ORIGINAL ARTICLE

Pattern of obesity among chief executives of public and private organizations in Jos, Plateau state, Nigeria

Mathilda Edmund Banwat, Moses Peter Chingle, Luret Albert Lar, Nantok Dami, Ayuba Ibrahim Zoakah

Department of Community Medicine, Faculty of Medical Sciences, University of Jos, Jos

ABSTRACT

Background: Obesity and overweight are known to be associated with other non-communicable diseases (NCD). In recent times, there has been an increase in the prevalence of this health-related condition, not only in the developed but also in developing countries. This study set out to assess the prevalence and factors associated with this health condition among chief executives of private and public organizations in Jos metropolis. **Materials and Methods:** A total of 250 chief executives of public and private institutions in Jos north local government area (LGA) of Plateau State were selected using a multi-stage sampling technique and data was collected from them using interviewer-administered, structured questionnaires. The data were analyzed using Epi Info statistical software (version 3.5.3). **Results:** The ages of the respondents ranged between 27 and 68 years with a mean of 44 + 2 years. Majority of the respondents (68%) were males. The prevalence of obesity was found to be 38% while 48.8% of subjects were overweight. BMI of subjects had a statistically significant relationship with sex and income of respondents but not with exercise. There was a fair knowledge of obesity, its contributory factors, and complications among the respondents (63.6%). **Conclusion:** The prevalence of obesity and overweight were found to be high among the studied executives, despite their fair knowledge of the disease and its complications. The increasing prevalence of obesity among chief executives of organizations needs to be addressed by increased health education. Managements of organizations should insist on periodic medical check-ups for their executives.

Key Words: Chief executives, obesity, overweight, prevalence

INTRODUCTION

The adverse effects of malnutrition constitute some of the greatest threats to global health in the 21st century.[1] The prevalence of obesity is increasing globally, resulting in a disproportionate co-existence of both under- and over-nutrition in developing countries.[2] Obesity and overweight can affect the rich as well as the poor; this is because they result from factors (like financial and geographical access) which affect the marketing of food items. 'Restrictions in access to food determine two simultaneous phenomena,

which are two sides of the same coin: Poor people are undernourished because they do not have enough to feed themselves with; they are obese because they eat poorly with an energy imbalance. The food they can afford is often cheap, industrialized, mass-produced, and inexpensive'.[1]

Middle and low-income countries in recent times have been facing a double burden of diseases: While still battling with the high prevalence of infectious diseases and under nutrition, there is a rapidly increasing surge of chronic non-communicable diseases (NCDs) with increased tendency for obesity and overweight, particularly

Address for correspondence: Dr. Mathilda E. Banwat, Department of Community Medicine, Jos University Teaching Hospital, PMB 2076, Jos. E-mail: mathildabanwat@yahoo.com

among urban dwellers.[1] It is becoming increasingly common to find both under-nutrition and over-nutrition co-existing within the same country, community and even within the same household. The major factors contributing to the increase in over-nutritional states in developing countries include inadequate prenatal, infant and young child nutrition, increasing exposure to high fat, energy-dense, micronutrient-poor foods as well as lack of physical exercise.[3]

Obesity is gradually gaining recognition as a chronic medical condition requiring long-term and even life-long measures to achieve improved health outcomes. This health condition has been assessed to be a leading preventable cause of death worldwide, with increasing incidence in both adults and children and, therefore, constituting a public health problem.[4] The World Health Organization (WHO) global estimates for 2008 stated that 1.5 billion adults (aged 20 years and above) were at least overweight; of these, about 200 million men and 300 million women were obese. This shows that about 1 in 10 of the world's adults is obese.[1] It was projected that by the year 2015, approximately 2.3 billion adults will be overweight while 700 million will be obese.[1] A study done among the adult general population in northern Nigeria showed a prevalence of 13.1%[4] while a similar one done among adults in Jos metropolis showed a prevalence of 4.5% in females and 4% among male subjects.[4]

The job description of chief executives of organizations require that they sit for long stretches of time; holding meetings, assessing documents, discussing with management and workers and so on. This sedentary lifestyle increases their risk of over nutrition and obesity as they fail to 'burn out' a good portion of their energy intake. In addition, their diets are majorly made up of calorie dense and micro-nutrient-free 'fast foods,' which supply energy they mostly store up as fat and muscle bulk due to their reduced physical activity. This study, therefore, set out to assess the prevalence of overweight and obesity as well as their associated factors among chief executives of private and public organizations in Jos North LGA of Plateau State, Nigeria.

