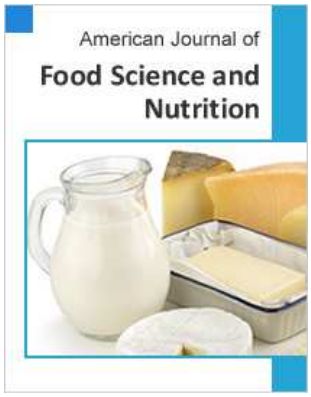
American Journal of Food Science and Nutrition
2015; 2(6): 101-107
Published online November 10 2015 (http://www.aascit.org/journal/ajfsn)
ISSN: 2375-3935



Keywords
Prevalence,
Adults,
Overweight,
Obesity

Received: August 21, 2015
Revised: October 17, 2015
Accepted: October 19, 2015

Prevalence of Overweight and Obesity in a Rural and a Semi-Urban Area of Southwest Nigeria

Olawuyi Yetunde O.[1, *], Ketiku A. O.[2]

[1]Food Science and Technology Department (Nutrition and Dietetics Unit), Faculty of Agriculture, Bowen University, Iwo, Osun State, Nigeria
[2]Human Nutrition Department, Faculty of Public Health, University of Ibadan, Oyo State Nigeria

Email address
yetundeoluolawuyi@gmail.com (Olawuyi Y. O.)

Citation
Olawuyi Yetunde O., Ketiku A. O. Prevalence of Overweight and Obesity in a Rural and a Semi-Urban Area of Southwest Nigeria. *American Journal of Food Science and Nutrition*. Vol. 2, No. 6, 2015, pp. 101-107.

Abstract
Several studies have been carried out on the prevalence of overweight and obesity among adults in urban areas of Nigeria, however there is insufficient data for the prevalence among the rural dwellers. It is also not clear if there is any difference in the prevalence of overweight and obesity between the rural and semi urban areas of Nigeria. A cross sectional study of anthropometrical parameters (weight and height) and body mass index (BMI) was conducted among 600 selected adult males and females in Iwo (a semi urban) local government area and Aiyedire (a rural) local government area of Osun State, South-Western Nigeria between August and October 2006. Pretested interviewer-administered questionnaires were used to obtain information on the socio-economic profiles, food consumption pattern and nutritional knowledge of the subjects. The prevalence of underweight, overweight and obesity in Iwo local government area were 4.7%, 25.3% and 11.3% respectively with 58.7% of the subjects falling within normal weight range. In Ayedire local government area, the prevalence of underweight, overweight and obesity were 7.3%, 22.3% and 13.6% respectively while the remaining 56.8% of the subjects studied fell within normal weight range. There was no significant difference (P value 0.38591) in the prevalence of overweight and obesity between the two local government areas.

1. Introduction

Obesity has emerged as a serious health challenge globally. Worldwide, at least 2.8 million people die each year as a result of being overweight or obese, and an estimated 35.8 million (2.3%) of global Disability Adjusted Life Years are caused by overweight or obesity. [1] The emerging epidemic of non-communicable diseases is adding to the burden of malnutrition and unlike what was previously believed, are no longer a problem restricted to affluent, industrialized countries but increasingly also affect developing countries. In developing countries therefore, diseases caused by energy inadequacy and deficiency continue to persist but co-exist with the growing presence of diet related chronic diseases among adults hence contributing to the double burden of malnutrition. [2] Many countries that historically sought and used national and international funds to combat micronutrient deficiencies and under nutrition are now facing the co-existence of underweight and overweight people among the lower income sectors of the society. This enigma appears more dire when the social and economic implications are considered [3]. Some diseases associated with obesity include hypertension, diabetes mellitus, and

atherosclerosis, as well as certain types of cancer; there are also many additional less known complications of the disease. The medical costs associated with being overweight and obese are enormous, and involve direct and indirect costs. The direct medical costs usually include preventive, diagnostic, and treatment services related to obesity. The indirect costs are related to morbidity and mortality costs. Morbidity costs are defined as the value of income lost from decreased productivity, absenteeism, restricted activity, and hospital admission days [4].

