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Lifestyles patterns and Anthropometric Indices of Healthcare Staff in Jos University Teaching Hospital, Jos, Nigeria

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Abstract

Background: Excessive weight gain, obesity and poor lifestyles are some of the predisposing factors to the burden of non-communicable diseases (NCDs) especially among in Africa continent and other region of the world. **Objectives:** This study assessed the lifestyles patterns and Anthropometric indices of staff in Jos University Teaching Hospital, Jos, Nigeria. **Methods:** It was descriptive cross-sectional study which involved 283 staffs who were randomly selected from all the department in the hospital Information were sourced from participants on medical history, dietary habits and lifestyles patterns using a structured, self-administered questionnaire and anthropometric indices. Data were analyzed using descriptive statistics and chi-square. In all cases, a probability of (<0.05) were taken to indicates level of significance. **Results:** More than half (64.3%) of the respondents were within the age of 30-49 years. More (68%) female health workers participated in the study than male workers (32%). More half of the respondents (56.2%) had parents that were suffering chronic diseases. Only (21.6%) of the respondents drink alcohol, 2.5% smoke cigarette, 65% did not engage in physical exercise. Large number (86.2%) of the respondents always adds vegetables to their diet and 39.1% took fruit regularly while about 56.2% of the respondent's parents had chronic diseases. Prevalence of Overweight/Obesity as determined by abnormal values for BMI, WC, WHR and BIA were 48.9%, 31.1%, 43.1% and 65% respectively. **Conclusion:** This study observed a high level of abnormal body weight status and low consumption of fruits among the hospital staff.

Key words: Overweight/obesity, Hospital staff, Alcohol, Cigarette, Fruits.

INTRODUCTION

Poor anthropometric status such as body mass index above 30 kg/m^{-2} has been identified as one of the most notable factors for the development of hypertension.[1,2] Over time and across different regions of the world, a number of researchers have investigated the relationship between obesity and high blood pressure and found the association to be strong, though there has been a varied conclusion as to which methods of assessing obesity show a stronger association.[3] Studies in various regions of Nigeria have also shown that obesity indices are strongly associated with hypertension.[4,5] The use of Waist-Hip-Ratio (WHR) as an indicator of health and the risk of developing serious chronic non-communicable diseases has been established.[6] For instance, the WHO steps states that abdominal obesity is defined as a waist hip ration above 0.9 for male and 0.85 for female or BMI above 30kg/m^2.[6] Men with waist-hip-ratio around 0.9 had been shown to be healthier and fertile with lesser risk of prostate cancer and testicular cancer[1,6] same with while women whose WHR woven around 0.7 range have optimal level of estrogens and shown less susceptible to cardio-metabolic diseases.[2,6,7]

With the high prevalence obesity, it is now well known as a disease in its own and which is largely preventable through changes in life style, this fact, together with its association with the leading causes of illness and death, has made obesity a high priority problem not only in the developed countries also in developing nations.[8,9] The unfolding population epidemic reflects the profound changes in the society and on the behavioral patterns of communities this has recently resulted in dramatic changes in risk over relatively short periods of time.[10] As research progresses, it is becoming clear that the relationship between biological and environmental risk is not a simple one and that further study of phenotypes predicting obesity risk may be important to further explained the nature of risk and how to provide solution.[11,12] The prevalence of obesity is increasing worldwide and it has been identified as a major risk factor contributing to the overall burden of disease worldwide.[12] This trend of emerging obesity in Nigeria population is seen more not just in urban dwellers,[4,12] also among women[5,12] and a strong

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contributed to the increasing prevalence of non-communicable diseases that include heart disease, type 2 diabetes, hypertension, stroke and cancers along the spectrum of life. In spite of the recognition of obesity as a risk factor for non-communicable disease, it has been observed that understanding about multiple factors influencing a person`s risk is still inadequate.[13] The detrimental effect of sedentary lifestyle on cardio-metabolic diseases could be linked to urbanization, modernization, economic growth as well as globalization of food.[14-16] To have an insight regarding people's perception, in relation to obesity, qualitative studies also have been conducted.[17,18]

This trend of emerging obesity in Nigeria population is seen more not just in urban dwellers but also among health workers.[19,20] Therefore, this study aimed at investigating the Lifestyles patterns and Anthropometric indices of staff in Jos University Teaching Hospital, Jos, Nigeria.