MATERIALS AND METHODS

Study area
This study was conducted in Jos North LGA of Plateau State. The LGA is bounded by the following LGAs: Bassa (Plateau State) and Toro (Bauchi State) to the North, Jos East (Plateau State) to the East, and Jos South (Plateau State) to the south. Its 2012 projected population is 3,749,843 people while it covers an area of about 291 km². [5] It is the Plateau State capital

and is home to indigenous Berom, Anarguta, Irigwe, and Jarawa tribes. However, being the commercial nerve-center of the state, many Nigerian tribes (as well as expatriates) are well represented in its population. It is majorly an urban and sub-urban area with available (though erratic) supply of social amenities like portable water, electric power supply, road network, and tourist attractions. The literacy level of the community (as projected for the North Central zone of the country) is around 47.6% for females and 75.6% for males, and it is made up of people in all socio-economic strata.[5]

Study population
Chief executives and heads of units/departments of public and private organizations in Jos North LGA constituted the study population.

Any chief executive of an organization with a staff strength of at least 10 persons was included in the study.

Study design
This was a descriptive cross-sectional study.

Sample size determination
The minimum sample size was determined using the formula:

$$N = \frac{Z^2 pq}{d^2}$$

Where N = minimum sample size
Z = Standard deviate at 95% confidence interval = 1.96
p = Prevalence of obesity in adult population in Jos = 21.4%[4]
   = 0.214
q = Complimentary Probability to P (1- P) = 1 – 0.214 = 0.786
d = Error Margin = 5% = 0.05

Substituting: $N = \frac{(1.96)^2 \times 0.214 \times 0.786}{(0.05)^2} = 240$

A minimum sample size of 240 study subjects was calculated. For the study, 250 consenting adult subjects were selected.

Sampling technique
A multi-stage sampling technique was used to select study subjects:

Stage I: Jos North LGA was purposively selected for its being a major constituent of the state capital and commercial-nerve center of the state; therefore, likely to have a sizeable number of organizations to sample from.

Stage II: Using simple random sampling technique, 10 of the wards in Jos North LGA were selected from a list of

the 20 health wards in the LGA using randomly generated numbers.

Stage III: All the consenting chief executives and heads of units/departments of private and public organizations in the selected wards were recruited into the survey.

Data collection and analysis

Data was gathered from the selected executives using interviewer-administered questionnaires while their anthropometric measurements were taken using standard procedure with bathroom weighing scales and tape measures.

The body mass index of each subject was assessed using the formula:

$$BMI\,(kg/m^2) = \frac{Weight\ in\ Kilograms}{Height\ in\ meters^2}$$

All data generated was collated and analyzed using EPI info statistical software, version 3.5.3(2008). Respondent's knowledge regarding obesity was graded as good, fair, or poor based on the number of correct answers respondents gave to the twelve (12) questions asked to assess knowledge: A score of 0 – 4 was graded poor knowledge, 5 – 8 fair, and 9 – 12 good knowledge. Quantitative data were presented using mean and standard deviation while Chi-square was used to test for relationship between socio-demographics and anthropometric findings.

Ethical issues

Written permission for the study was gotten from the department of Community Medicine, Faculty of Medical Sciences, University of Jos (as the study was part of medical student survey while on posting in the department), while informed verbal consent was obtained from each subject before being enrolled into the study.

Limitations of the study

Since the assessments of dietary intakes and exercise done over time were based on the ability of the subject to recall these occurrences, this creates a recall bias and makes perfectly accurate assessments difficult.

RESULTS

The ages of the subjects ranged from 27 – 68 years, and their mean age was 44 + 2 years. Most of them (68%) were male while 91.6% were married. Civil servants constituted 48.7% of the studied population while lawyers constituted 3.4% [Table 1].

The prevalence of obesity was found to be 38%, while 48.8% of respondents were overweight. Subjects' BMI was found to be statistically related with sex [Table 2] and income [Table 3], but not with exercise [Table 4].

Knowledge of obesity, its contributory factors, and complications was fair in 63.6% of respondents [Table 5] although there was no statistically significant association between knowledge and BMI of the studied subjects.

