Overweight and obesity among staff of University of Calabar, Calabar, Nigeria

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Abstract

Introduction: *Physical inactivity is reported among 41% of Nigerians and 73.8% of adults in Calabar have been reported to be either overweight or obese. Obesity is a chronic disorder marked by excessive generalized deposition and storage of fat in human body. It is indicated by a Body Mass Index of 30kg/m^2 and above. The objective of this study was to determine the prevalence of overweight and obesity among the staff of the University of Calabar, Calabar, Nigeria.*

Methods: *A total of 321 staff in University of Calabar participated in this cross sectional study. A multi-stage sampling technique was employed to select faculties, departments, offices and respondents. Data was collected using a semi-structured and self administered questionnaire, a well calibrated weighing scale, a calculator and a checklist. Data analysis was done using IBM Statistical Package for Social Sciences version 20.0.*

Results: *Of the 321 respondents, 55.1% were males and 60.0% were non-teaching. One hundred and twenty nine (40.0%) of the staff were 31-40 years. A total of 43.6% had normal weight, 35.5% were overweight while 19.6% were obese. A total of 45.1% were estimated to be physically inactive and 24.0% did not intend to begin exercises within the next six months. Majority, 91.3% of respondents were knowledgeable about overweight/obesity and 60.4% correctly mentioned at least one possible health implication of overweight/obesity but only 24.3% could define overweight and obesity based on Body Mass Index and most staff (72.0%) believed they had normal weight.*

Conclusion: *The percentage of those found to be either overweight or obese is remarkable and the need to educate staff of the implication and ways to avoid over-nutrition. To avoid the increased risk of developing diabetes and cardiovascular diseases including communicable diseases, preventive health education and regular health checks for staff are recommended.*

Key words: *Obesity, Overweight, BMI, lifestyle*

Introduction

Overweight and obesity describe a condition of excess weight of an individual.[1] An overweight individual is one who weighs more than what is considered normal for his/her height, age, and sex.[2] For adults, it is indicated by a Body Mass Index (BMI) within the range of 25.00kg/m^2 - 29.99kg/m^2, and thus, is considered a precursor to obesity.[2,3] Obesity is a chronic disorder marked by excessive generalized deposition and storage of fat in human body.[4] It is indicated by a BMI of 30kg/m^2 and above.[3] Obesity, or adiposity as it is called in Latin,

is the abnormal growth of the adipose tissue in humans because of an increase in the sizes of fat cells (hypertrophic obesity) or an increase in the number of fat cells (hyperplastic obesity) or a combination of both.[5]

Although being overweight usually occurs as a direct result of obesity (National Heart, Lung and Blood Institute),[6] it could also be caused by other factors like abnormal muscle development, fluid retention, genetic influence and obesogenic environmental factors.[7] The regional distribution of fat differs in various individuals and it dictates the attributable risks or co-morbidities of obesity.[8] Android/apple-shape/central obesity which means adnominal fat distribution or excess fat in the trunk or nape of the neck, makes one more vulnerable to obesity-related chronic diseases compared to gynoid/pear-shape obesity that constitutes fat distribution around the gluteal region, hips and breasts.[9] Obesity is considered a chronic disease in and of itself and also leads to the onset and severity of so many different health problems.[10,11]

The first set of adverse effects of obesity that were observed in a population in transition are: hypertension, hyperlipidemia and glucose intolerance, while type-2 diabetes, endometrial, colon, breast and prostate cancers and coronary heart diseases emerged several years later.[5] Other health issues that are co-morbid with obesity (especially the visceral obesity) include: High serum cholesterol, low density lipoproteins, very low density triglycerides cancers (oesophagus, rectum, liver, gall bladder, pancreas and kidney) Non-Hodgkin's Lymphoma, multiple myeloma, increased rate of death, decreased life expectancy,[12,13] stroke, breathing disorders, sleep apnea,

gynecological problems (including infertility and irregular periods), erectile dysfunction (as well as sexual issues), osteoarthritis, depression, shame and guilt, social isolation and lower work achievement.[14]

Body Mass Index is a basic measuring tool for obesity in adults.[15] It is calculated as one's weight in kilograms (kg) divided by his/her height in meters squared (m^2).[16] Synchronizing with the publication of Park, a BMI within the range of $25.00kg/m^2$ - $29.99kg/m^2$ is considered overweight and a BMI of $30.00kg/m^2$ and above is considered obese.[3] Other tools for assessing body fat include the measurement of: skin fold thickness, Waist Circumference (WC), Waist-to-Hip Ratio (WHR), total body water, total body potassium, and body density.[17]