METHODS

Study Design: The study was a descriptive cross-sectional in design.

Study settings: Jos is a city in the north central of Nigeria.[21] It is the administrative capital of plateau state. The city is located on the Jos Plateau at an elevation of about 1,238m or 4,062ft high above sea level.[21] The city is divided into 3 local government areas of Jos north, Jos south and Jos east. The research was conducted at the Jos University Teaching Hospital, an over 550 beds space and the largest of 3 tertiary health care facilities in Jos metropolis, the leading urban Federal Tertiary Hospital in North-Central Nigeria. Jos University Teaching Hospital, (JUTH), as one of the oldest tertiary health institutions in the north central part of the country. It is said that the hospital have more than half of the doctors in the entire North central region. It offers various services such as research, teaching, consultation and clinical services. Health service providers account for over 1000 with non-clinical staff strength of 500.

Study Population: Apparently healthy clinical and non-clinical staffs of the Jos University Teaching Hospital (JUTH) were recruited for the study. A total of 283 respondents of which 106 were clinical staff while 177 made up of non-clinical staff.

Sample size: The sample size was calculated using the formula for descriptive studies.[22]

$$n = \frac{Z^2_{1-\alpha/2} P(1-P)}{d^2}$$

Sampling Procedure: Multistage sampling method was used in selection of the departments for the study in the hospital. Fourteen[14] departments were randomly selected from a total of 28 departments that existed in the hospital. Seven[7] clinical and Seven[7] non-clinical departments were involved in the study. Systematic sampling procedure was adopted in selection of staffs for the study.

Ethical Consideration: Prior to the survey, permission was obtained from Nutrition and Dietetics Department of Wesley University, Ondo. Ethical approval was sought and obtained for the study from the Ethic committee of the Jos University Teaching Hospital; Jos. Oral consent from the participants was obtained after the objective of the study was explained to them.

Data collection: Self-administered questionnaires were used to obtain data. The questionnaire contains information on medical history, lifestyle and dietary habits of the respondents.

Anthropometric measurements

Weight and Height measurement: The weight of the subjects were measured using a portable bathroom scale (HANSON model), to the nearest 0.1kg with the subjects standing upright on the scale barefooted at shoulder level, arms by the side and the head straight in line with using standard methods.[23,24] The height of the participants were measured by Standiometer with the subject standing erect and barefoot on the height meter with back to the height meter and looking straight in a Frankfurt position. The height was taken and recorded to the nearest 0.1cm.[23,24]

Waist and Hip Circumferences measurement: Waist circumference measurement was taken using in line with the WHO protocol using a non-stretch tape measure (Butterfly, China) the tape rule was placed at the midway between the lower rib margin and iliac crest. Measurements were taken and recorded to the nearest 0.1cm.[23,25] Hip Circumference measurement was taken by placing the tape horizontal plane around the hip at the point of the greatest circumference with the measurement taken to the nearest 0.1cm.[23,25]

Body Fat Measurement: Body fat % was measured with a BIA device (Omron BF-212, Omron Healthcare Europe BV, Hoofdorp and The Netherlands) following the manufacturer's instructions. The procedure body fat analysis was in line with a method described by Chukwunonso and Ifeoma.[26]

