant difference in the means of BMI of obese weight members between the Teaching staff and the Non-Teaching staff of the University of Uyo.

Methodology

The area of the study was Akwa Ibom State; one of the 36 States in the Federal Republic of Nigeria; and particularly the University of Uyo community that is located in the humid tropic in Nigeria. The University is located in the South-South geo-political zone of the country. The community members are mostly Christians with different denominations and some Muslims; considered as in the public service sector. It is an academic environment established as practicing schools in 1930s; upgraded to Teachers Training College in 1940s; upgraded to Advanced Teachers' Training College in 1960s; upgraded to College of Education in 1975 and upgraded to a state University-University of Cross River State (UNICROSS) in 1983, and finally upgraded to a conventional University of Uyo as a Federal University in 1991. The University has 12 Faculties, Postgraduate school, School of Continuing Education and 85 Departments. The Community is situated within Latitude 4º 21' and 5º 35' North of Equator; and between Longitude 7º25' and 8º25' East of the Greenwich meridian (Akwa Ibom State bulletin, 2015). It is sited in Uyo, the State capital.

The expost facto survey design was used for the study. The design examined how an independent variable, present prior to the study, is associated with a dependent variable. The nature of this study suggested that the independent variables; height, weight, had already occurred and therefore no attempt was made to manipulate or

control them. The dependent variable (health risks) was measured against possible outcome of the independent variables.

The population of the Teaching staff and the Non-Teaching staff of the University of Uyo is 5,649 comprising 1,521 Teaching staff and 4,128 Non-Teaching staff. (University of Uyo, website, 2021). A sample size of 282 staffs that comprise 94 Teaching staff and 188 Non-Teaching staff representing five percent of the eligible population of 5,646 staff in the University of Uyo was selected and used in the study. The sample size was five percent of the population of the staff as guided by Borg and Gall (2003) and Gay (2011).who suggested that for a population of 5,000 and above, 5% to 10% could be used as sample size of a study.

In order to obtain a representative sample of 282 staff for the study, a multi stage random sampling procedure was adopted. In the first stage, seven Faculties were randomly selected from the twelve Faculties, School of Continuing Education and Postgraduate School that exist in the University of Uyo. The seven Faculties randomly selected were: Faculty of Education; Faculty of Sciences; Faculty of Arts; Faculty of Social Sciences; Faculty of Environmental Studies; Faculty of Engineering; and Faculty of Agriculture. These represent 50% of the total Faculties, Postgraduate school and School of Continuing Education in the University of Uyo. In the second stage, seven Departments from each of the seven Faculties randomly selected were randomly selected. This constitute 47 Departments in all was adopted in the study. In the third stage, two Teaching staff comprising one male and one female and four Non-Teaching staff comprising two males and two females was randomly selected from the Departments randomly taken for the study. The decision to choose four Non-Teaching staff and two Teaching staff was obtain from the ratio of 4,128 Non-Teaching staff and 1,521 Teaching staff from the overall population of the staff in the University of Uyo, i.e ratio of 4:2. Hence an overall sample size of 282 staff which comprise 188 Non-Teaching staff and 94 Teaching staff was drawn from seven Faculties for the study.

Being a design with measurements, standard instruments was used to measure the body weights and standing heights of the subjects as done by some notable authors (Oladapo, *et al*. 2010; NHCE, 2015; Ofori-Asenso *et al.,* 2016). The instruments were stadiometer made by Hiweight Technology Limited China which measured the height and weight of the subject. The instrument used for the study is already a standardized instrument. To ensure reliability of the stadiometer scale, a standard weight lifting barbell of 1 kg was always placed to set a scale-pointer correctly at 1kg. It was then removed and the pointer returned to 0 kg. Then the subjects were weighed. That was re-ascertained after the 5th subject was weighed. The instruments had been used by Adedoyin, et al., (2022); Chukwuonye, et al., (2013) and Sodjinou, et al., (2016) The z-test and t-test statistical analyses was used to analyze the hypotheses.

Results, Findings and Discussion of Findings

Testing the Hypotheses

Hypothesis 1: There is no significant difference in the means of standing height between the Teaching staff (TS) and the Non-Teaching staff (NTS) of the University of Uyo

Table 1: **Summary of z-test statistical analysis of mean difference in standing height between teaching staff and non-teaching staff**

Variables	N	$\bar{X}$	SD	Df	SE	z-cal	Decision
TS	94	166cm	54cm	280	0.71	4.2	H_0

NTS	188	163cm	59cm				Rejected

Significant at P≤ .05, df. 280 = 1.96 z-critical value

Result: In table 1, the z-calculated value of 4.2 is greater than the z-critical value of 1.96. Therefore the hypothesis that there is no significant difference in the mean of standing height between TS and NTS is rejected. TS were significantly taller than the NTS.