The primary cause of obesity is overeating and/or physical inactivity as well as a genetic predisposition to gaining weight.[18] Other secondary determinants include; hypothyroidism, Cushing's Syndrome, insulinoma, hypothalamic obesity, polycystic ovarian syndrome, genetic syndrome (Prader-Willi, Alstroms, Bardet-Biedl, Chens, Borjeson-forssman-lehmann and Frohlich Syndromes), growth hormone deficiency, oral contraceptive use, among others.[19] Globally, the combined prevalence of overweight and obesity has increased by 27.5% for adults and 47.15% for children between 1980 and 2013, thus, increasing the global number of overweight and obese individuals from 857 million in 1980 to 2.1 billion in 2013.[20] The prevalence of overweight individuals among adults in Nigeria ranged from 20.3% to 35.0% and a range of 8.1% to 22.0% of them were obese.[21] The lowest prevalence of overweight was seen in Ile-Ife (Osun State) with a percentage of 20.3% and the

highest prevalence of overweight was observed in Ilorin (a rate of 35.1%). The lowest prevalence of obesity was recorded in Maiduguri (8.1%) and the highest was in Lagos (22.1%).[21] One in every eight men in Nigeria is obese and two-thirds of urban, professional, high socio-economic status adults in Nigeria are either overweight or obese.[22,23]

Diets change whenever incomes rise in the developing world with a marked shift from cereals and tubers to meat, fat and sugar as well as vegetables.[24] In the developing world, obese adults have increased from 250 million to about a billion within the last three decades and South Africa typifies the alarming trend with nearly two-third of its population being overweight and 69.3% of the females being obese.[22] Apart from bariatric surgery (weight loss surgery), effective and non-surgical ways to lose weight or avoid weight regain involves the following; to eat fewer calories than the body requires, to exercise more often (300 minutes of quality exercise every week) and to change unhealthy or sedentary lifestyle/behaviour.[10]

Methods
The study area of this research is the University of Calabar, Calabar (UNICAL) established in 1975. The University of Calabar occupies a total of 17 hectares of land on the eastern side of the Calabar town, between the great Qua River and the Calabar River and lies on latitude 4.50^0 N and longitude 8.30^0 E respectively. Currently the University of Calabar has an estimated student population of 40,465 and the total number of staff of the university is 6026 while the total population of Calabar as at 2006 Census was 371,022 with projected figure of 483574 as at 2019.[25] The University consists of 10 faculties with various departments. A cross sectional descriptive study design was employed and the study was restricted to the staff of the University, which included the teaching and non-teaching staff. The sample size was 321 determined using Bluman's formula, n= Z^2pq/d^2 and increased by 19% to account for non-response bias.[26] For the purpose of this study, those staff found within the faculty and outside the faculty (such as Student Affairs Division, Registry, Library) were categorized as Group A and Group B respectively. Proportionate sampling was used to select respondents from Group A (3616 staff) and Group B (2410 staff) in the ratio 3:2 i.e. 192 respondents and 129 respondents respectively. Convenience sampling was employed to select all occupants in the selected offices. Only those present at the time of data collection were included in the study. The instruments for data collection included a Generic weighing scale, Generic 50m measuring tape rule, a check list and a semi-structured questionnaire. Data collected were entered into a spread sheet, and analyzed using Statistical Packages for Social Sciences (SPSS) version 20.0. Researchers were trained on research ethics and cleared by the Ethical Review Committee, Department of Public Health, University of Calabar. Verbal informed consents were obtained from the respondents.

Results
One hundred and seventy-seven (55.1%) participants were males and the highest age group (38.0%) was within 31-40 years (see Table 1). Majority (92.2%) of the respondents as shown in Table 1, had a tertiary level of education and a greater number of respondents (55.8%) were non-teaching staff. Majority (95.3%) of the respondents were Christians (see Table 1). Majority of the respondents (91.3%) had heard about overweight and obesity with only 43.9% who knew about BMI as