Data analysis: Truncal obesity was determined with Waist –Hip- Ratio (WHR) and waist circumference (WC). Waist –Hip- Ratio (WHR) was calculated by dividing the waist circumference by the hip circumference. Abnormal WHR and WC for females and males were classified in line with World Health Organization, 23 Body mass index was calculated using the formula BMI (kg/m^2) =.[24] Body Mass Index was classified according to the WHO, (24,25) and percentage body fat≥32.0% (overweight) and ≥37.1% (obese) in black females and ≥21.7% (overweight) and ≥28.3% (obese) in black males.[27] Statistical Analysis: Statistical analysis was performed using the statistical package for social science (SPSS version 20). Descriptive statistics such as frequencies, percentages, mean and standard deviation were used to analyze medical history, dietary habits and lifestyle habits of the subjects and all anthropometric data. For the inferential statistics, t-test was used to determine the mean differences and Chi-square and correlation were employed to determine the relationship. Level of significance was set at $p<0.05$.

RESULTS

Medical History of the Respondents

The Table 1 presents the medical history of the respondents. More half of the respondents (56.2%) had parents that were suffering chronic diseases. Only (29.7%) of the respondents' parents were either father or grandfather and 26.5% either mother or grandmother. Large number (89.7%) of the respondents was without any disease as at the time of the study.

Dietary Habits of the Respondents

Table 2 shows the dietary habits of the respondents. A total of 85(30.0%) of the participants eat there dinner between the hours of 5-6pm, 17.3% between the hours of 6-7pm. 18.3% of the respondents don't have a usual time for dinner consumption while 4.3% ate dinner above 8pm. There was high prevalence of vegetables consumption among the participants. 86.2% of the subjects of which 60.1% were female participants while 26.1% were male respondents. Only 14.5% of the subjects hardly take vegetables. There was low prevalence of fruits consumption among the subjects. 39.6% of

the respondents subscribe to fruit intake, cucumber being the best of the majority choice.

Lifestyle History of the Respondents

Twenty-one percent (21.6%) of the respondents drink alcohol, of which 10.2% of these had been drinking for about 5years ago. Majority of the drinkers (11.3%) usually drinks 1-2bottles daily. Very few of (2.5%) did smoke cigarette. More than half (55.1%) of the respondents were not involved in physical exercise. Only 44.9% of respondents did engage in physical exercise, of which 40.0% of them practiced low intense exercise (Table 3).

Nutritional status of the Respondents

Nutritional status of the respondents is presented on Table 4. This study found that only (3.5%) of the entire study population were underweight, nearly half (47.0%) were within the healthful BMI range while a great proportion of the participants about (37.5%) were found to be overweight while about (12.1%) were however battling with obesity. Female participants were more obese but not statistically significant ($p<0.05$). Anthropometric status of the respondents has revealed by waist- hip ratio shows that about (56.8%) of the entire study population had normal WHR while (43.2%) were found to have a high fat accumulation. The prevalence of central obesity was higher among female respondents about (29.7%) compare to their males counterpart (1.4%) and it was statistically significant ($p<0.05$), while (31.1%) of the participants had normal waist circumference according to WHO classification. Likewise the prevalence of overweight and obese respondents using %body fat, shows a significant difference male and female participants ($p<0.05$), (3.9% vs 19.1% and 18.0% vs 30.4%) were overweight and obese respectively. Judging with percentage of body fat, only 18.7% of the entire participants were fit and had normal body fat.