Despite the global concern about nutrition transition, there is insufficient data about the prevalence of overweight and obesity in Nigeria especially. Several regional studies have been carried out mostly in urban areas with a few studies carried out in the rural areas. From a systematic review carried out on the prevalence of overweight and obesity in Nigeria, the prevalence of overweight individuals ranged from 20.3%–35.1%, while the prevalence of obesity ranged from 8.1%–22.2% [5]. The prevalence of overweight and obesity in rural areas in Nigeria has not been well assessed and it is not clear if there is any difference in the prevalence between the rural and semi-urban areas of Nigeria. This study was therefore designed specifically to assess the prevalence of overweight and obesity among adults (18-79 years) in a semi-urban area (Iwo local government) and a rural area (Ayedire local government) of Osun State, South Western Nigeria.

2. Materials and Methods

The study was a descriptive, cross sectional survey carried out in Iwo and Ayedire Local Government Areas of Osun state located in the South Western part of Nigeria. Data collection was done between August and October 2006. The subjects of this study were adult men and women resident in Iwo and Aiyedire local government area of Osun state, aged between 18-79 (excluding pregnant women and sick adults) engaged in various kinds of occupation ranging from farming to civil service with the aim of assessing the prevalence of overweight and obesity.

A minimum sample size was determined using the statistical formula below according to Araoye [6];

$$\mathrm{N} = \frac{Z^2(1-P)P}{E^2}$$

Where N= minimum sample size

Z=standard normal variance=1.96 at 95% confidence interval

E= absolute standard error =0.05

P= prevalence

Using a prevalence of 21.4% from a previous study carried out in Jos [7], the calculated sample size was 258. A sample size of 300 subjects in each local government area were chosen to cater for incomplete data. Therefore, a total of 600 subjects were selected for the study.

Simple random sampling technique was used to select a rural and a semi-urban Local Government Area (LGA) out of the thirty LGAs in Osun State. Iwo and Ayedire were selected by balloting. Ayedire LGA consists of 10 wards spread across the four communities (namely Ile Ogbo, Olupona, Kuta and Oke Osun) which makes up the LGA while Iwo LGA consists of 15 wards. Representative samples were taken from each of the LGA. In Ayedire LGA, 75 subjects were selected from each of the community in the LGAs. In Iwo LGA, the fifteen wards were grouped into five groups of three wards each and 60 subjects were selected from each of the groups.

A pretested interviewer administered semi-structured questionnaire was used to collect information in the following areas; anthropometrics parameters, socio-economic characteristics, health information and food consumption pattern. Body weight was measured in kilograms using a portable bathroom scale which was validated daily using a known 10 kg weighted mass and measured to the nearest 0.1 kg. The subjects stood erect, bare feet, in minimal clothing and with their pockets free of objects that might add to their weights such as mobile phones, wallets, keys, rings, etc. The weighing scale was checked for zero error after each measurement. The subjects' heights were taken in meters with a height meter placed vertically against the smooth surface of the wall. The subjects stood barefooted and erect with feet parallel and heels, buttocks and shoulder firmly placed against the height meter. A ruler was used to digress the hair while the head was held erect and eyes looking directly ahead and the height was read and recorded to the nearest 0.1 meter. The body mass index (BMI) was calculated by dividing the measured weight in kilograms by the height in meters squared.

$$\mathrm{BMI}\left(\mathrm{kg}/m^2\right) = \frac{\text{weight (kg)}}{\text{Height}^2\ (m^2)}$$

The BMI of ≥30 kg/m ^{2} was taken as the operational definition of obesity with the following categorization: Class I obesity (mild obesity) = BMI of 30-34.9, class II obesity (moderate obesity) = BMI of 35-39.9 and class III obesity (severe obesity) = BMI of ≥ 40. [8]

A food frequency questionnaire was used to assess the food consumption pattern of the subjects and this was supported by a twenty four hour dietary recall to assess their dietary intake. Statistical Package for Social Sciences (SPSS) version 12.0 was used in analyzing the data collected.

Each of the subjects gave verbal consent to engage in the study.

3. Results

Six hundred respondents were interviewed, 300 from each Local Government Area (LGA). Table 1 shows the socioeconomic data of the respondents. In Iwo LGA, the subjects consisted of 138 females and 162 males while in Ayedire LGA, 108 females and 192 male were interviewed.