shown in Table 2. Only 24.0% of the 141 respondents who knew about BMI could correctly explain overweight as a BMI between the range of $25.0 - 29.9\,\text{kg/m}^2$ (see Table 2). Findings also showed that 24.6 correctly explained obesity as a BMI of $30.0\,\text{kg/m}^2$ and above while 62.6% had no knowledge about the BMI indication of obesity (see Table 2). Table 2 shows that one hundred and ninety four (60.4%) had knowledge on the health complications of overweight and obesity. Only 23.7% of the respondents ate more than three square meals daily, 29.3% had three square meals daily, 43.0% had two square meals daily and 4.0% ate only one square meal daily (see Table 3). Table 3 indicates that one hundred and twenty-three (38.3 %) had their breakfast always, 55.8% sometimes had their breakfast, while 5.9% rarely had their breakfast. Fifty two (16.2%) often

consumed bottles of beer/alcohol, 34% occasionally consumed bottles of beer/alcohol, 9% rarely consumed it and 40.8 had never consumed beer/alcohol. Ten respondents (3.1%) were current smokers, 34.3% had a family history of overweight/obesity, cardiovascular problems or diabetes or a combination of any while 65.7% do not have a family history of any. Four respondents (1.2%) were found to be underweight (see Table 3). Only 17.8% exercised regularly and had done so for more than six months (see Table 5). One hundred and sixty (49.8%) considered disability as a barrier to exercise while 4.4% considered safety as very much a barrier for them to do regular exercises (Table 5). Also 32.1% considered the limited availability of machines and tools for exercises as a strong barrier while 5.0% felt their age was

Table 1: Socio-demographic characteristics of respondents (n=321)

Variables	Freq.(%)
Sex	
Male	177(55.1)
Female	144(44.9)
Age (years)	
21-30	73(22.7)
31-40	122(38.0)
41-50	89(27.1)
51-60	33(10.3)
>60	6(1.9)
Education	
Primary	6(1.9)
Secondary	19(5.9)
Tertiary	296(92.2)
Employment	
Academic	142(44.2)
Non-teaching	179(55.8)
Religion	
Christianity	306(95.3)
Islam	15(4.7)

Table 2: Staff awareness of overweight, obesity, BMI (n=321)

Variables	Freq.(%)
Awareness of overweight and obesity	
Ever heard of overweight and obesity	293(91.3)
Never heard of overweight and obesity	28(8.7)
Awareness of BMI	
Ever heard of Body Mass Index (BMI)	141(43.9)
Never heard of Body Mass Index (BMI)	180(56.1)
Overweight indication based on BMI	
A BMI that is less than 25.0 kg/m^2	49(15.3)
between the range of 25.0 – 25.99 kg/m^2	77(24.0)
A BMI that of 30.0 kg/m^2 and above	37(11.5)
I don't know	158(49.2)
Obesity indication based on BMI	
A BMI less than 25.0 kg/m^2	19(5.9)
between the range of 25.0 – 25.99 kg/m^2	22(6.9)
A BMI that of 30.0 kg/m^2 and above	79(24.6)
Don't know	201(62.6)
Health implications of overweight	
Diabetes, cardiovascular diseases, arthritis	194(60.4)
None of the above	77(24.0)
Don't know	50(15.6)

Table 3: Determinants of overweight and obesity (n=321)

Variable	Freq. (%)
Daily average meal	
One square meal daily	13(4.0)
Two square meals daily	138(43.0)
Three square meals daily	94(29.3)
More than three square meals daily	76(23.7)
Takes Breakfast	
Always	123(38.3)
Sometimes	179(55.8)
Rarely	19(5.9)
Takes Beer/alcohol	
Yes, often	52(16.2)
Yes occasionally	109(34.0)
Yes, but rarely	29(9.0)
No, I have never consumed alcohol/beer	131(40.8)
Has Family history of overweight/obesity, cardiovascular problems, a rthritis	
Yes	110(34.3)
No	211(65.7)
Smokes Cigarette	
Yes, currently a smoker	10(3.1)
No, but I was once a smoker	66(20.6)
No, I have never been a smoker	245(76.3)

Table 4: Body mass index of respondents (n=321)

Variables	Freq. (%)
Perception of body weight	
Underweight	23(7.2)
Normal weight	232(72.3)
Overweight	42(13.1)
Obese	24(7.5)
Current Body Mass Index	
Less than 18.5 kg/m^2	4(1.2)
18.5 – 24.9 kg/m^2	140(43.6)
25.5 -29.9kg/m^2	114(35.5)
30.0 kg/m^2 and above	63(19.6)

Table 5. Contributory factors to physical inactivity/lack of exercises (n=321)