DISCUSSION

A healthy lifestyle is known to include nutrition, adequate physical activity and avoidance of tobacco abuse. Having two-third (63.2%) of the respondents in this study ate their dinner between the hours of 4-7pm shows that many medical staff eats their dinner early. This habit can be a result of the knowledge some of the staff have acquired on the negative effects of eating late in the evening such as late dinner meal complicates glucose management and prevent proper night sleep.[28] The percentage of the respondents that ate fruits (39.6%) was very low when compared to numerous health and protective benefits which can be supplied from fruit consumption. This low intake of fruits observed among the participants in this study was also observed among teachers in study conducted by[29] where 31.2% of the study population regularly consumed fruits. This suggests that many of the health workers are suffering from the micronutrient deficiency. Studies have shown that the consumption of fruits does not only form a formidable parts of the diet, it is associated with a lowered risk of degenerative disease such as obesity, cancer, cardiovascular diseases, cataract, brain and immune dysfunction.[24,29] It is idea that an individual add at least 5 portions of fruits and vegetables to their diet every day, legumes such as lentils and beans, nuts and whole grains should also be included in the diet of an individual who practices healthy eating.[30] Vegetables consumption was very high (86.2%), this could be that vegetables formed a formidable soup and sauce ingredient for an average Nigerian household.[28] And the fact that Jos city is known for high farming of both and foreign vegetables due to the weather condition of the city which favour the growth many vegetables and this make vegetable available through the year this could also be responsible for the high consumption of vegetables seen among the study population. Fruits and vegetables are good source of vitamins, minerals and dietary fibre which have been known to improve health and prevent chronic non communicable disease in adulthood, such as increased impairment of glucose associated with ageing.[31]

The result of this study reveals that more than two- third (78.4%) of the staff had not drinks alcohol in the past one year and only about 21.6% were drinkers. This low rate of alcohol consumption seen in this study may be attributed to the knowledge gained on negative consequences of excess alcohol consumption. Alcohol abuse is responsible for occupational and other health consequences that make their consumer vulnerable to developing

Table 1: Medical History of the Respondents.

MEDICAL HISTORY	Male (*n*=91) (%)	Female *n*=192(%)	Total (*n*=283) (%)	X^2	*P* value
Parents with Chronic Diseases					
Yes	43(15.2)	116(41.0)	159(56.2)	4.346	0.037*
No	48(17.0)	76(26.8)	124(43.8)		
Parents with chronic disease					
Father/Grandfather Mother/	21(7.4)	63(22.3)	84(29.7)	4.687	0.096
grandmother	22(7.8)	53(18.7)	75(26.5)		
None of the two	48(17.0)	76(26.8)	124(43.8)		
Current Diseased Conditions of the respondents					
None	85(30.0)	169(59.7)	254(89.7)	14.156	0.168
Arthritis	1(0.4)	2(0.7)	3(1.1)		
Ear impairment	0(0.0)	1(0.4)	1(0.4)		
obesity	0(0.0)	1(0.4)	1(0.4)		
Migraine	0(0.0)	1(0.4)	1(0.4)		
Postnatal HBP	2(0.7)	5(1.8)	7(2.5)		
Ulcer	0(0.0)	3(1.1)	3(1.1)		
HB cholesterol	0(0.0)	6(2.1)	6(2.1)		
HBP/Rhino sinusitis	1(0.4)	0(0.0)	1(0.4)		
Diabetes	0(0.0)	4(1.4)	4(1.4)		
HIV	2(0.7)	0(0.0)	2(0.7)		

*Significant at $p < 0.05$)

psychological distress.[32,33] Similar study had been reported among health workers in Ekiti state university teaching hospital.[15] It was reported that majority (75.0%) of the health professional in the hospital were abstainers while 25% drinks alcohol. Excessive alcohol intake is associated too weight and obesity which are risk factors of high blood pressure.[34] Generally, it's believe that females drink less than men, but in this study, alcohol use was the more seen of among female staff. Studies have found an association between sex, chronic cardio-metabolic illness like hypertension, diabetes and harmful alcohol use.[34,35]