DISCUSSION

The prevalence of obesity was 38% among the studied

Table 1: Socio-demographic characteristics of respondents

Variable	Frequency (*N* = 250)	Percentage
Age (years)		
20 - 29	7	2.5
30 - 39	65	25.8
40 - 49	105	42.2
50 - 59	71	28.7
60 - 69	2	0.8
Sex		
Female	80	32
Male	170	68
Marital status		
Married	229	91.6
Single	21	8.4
Occupation		
Banker	53	21.4
Civil servant	121	48.7
Health workers	12	4.7
Lawyers	9	3.4
Skilled workers	15	5.9
Trader/shop owner	22	8.8
Unskilled workers	18	7.1

Table 2: Relationship between sex and BMI of subjects

Sex	BMI (Kg/m²)			
	< 18.5	18.5 – 24.9	25.0 – 29.9	> 30.0
	FREQ %	FREQ %	FREQ %	FREQ %
Male	1 (0.6)	27 (15.5)	89 (51.1)	57 (32.8)
Female	0 (0)	5 (6.6)	33 (43.4)	38 (50.0)
Total	1	32	122	95

χ^2 = 9.15; df = 3; *P* = 0.0024. BMI: Body mass index, FREQ: Frequency

Table 3: Relationship between income and BMI of subjects

BMI (Kg/m²)	Monthly income		Total
	< 100,000	> 100,000	
	FREQ %	FREQ %	
< 18.5	1 (100)	0 (0)	1
18.5 – 24.9	6 (18.8)	26 (81.2)	32
25.0 – 29.9	50 (41.0)	72 (59.0)	122
> 30.0	8 (8.4)	87 (91.6)	95
Total	65 (26.0)	185 (74.0)	250

χ^2 = 129.81; df = 3; *P* < 0.001. BMI: Body mass index, FREQ: Frequency

Table 4: Relationship between exercise and BMI of subjects

	Exercise		BMI (Kg/m²)		Total
	<18.5 FREQ (%)	18.5 – 24.9 FREQ (%)	25.0 – 29.9 FREQ (%)	> 30.0 FREQ (%)	
Does	0 (0)	17 (12.7)	65 (48.5)	52 (38.8)	134
Doesn't	1 (0.9)	15 (12.9)	57 (49.1)	43 (37.1)	116
Total	1	32	122	95	250

$\chi^2 = 0.66$; df = 3; *P* = 0.7993. BMI: Body mass index, FREQ: Frequency

Table 5: Knowledge of obesity, risk factors, and complications

Knowledge	Frequency	Percentage
Good	49	19.6
Fair	159	63.6
Poor	42	16.8
Total	250	100

population of chief executives of public and private organizations in Jos North LGA. This prevalence is higher than the figures reported in a study of the general population in Jos North LGA in 2002.[4] The higher prevalence in this study can be attributed to the fact that chief executives by virtue of their occupation are more likely to lead a sedentary life: Sit for long office hours and can afford equipment to use in their homes and offices to reduce energy spending (telephones, internet services). Another explanation could be the fact that the monthly income of chief executives is above that of the average citizen, making it more likely for them to afford 'fast foods' and other calorie dense meals, which are a contributory factor to weight gain.[6-8] Also, between 2002 and the time of conducting this study, (2011), the living conditions of both the general population and executives of organizations have improved, making more money available for them to 'live the good life' and indulge in dietary habits, which increase the risk of obesity and overweight.[8]

Obesity was found to be more prevalent in female subjects than their male counterparts with 50% of the studied female executives being obese [Table 2]. This finding is consistent with those done among adult populations in Jos and Lagos.[4,9] The average age of the studied population of executives was 44 + 2 years; at this age, most females are likely to put on weight for various reasons including: Hormonal changes, reduced active child rearing (as many of their children are school-aged and do not require much maternal attention), and their ability as executives to afford house-helps and office subordinates who do most of their domestic and office activities for them.[10,11] On the other hand, more male subjects were found to be overweight than the female subjects. Possible reasons for this could be the fact that they have reduced physical activity but as males, are more likely to be taller than their female counterparts; since

BMI is a function of both height and weight, the 'shorter' females have an increased tendency for obesity while 'taller' males are overweight.

Hong *et al*, noted that certain confounding factors can alter the effects of gender and ovarian hormones on the susceptibility to overweight and obesity;[12] these are said to include: 1) Occupational differences between males and females (some jobs require more physical activity than others), 2) recreational/domestic physical activity differences between males and females, due to their differences in gender (particularly in Africa), 3) concomitant food intake pattern differences between males and females, and 5) reproductive differences (e.g., weight fluctuations during and after pregnancy for females).

Exercise was noted to lack a statistically significant association with the BMI of the studied subjects [Table 3]. Some studies have reported that exercise alone has little or no effect on the control of obesity; but combined with dieting, has a statistically significant control on weight gain and invariably on the BMI of studied subjects.[13,14] It is also thought that physical activity, which is the only controllable component of total average energy expenditure, accounts for barely 15-30% of the average daily energy expenditure.[11] Exercise alone, therefore, may not be adequate to control the excess energy gotten from the calorie intake of the average Nigerian whose staple diet is calorie dense. Most of the studied subjects were also not consistent with their exercises due to their tight daily official routines. These same official duties also take them regularly out of their homes, making it more difficult for them to maintain healthy eating habits and diets; they, therefore, tend to snack on fast foods more than the average worker.