Hypothesis 2 : There is no significant difference in the means of body weight between the Teaching staff (TS) and the Non-Teaching staff (NTS) of the University of Uyo

Table 2: **Summary of z-test statistical analysis of mean difference in body weight between teaching staff and non-teaching staff**

Variables	N	$\bar{X}$	SD	Df	SE	z-cal	Decision
TS	94	80.6 kg	8.7kg	280	0.91	8	H_0
NTS	188	73.3 kg	6.8kg				Rejected

Significant at P≤ .05, df. 280 = 1.96 z-critical value

Result: In table 2, the z-calculated value of 8 is greater than the z-critical value of 1.96. Therefore the hypothesis that there is no significant difference in the means of body weight between TS and NTS is rejected. The TS were significantly heavier than the NTS.

Hypothesis 3: There is no significant difference in the mean of body mass index (BMI) between the Teaching staff (TS) and the Non-Teaching staff (NTS) of the University of Uyo

Table 3: **Summary of z-test statistical analysis of mean difference in body mass index between teaching staff and non-teaching staff**

Variables	N	$\bar{X}$	SD	Df	SE	z-cal	Decision
TS	94	29.1	3.5	280	0.42	3.6	H_0
NTS	188	27.6	3.2				Rejected

Significant at P≤ .05, df. 280 = 1.96 z-critical value

Result: In table 3, the z-calculated value 3.6 is greater than the z-critical value of 1.96. Therefore the hypothesis that there is no significant difference in the mean of BMI between TS and NTS is rejected. Therefore the TS significantly had higher mean of BMI than NTS

Hypothesis 4: There is no significant difference in the mean of BMI of ideal weight members between the Teaching staff (TS) and the Non-Teaching staff (NTS) of the University of Uyo

Table 4: **Summary of t-test statistical analysis of mean difference in body mass index of ideal weight members between teaching staff and non-teaching staff**

Variables	N	$\bar{X}$	SD	Df	SE	t-cal	Decision
TS	4	2	1.73	24	2	4.5	H_0
NTS	22	11	1.003				Rejected

Significant at P≤ .05, df. 24 = 2.064 t-critical value

Result: In table 4, the t-calculated value of 4.5 is greater than the t-critical value of 2.064. Therefore the hypothesis that there is no significant difference in the mean of BMI of ideal weight members between TS and NTS is rejected. Therefore there is a significant difference between TS and NTS in the mean of BMI of ideal weight members.

Hypothesis 5: There is no significant difference in the means of BMI of overweight members between the Teaching staff (TS) and the Non-Teaching staff (NTS) of the University of Uyo

Table 5: **Summary of z-test statistical analysis of mean difference in body mass index of overweight members between teaching staff and non-teaching staff**

Variables	N	$\bar{X}$	SD	Df	SE	z-cal	Decision
TS	54	27	1.12	176	0.18	194.4	H_0
NTS	124	62	1.32				Rejected

Significant at P≤ .05, df. 176 = 1.980 z-critical value

Result: In table 5, the z-calculated value of 194.4 is greater than the z-critical value of 1.980. Therefore the hypothesis that there is no significant difference in the mean of BMI of overweight members between TS and NTS is rejected. Therefore there is a significant difference as the TS had more BMI of overweight members than NTS on the average.

Hypothesis 6: There is no significant difference in the means of BMI of obese weight members between the Teaching staff (TS) and the Non-Teaching staff (NTS0 of the University of Uyo

Table 6: **Summary of z-test statistical analysis of mean difference in body mass index of obese weight members between teaching staff and non-teaching staff**

Variables	N	$\bar{X}$	SD	Df	SE	z-cal	Decision
TS	36	18	3.0	76	0.64	4.7	H_0
NTS	42	21	2.6				Rejected

Significant at P≤ .05, df. 76 = 1.980 z-critical value

Result: In table 6, the z-calculated value of 4.7 is greater than the z-critical value of 1.980. Therefore the hypothesis that there is no significant difference in the mean of BMI of obese weight members between TS and NTS is rejected. Therefore there is a significant difference in the mean of BMI of obese weight members as the TS had more obese weight members than the NTS.