The rates of Overweight/Obesity as determined by abnormal values for Body Mass Index (BMI), Waist Circumference (WC), Waist-Hip Ratio (WHR), Waist-to-height ratio (WHtR) and percentage Body Fat (BF) were 48.9%, 31.1%, 43.1%, 65% and 71.4% respectively. All these measurements confirm the presence of double burden of malnutrition among the staff in the study location. The highest rate of Overweight/Obesity was observed with BMI and BF while the lowest was observed with WC method. Difference in the rates of Overweight /Obesity using these methods have been reported.[36] Findings in this study of highest Overweight/Obesity prevalence with BMI and BF method seem to contradict reports that have identified WC as a more effective's method. Overweight and obesity are the fifth leading risk for global death. At least 2.8million adults died each year as a result of being overweight or obese.[37] The prevalence of overweight and obesity (37.5% vs. 11.4%) in this study respectively was lower than similar study reported (44.7vs 27.3%) by Sandra *et al*.[38] in Lagos. However, the prevalence of overweight/obese (48.9%) in this study was lower than what (72.0%) was reported by Sandra *et al*.[38] from tertiary hospitals in Lagos. Though the obesity rates defined by the five methods vary, two of the parameters confirm that more than half of the study population is overweight and obese; this reveals a high rate of overweight and obesity in the population. A contributing factor to overweight/Obesity may be attributed to the fact that the study location is urban where there is high intake of western diet and change in local dietary patterns due to urbanization are common.[37-41]

Central obesity (31.1%) was lower than what (49.7%) was reported among health workers tertiary hospital in Lagos.[42] The presence of central obesity as determined using waist circumference was significantly higher (29.7%) among the female staff than their male staff. This shows that the female respondents in the study location are more at risk of metabolic syndrome than the male counterpart ($p<0.05$). Excess abdominal fat is an independent risk factor for non-communicable disease (NCDs). It has been reported that women with have waist circumference ≥88cm are at higher risk of developing hypertension, diabetes, elevated cholesterol levels and cardiovascular diseases.[37,43] The high rates of obesity among the health

Table 2: Dietary Habits of the Respondents.

Dietary Habits	Male *n*=91 (%)	Female *n*=192(%)	Total *n*=283(%)	X^2	*P* value
Time for Taking Dinner					
4-5 pm	17(6.0)	28(9.9)	45(15.9)	5.889	0.317
5-6 pm	27(9.5)	58(20.5)	85(30.0)		
6-7 pm	10(3.5)	39(13.8)	49(17.3)		
7-8 pm	11(3.9)	28(9.9)	39(13.8)		
Above 8 pm	5(1.8)	7(2.5)	12(4.3)		
No usual time	21(7.4)	32(11.3)	53(18.7)		
Desire for Vegetables					
Yes	74(26.1)	170(60.1)	244(86.2)	2.711	0.100
No	17(6.0)	22(7.8)	39(13.8)		
Duration of Time for taking vegetables per week					
One day	13(4.6)	24(8.5)	37(13.1)	12.985	0.011*
2-3 days	43(15.2)	87(30.7)	130(45.9)		
4-6 days	14(4.9)	24(8.5)	38(13.4)		
Everyday	3(2.1)	34(12.0)	37(14.1)		
None	18(6.4)	23(8.1)	41(14.5)		
Daily Intake of Fruits					
Yes	33(11.7)	79(27.9)	112(39.6)	0.615	0.433
No	58(20.5)	113(39.9)	171(60.4)		
Fruit Intake in the last one Month					
Cucumber	42(14.8)	101(35.7)	143(50.5)	12.679	0.048*
Watermelon	25(8.8)	34(12.0)	59(20.8)		
Orange	10(3.5)	28(9.9)	38(13.4)		
Garden egg	4(1.4)	19(6.7)	23(8.1)		
Apple	4(1.4)	1(0.4)	5(1.8)		
None	6(2.1)	9(3.2)	15(5.3)		

*Significant at $p < 0.05$

workers in developing countries like Nigeria will reduce productivity and chances of early retirement.[44]

Considering the waist- hip ratio of the respondents, it was observed that some of them (43.2%) have visceral fat. The waist- hip ratio is thought to be a good measure of abdominal adiposity because of the distinct physiologic characteristics of different fat depots. Abdominal adiposity was more significant among the female respondents. Visceral fat has a lower threshold for lipolysis relative to subcutaneous fat and free-fatty acids released by the liver. In this way, their metabolic consequences could be accentuated.[45] Higher subcutaneous fat has been associated with metabolic benefits in older persons.[46,47] Similarly, %body fat was significantly higher in the females compare to the males in this study. This result agrees with earlier studies conducted by.[26] A total of 71.4% of the respondents were overweight/obese using the %body fat parameter. Percentage body fat estimates the total fat content of the entire body unlike body mass index and waist-hip ratio.