A statistically significant relationship was found between the monthly incomes of the subjects in this study and their BMI [Table 4]. Findings of a study done between 1999 and 2005 among adult subjects in low, middle, and high-income countries aimed at assessing the effect of income on weight gain showed that the change in weight from a middle-income country was greater than from those in low- and

high-income countries.[8] It can be inferred that obesity tends to be higher in low- and middle-income individuals than in high-income owners. On the other hand, the harsh economic conditions of the country, coupled with the extended family settings of most Nigerian families/homes, make it difficult for even these 'well-paid' executives to meet up with the ever-increasing financial demands on their monthly income. This means their 'high' income also has to meet housing, clothing, educational, health, and recreational needs, leaving less money available for activities or indulgencies that increase their likelihood of weight gain.

Majority of the subjects (63.6%) had a fair knowledge of what obesity and overweight are, their possible causes and complications with only about 20% of them having good knowledge. This fairly low knowledge among the studied population can be attributed to their 'busy' schedules, the poor attitude of Nigerians to health issues as well as a failure by health personnel to emphasize on preventive rather than curative health education of patients and clients.

CONCLUSION

This study concluded that the prevalence of obesity and overweight among chief executives of public and private organizations in Jos North LGA was found to be high (38% and 48.8%, respectively). More males were overweight while female subjects tended to be obese, and knowledge of the causes and complications of these health conditions was generally fair among the studied subjects. It is, therefore, recommended that government and privately-owned organizations should insist on periodic medical check-up examinations and health education of their staff, particularly their executives/management staff, on overweight/obesity, causes, complications, and prevention.

REFERENCES

1. WHO. Bulletin of the World Health Organization on Obesity and Overweight. 2011;89;7:479-86.
2. WHO. The Challenge of Obesity; Strategies for Response – WHO/Europe. Available from: http://www.euro.who.int/document/E90711.pdf. [Last accessed on 2011 Jan 16].
3. Baron RB. Current Issues in Obesity; Diet, Exercise, Drugs and Surgery. Available from: http://www.ucsfcme.com/2008/.../10.Baron.ObesityOralWomens07.pdf. [Last accessed on 2012 Jan 01].
4. Puepet FH, Zoakah AI, Chuwak EK. Prevalence of overweight and obesity among Urban Nigerian adults in Jos. Highland Med Res J 2002;1:13-6.
5. National Population Commission (NPC) [Nigeria] and ICF Macro. Nigeria Demographic and Health Survey 2008. Abuja, Nigeria: National Population Commission and ICF Macro: 2009. p. 10-60.
6. Daniel JH. Obesity in Developing Countries; Causes and Implications. Available from: http//:www.fao.org/DOCREP/003/Y0600 M/y0600m05.htm. [Last accessed on 2011 Apr 16].
7. Bakari AG, Onyemelukwe GC, Sani BG, Aliyu IS, Hassan SS, Aliyu TM. Obesity, overweight and under-nutrition in suburban Northern Nigeria. Int J Diabetes Metab 2007;15:68-9.
8. Nammi S, Koka S, Chinnala KM, Boini KM. Aetiology of Obesity. Nutrition Journal: 2004 3.3 Available from: http//:www.nutritionj.com/content/3/1/3 - Cached [Last accessed on 2011 28/5/11.
9. Olatunbosun ST, Kaufman JS, Bella AF. Prevalence of obesity and overweight in urban adult Nigerians. Obes Rev 2011;12:4.
10. Roehling PV, Roehling MV, Vandlen JD, Blazek J, Guy WC. Weight discrimination and the glass ceiling effect among top US CEOs. Equal Oppor Int 2009;28:179-96.
11. Prentice AM. The emerging epidemic of obesity in developing countries. Int J Epid 2006;35:93-9.
12. Hong J, Stubbins RE, Smith RR, Harvey AE, Núñez NP. Differential susceptibility to obesity between male, female and ovariectomized female mice. Nut J 2009;8:12-6.
13. Wilhans RH. Textbook of Endocrinology. 6th ed. London: 1981. p. 320-2.
14. Tensdal TW, Sorensen T, Stunkard A. Genetics and early environmental component of sociodemographic influences on adult fatness. Available from: http://www.medline.com [Last accessed on 2011 Apr 21].