Findings

The findings of the descriptive and statistical analysis are as follows:

Table 7: **Summary of the means of variables used in the study**

Variables	Mean of Teaching Staff (TS) (N = 94) $\bar{X}$	Mean of Non-Teaching Staff (NTS) (N = 188) $\bar{X}$	TS/NTS (N = 282)

Standing Height	1.66cm	1.63 cm	
Body Weight	80.6 kg	73.3 kg	
BMI	29.1	27.6	
BMI Health Implications			
(a) Underweight	0(0%)	0(0%)	0(0%)
(b) Ideal weight	4(4.3%)	22(11.7%)	26(9.21%)
(c) Overweight	54(57.4%)	124(66%)	178(63.1%)
(d) Obese weight	36(38.3%)	42(23.3%)	78(27.7%)

In table 7, are the various findings of the study and are presented below in details:

1. Teaching staff were significantly taller than the Non-Teaching staff on the average of 3cm.
2. Teaching staff were significantly heavier on the average than the Non-Teaching staff by 7.3kg.
3. Teaching staff were significantly higher in mean of BMI than the Non-Teaching staff by 6.5
4. Non-Teaching staff had greater rate of BMI of ideal weight members with 11.7% than the Teaching staff with 4.3% so there was a significant difference in the numbers of BMI of ideal weight between both groups. The total BMI of ideal weight members from the two groups was 9.2% rate.
5. Non-Teaching staff had greater rate of BMI of overweight (66%) than the Teaching staff (57.4%), so there was a significant difference in means of BMI of overweight members. The total BMI of overweight members from the two groups was 63.1% rate.
6. The Teaching staff had greater rate of BMI of obese weight members (38.3%) than the Non-Teaching staff with 22.3%. The total obese weight members from the two groups constituted 27.7% rate.

Discussion of Findings

The study was to assess the body weight and associated health risks of Teaching and Non-Teaching staff of the University of Uyo. The results and findings of the study are discussed as follows:

Difference in Standing Height between Teaching staff and Non-Teaching Staff

The study finding was that the Teaching staff members were significantly taller by 3cm on the average than the Non-Teaching staff. The Teaching staff had a mean standing height of 166cm while the Non-Teaching staff members had a mean standing height of 163cm. There is lack of information as to comparison of other University community to this study in terms of height difference between a Teaching staff and Non-Teaching staff. This study now set a trend for future studies. The study on a century of trends in adult human height by NCD-RisC, (2016) showed that Nigerian males have an average height of 165.9cm and the female have an average height of 157cm meaning that the mean height of the Teaching staff and the Non-Teaching staff were within acceptable height devoid of health risks due to over-height or under-height status. Therefore there were no associated health risk factors in height of staff members on the average.

Difference in Body Weight between the Teaching staff and the Non-Teaching staff

The study finding also showed that Teaching staff were significantly heavier than the Non-Teaching staff on the average by 7.3kg. The Teaching staff had a mean body weight of 80.6kg while the Non-Teaching staff had a mean body weight of 73.3kg. Teaching staff were significantly higher in height than the Non-Teaching staff. Normally, in biological sense, increase of height would attract increase in bone growth which is the third provider to extra weight in the human body after tissues and organs (Miles, 2007). Body weight and its associated health problems are closely from the level of overweight and obese weight. The condition of obesity is of concern to the health of the staff. The Teaching staff were 3803% and the Non-Teaching staff were 22.3% in the obese weight class. According to Alrashidi, (2016), there are common health conditions related to obesity that could affect those who are obese. These are type 2 diabetes when blood sugar is higher than normal. Other health problems are heart diseases that can lead to stroke as fat deposits may accumulate in the arteries that supply the heart with blood. Sleep apnea, a disorder in which someone may momentarily stop breathing during sleep as more fatty tissues have been stored around the neck making airways shrink. High blood pressure is associated with obesity where blood vessels restricted due to hardening of the walls of the blood vessels, thereby increasing blood pressure due to inelasticity of the walls of the arteries. Liver diseases are said to be develop due to accumulation of fats in the liver. Others are gallbladder, certain cancers, pregnancy complications and depression.