Table 3: Lifestyle of the Respondents.

Lifestyle		Female (*n*=192) n(%)	Total (*n*=283) n(%)	X^2	*P* value
Alcohol Intake					
Yes No	13(4.6) 78(27.6)	48(17.0) 144(50.9)	61(21.6) 222(78.5)	4.192	0.041*
Drinking Duration					
Non-drinker < 1 year 1-5years >5years	78(27.6) 02(0.7) 10(3.5) 10(3.5)	144(50.9) 14(4.9) 19(6.7) 16(5.7)	222(78.5) 16(5.6) 29(10.2) 26(9.2)	8.731	0.033*
Types of Alcoholic Drink					
Non-drink Local drink Whisky/beer/gin Others	78(27.6) 16(5.7) 14(4.9) 06(2.1)	144(50.9) 9(3.1) 8(2.8) 8(2.8)	222(78.5) 25(8.8) 22(7.7) 14(4.9)	8.088	0.044*
Smoking of cigarette					
Yes No	3(1.1) 88(31.1)	4(1.4) 188(66.4)	7(2.5) 276(97.5)	2.734	0.539
Engaging in physical exercise Yes No	 40(14.1) 51(18.0)	 87(30.7) 105(37.1)	 127(44.8) 156(55.1)	0.046	0.083
Type of Physical exercise Low intensity High intensity None	 36(12.7) 4(1.4) 51(18.0)	 77(27.2) 10(3.5) 105(37.1)	 113(40.0) 14(4.9) 156(55.1)	0.108	0.948

*Significant at $p < 0.05$)

Table 4: Nutritional Status of the Respondents.

Anthropometrics parameters	Male (*n*=91) (%)	Female *n*=192) (%)	Total (*n*=283) (%)	X^2	*P* value
Body Mass Index					
<18.5 (underweight)	3(1.1)	7(2.5)	10(3.5)	2.923	0.712
18.5 – 24.9 (Normal)	45(15.9)	88(31.1)	133(47.0)		
25-29.9 (Overweight)	33(11.7)	73(25.8)	106(37.5)		
30-34.9 (Obesity class1)	9(3.2)	15(5.3)	24(8.5)		
35-39.9 (Obesity class 2)	1(0.4)	7(2.5)	8(2.9)		
Waist circumference					
<88cm<102cm(Normal) >88cm >102cm(Excess)	87(30.7) 4(1.4)	108(38.2) 84(29.7)	195(68.9) 88(31.1)	44.995	0.000*
Waist-Hip Ratio					
<0.85<0.90(Normal) ≥0.85≥0.90 (Excess)	74(26.1) 17(6.0)	87(30.7) 105(37.1)	161(56.8) 122(43.1)	315.7	0.000*
%Body fat					
Fitness Overweight Obesity	28(9.9) 11(3.9) 51(18.0)	53(18.7) 54(19.1) 86(30.4)	81(28.6) 65(23.0) 137(48.4)	8.979	0.012*

*Significant at $p < 0.05$)

CONCLUSION

This study found a high number of the hospital staff to be overweight and obese. Despite the relatively easy access to health care and assumption that the health workers should be aware of what it takes to stay healthy, weight management was very poor. The study shows a higher prevalence of obesity among the female staff than their male staff. Many of the workers were physical inactive. There was inadequate intake of fruits among the health workers suggesting that many of the health workers may be suffering from micronutrient deficiency which is associated with various chronic diseases.

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CONFLICT OF INTEREST

The authors declare no conflicts of interest. The design, data collection, writing and funding of this study are the sole responsibility of the authors.

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