That is, 41.0% of the total respondents were females while 59.0% were males. The age of the respondents ranged from 18 to 79 years. Majority of the respondents (31.7%) belonged to the 18-29 age group, 14.8% fell within the 30-39 age bracket, 21.7% were aged 40-49years, 18.5% were aged 50-59 years, 10.2% fell within the 70-79 age bracket and only 3.2% of the respondents belonged to the 70-79 age group. The marital status of the respondents were stratified into four; married, never married, separated/divorced and widowed. 66.3% of the total respondents were married, 28.2% were never married, 0.7% were separated or divorced and 4.8% were widows or widowers. In Iwo LGA, 3.4% had no education/ koranic education only, 3.6% primary school, 23.4% secondary school and 69% tertiary education. In Ayedire LGA, 14% had no education/koranic education only, 18.6% primary school, 18% secondary school and 49.4% tertiary education as their highest form of education. For the primary occupation of the respondents, Iwo LGA had 14% peasant farmers, 7.6% petty traders, 0.6% unskilled laborers, 3% skilled artisans, 45.0% civil servants, 28.0% students and 1.7% others while in Ayedire LGA the result was 19.7%, 12.0%, 5.3%, 9.7%, 36.0%,16.7% and 0.6% respectively.

Table 2 shows the food consumption pattern and some health history of the respondents. Most of the respondents (54.7%) took starchy foods like eba on a daily basis. Fried foods were consumed twice or thrice a week by most of the respondents (33.5%), while 27.0% took fried foods on a daily basis, 13.0% weekly, 20.3% occasionally and 6.2% more than once a day. Availability ranked highest among the factors influencing food choice in Iwo LGA (28%), education was the second factor (24%) and disposable income ranked third (21.3%). In Ayedire LGA however, disposable income (25.3%) was the highest factor influencing food choice, followed by availability (24.0%) and education (18.7%) among other factors listed. Most of the respondents (66.7%) had some knowledge about fatty foods. Most of the respondents also claimed to engage in some of physical exercise like bicycling, long walk e.t.c regularly (however, their level of exercise was not measured).

Table 3 shows the distribution of BMI in the two LGAs. Most of the respondents in Iwo LGA (58.7%) fell within the normal weight range, 25.3% were overweight, 11.0% were obese, 4.7% were underweight and 0.3% were morbidly obese. In Ayedire LGA, 56.8% were within the normal weight range, 22.3% were overweight, 12.2% were obese, 7.4% were underweight and 1.4% were morbidly obese.

Table 4 shows the association between BMI and some variables

Table 1. *Socio-economic data of respondents.*

Variable	Iwo LGA	%	Ayedire LGA	%	Total	%
Age group(years)						
18 – 29	101	33.7	89	29.7	190	31.7
30 – 39	44	14.7	45	15.0	89	14.8
40 – 49	74	24.6	56	18.7	130	21.7
50 – 59	47	15.7	64	21.3	111	18.5
60 – 69	27	9.0	34	11.3	61	10.2
70 – 79	7	2.3	12	4.0	19	3.2
Total	300	100	300	100	600	100
Gender						
Female	138	46.0	108	36.0	246	41
Male	162	54.0	192	64.0	354	59
Total	300	100	300	100	600	100
Marital Status of respondents						
Married	196	65.3	202	67.3	398	66.3
Never married	91	30.3	78	26.0	169	28.2
Separated/Divorced	2	0.7	2	0.7	4	0.7
Widow/Widower	11	3.7	18	6.0	29	4.8
Total	300	100	300	100	600	100
Highest education attained						
None/Koranic	12	4.0	30	14.0	4	0.7
Primary school	11	3.6	56	18.6	47	7.8
Secondary school	70	23.4	54	18.0	124	20.7
Tertiary institution	207	69.0	148	49.4	404	67.3
Total	300	100	300	100	600	100

Primary occupation of the respondents						
Farmer	42	14.0	59	19.7	91	15.2
Petty trader	23	7.6	36	12.0	49	8.2
Unskilled labour	2	0.6	16	5.3	23	3.8
Skilled artisan	9	3.0	29	9.7	38	6.3
Civil servant	135	45.0	118	36.0	258	43.0
Student	84	28.0	50	16.7	134	22.3
Others	5	1.7	2	0.6	7	1.2
Total	300	100	300	100	600	100
Household size						
One or two	61	20.3	49	16.3	110	18.3
Three to six	170	56.7	178	59.3	348	58.0
Seven or more	69	23.0	73	24.4	142	23.7
Total	300	100	300	100	600	100
Monthly income (Naira)						
Less than 5,000	92	30.7	90	30.0	182	30.3
5,000 - 15,000	57	19.0	91	30.3	148	24.7
15,000 -30,000	95	31.7	70	23.3	165	27.5
More than 30,000	56	18.6	49	16.4	105	17.5
Total	300	100	300	100	600	100