Difference in Body Mass Index (BMI) between the Teaching staff and the Non-Teaching staff

The two parameters of body height and body weight had produced the BMI in which the Teaching staff also significantly surpassed the Non-Teaching staff by a mean BMI difference of 6.5. The teaching staff had 29.1 while the Non-Teaching staff had 27.6. The BMI results showed that both Teaching staff and Non-Teaching staff were endomorphous generally as that had placed them into the overweight and obese weight classes by their average mean BMI statuses. The BMI does not measure body fat percentage. It is used extensively in the absence of standard equipment like skinfold caliper for measuring body fat percentage. The BMI becomes a useful tool to determine how thin, overweight and obese on is (WHO, 2023). Essentially the BMI put ones body weight into extremes ectomorphous and endomorphous classes. Definetly those below the ideal weight would be ectomorphous and those in the ideal weight are mesomorphous while those outside the underweight and ideal weight are endomorphous with overweight and obese body(WHO, 2016). It is of interest to note that both groups did not fall into the underweight class. This would have portrayed a nutritional deficiency.

Difference in Rate of BMI Ideal Weight, Overweight and Obese Weight members between the Teaching staff and the Non-Teaching staff and Associated Health Risks.

The BMI have the general acceptable standards that would place individuals into health risks classes. The study findings for the Teaching staff and Non-Teaching staff from the BMI results showed that only 4 of the Teaching staff were BMI ideal weight. This result is able to raise and alarm on the health statuses of the Teaching staff who were only 4 members with a rate of 4.3% only, while the Non-Teaching staff members were 22 with 11.7%. For both groups, the BMI ideal weight rate was 9.2% with 26 members only. It is because of this poor member of staff in the BMI ideal weight that revealed that the

Teaching staff had 54(57.4%) rates in the overweight class while the Non-Teaching staff had 124(66%). Though the Non-Teaching staff were significantly superior in number and the mean BMI in overweight members than the Teaching staff, the two groups had produced a rate of 63.1% (with 178 subjects) in overweight. Reversely the Teaching staff had more BMI obese weight members showing a rate of 38.3% with 36 members while their Non-Teaching staff counterparts obtained 22.3% with 42 members. This showed again that the Teaching staffs were more of BMI obese weight than the Non-Teaching staff, but both groups produced a rate of just 27.7% with 76 members out of the 282 sampled subjects. This is a very poor trend considering the fact that the World Health Organisation (WHO, 2012) had projected that a population with more than 25% rate of overweight and 15% of obesity rate needs to be considered overstepping the limit. Studies have related such results to many factors, though this study did not investigate the factors. These factors are lifestyles, dietary and nutritional status which may be affected by directly or indirectly by socio-economic status as the third factor (Dhurandhar, 2016).

There should be a cause for concern to the Teaching staff and the Non-Teaching staff respectively for these poor results because of the associated health risks from overweight and obese body. What these meant are that the Teaching staff and Non-Teaching staff are prone to certain illnesses like Diabetes, Atherosclerosis, High blood pressure, stroke, depression, snoring, poor mobility, back pain, cardio-respiratory problems and some forms of cancer have been associated with high endomorphous body weight. They need to look into their lifestyles concerning lack of physical exercises as recommended by various experts (Yusuf, *et al.* 2013; NHCE, 2015 and WHO, 2016).

Conclusion

The study finding justifies the conclusions that the Teaching staffs were more of obese weight in numbers while the Non-Teaching staffs were more of overweight in numbers. BMI values certified the higher obese weight nature of the Teaching staff and higher overweight nature of the Non-Teaching staff, which would indicate that staff were positively susceptible to the associated health risks of diabetes, cardiovascular diseases, high blood pressure, some form of cancers and postural disfigurements if they would not take steps to subject themselves back to the ideal weight class using

Recommendations

From the conclusions reached, the following recommendations were offered:

1. The staff should be informed of these findings about the potentiality of associated health risks to their overweight and obese body.
2. The staff by these findings should be enlighten to limit excessive intake of energy food; especially energy-dense foods such as those higher in fats and sugars; and by increasing the intake of dietary fibres and be committed to participating in well-organized physical exercise programmes that would burn down excessive fat and drain off cholesterol.
3. The staff should be enlightened to check their BMI measurement from time to time to ensure that they subject themselves to ideal weight class to avoid the associated health risks.
4. The staff club should be well organized to afford a better avenue for physical exercises for members while the Physical and Health Education Department should project physical exercise programme to the University community.
5. The staff by these findings should avail themselves of medical tests to ascertain their health statuses.

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