Variables	Freq. (%)
Regularity of exercising	
Did not exerc ise at all but intend to begin shortly	77(24.0)
Did not exercise at all and did not intend to	68(21.1)
Exercised though not regularly	119(37. 1)
Exercised regularly	57(17.8)
Duration of exercises weekly	
Less than 30 minutes	103(32.0)
30 – 60 minutes	41(12.7)
More than one hour	32(10.0)
Did not exercise at all	145(45.3)
Disability, a barrier to adequate exercising	
Not a ba rrier	210(65.4)
Somewhat a barrier	41(12.8)
Very much a barrier	70(21.8)
Lack of time, a barrier to adequate exercises	
Not a barrier	109(34.0)
Somewhat a barrier	160(49.8)
Very much a barrier	52(16.2)
Unavailability of machines for exercises, a barrier to adequate exercising	
Not a barrier	123(38.3)
Somewhat a barrier	92(28.7)
Very much a barrier	103(32.1)
Age, a barrier to adequate exercising	
Not a barrier	262(81.6)
Somewhat a barrier	43(13.4)
Very much a barrier	16(5.0)

a barrier as shown in Table 5.

Discussion

The results of this study showed that the respondents had only a superficial knowledge on overweight and obesity as majority of them were not able to identify the indications of overweight and obesity using BMI which is the most recognized and standardized tool. The results also showed that the concept of benign obesity is rampant among the respondents as the majority of them considered their weights as being normal even when they were quite high based on objective measurements by the researcher. The concept is most probably due to culture and peer misperception. The results of this study is in congruence with similar study in France, where 79% of general practitioners agreed that weight loss or maintenance, as the case may be, is a duty to be held by everyone but 57% of them were pessimistic about patient's ability to lose weight.[27] The respondents had a good knowledge on the possible health implications of being overweight or obese, as the majority of them pointed out diabetes, cardiovascular problems and arthritis as possible health problems

attributable to overweight and obesity. This is in agreement with the finding in a study among Hispanic adults, where the majority of the participants were knowledgeable of the risk of hypertension (94%), diabetes (96%), and joint pains/arthritis (89%) associated with overweight and obesity.[28]

This study showed that a good number of the respondents (23.7%) ate more than three square meals daily. This is overeating and could lead to food addiction, consumption of large portion sizes, and sugar laden foods and consequently, overweight and obesity is very imminent. This report is in tandem with a similar study that showed that excessive consumption of unhealthy fatty foods and sugar-filled soft drinks and beverages provided unnecessary source of calories with little or no nutritional value to their participants.[29] This study also showed that 61.7% of the respondents often neglected their breakfast and this could consequently lead to overweight and obesity as they tend to resort to snacks and soft drinks of fast foods. This report is in agreement with a study that established that skipping breakfast, increases one's risk of obesity or makes it difficult to lose weight, as it may trigger bad eating habits throughout the day, and as cravings ensue, quick fix fast foods are often sought for.[30] Furthermore, he explained that eating breakfast boosts one's metabolism and failure to eat breakfast reduces body metabolism and physical activity levels decline. The study is also in congruence with another study that found that eating fast food three times/week increases the risk of obesity by 33% in their respondents.[31]

This study found that a good number of the respondents consumed alcohol occasionally (34%) and some very often (16.2%). Similar studies have shown that drinking alcohol in excess lead to more calorie consumption and that alcohol takes longer time to metabolize completely. This temporarily inhibits lipid oxidation, thus, as long as alcohol remains in one's body system it is harder to burn fat that pre-existed and every other glucose or fat consumed keeps accumulating until the alcohol is fully metabolized and used up.[32,33] A good number of the respondents (33.4%) have family history of either overweight/obesity, cardiovascular problems or arthritis, and that points to the fact that it may have been genetically inherited. This is agrees with a study that showed that, "a person is more likely to develop obesity if one or both his/her parents are obese", and he added that genetics affect hormones that are responsible for appetite regulation in human.[34] From this study, it is seen that 35.5% of respondents were overweight, and 19.6 % were obese, thus, 55.1% of the staff were either overweight or obese. Another study in Calabar had shown also a higher prevalence of 73.8%.[35]

Conclusion

The study showed that a low percentage of the staff knew what overweight/obesity is and the standard method of measuring weight. A remarkable percentage of the staff was found to be either overweight or obese. The study also showed that most respondents (45.1%) did not exercise regularly and those that exercised (32%) did so inadequately. A reasonable percentage (23.7%) had improper eating and drinking habits. University staff would require regular health education on healthy life style and implications of overweight/obesity to avoid the health implications.

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