Table 2. *Food consumption pattern and health history of respondents.*

Variable	**Iwo LGA**	**Ayedire LGA**	**Total**	**%**
Frequency of consumption of starchy foods				
More than once a day	36	38	74	12.3
Daily	161	167	328	54.7
Twice or thrice a week	74	77	151	24.2
Weekly	26	18	44	7.3
Occasionally	3	0	3	0.5
Total	300	300	600	100
Frequency of consumption of fried foods				
More than once a day	19	18	37	6.2
Daily	70	92	162	27
Twice or thrice a week	95	106	201	33.5
Weekly	34	44	78	13
Occasionally	82	40	122	20.3
Total	300	300	600	100
Frequency of consumption of snacks				
More than once a day	25	18	43	7.2
Daily	52	46	98	16.3
Twice or thrice a week	28	30	58	9.7
Weekly	21	30	51	8.5
Occasionally	174	176	350	58.3
Total	300	300	600	100
Factors influencing food choice				
Availabilty	84	72	156	26.1
Convenience	47	42	89	14.8
Advertisement	1	0	1	0.2
Education	72	56	128	21.3
Culture	30	12	42	7.0
Money on hand	64	76	140	23.3
Others	2	42	44	7.3
Total	300	300	600	100

Knowledge about fatty foods				
Yes	244	156	400	66.7
No	56	144	200	33.3
Total	300	300	600	100
Practice of exercise				
Yes	201	192	393	65.5
No	99	108	207	34.5
Total	300	300	600	100
Self-Reported cases of some non-communicable diseases				
High blood pressure	29	36	65	10.8
Diabetes	1	6	7	1.2
High cholesterol level	1	1	2	0.4
None	269	257	526	87.6
Total	300	300	600	100
Family history of overweight and obesity				
Yes	25	34	59	9.8
No	275	256	541	90.2
Total	300	300	600	100

Table 3. *Distribution of Body Mass index in the Local Government Areas.*

CLASSIFICATION	BMI	IWO LGA	%	AYEDIRE LGA	%
Underweight	<18.5	14	4.7	22	7.4
Normal weight range	18.5-24.9	178	58.7	164	56.8
Overweight	25-29.9	76	25.3	66	22.3
Obese (I & II)	30-39.9	33	11.0	36	12.2
Morbid Obesity	>40	1	0.3	4	1.4
TOTAL		300	100	300	100

Table 4. *Association between BMI and some variables.*

Variable	Chi square	P value	Chi square	P value
	Iwo LGA		Ayedire LGA	
Gender	10.338	0.035	12.944	0.012
Marital status	58.819	0.000	31.159	0.002
Education	17.021	0.384	25.181	0.014
Primary occupation	49.831	0.001	49.394	0.002
Household size	9.207	0.325	10.852	0.210
Monthly income	43.411	0.000	35.270	0.000
Frequency of solids intake	28.779	0.025	43.186	0.000
Frequency of fried foods intake	30.573	0.015	49.749	0.000
Frequency of snacks intake	15.779	0.468	25.522	0.100
Knowledge about fatty foods	4.182	0.362	8.349	0.080
Practice of exercise	9.542	0.049	13.288	0.010
Family history of obesity	1.966	0.742	9.560	0.049
High blood pressure	8.251	0.083	38.791	0.000
Diabetes	0.707	0.950	7.828	0.075
Cholesterol level	0.707	0.950	6.950	0.035

4. Discussion

The prevalence of overweight and obesity in the rural area (Ayedire) studied was 22.3% and 13.6 respectively. While in the semi-urban area (Iwo), it was 25.3% and 11% respectively. The incidences of overweight and obesity were higher than underweight in both Iwo and Ayedire LGAs, this is in sync with observation by previous studies [9], that the problem of malnutrition in many countries is gradually shifting from undernutrition to overnutrition. Although most of the respondents fell within the normal weight range, a high prevalence of overweight and obesity was recorded in both LGAs. This high prevalence of >10% indicates that overweight and obesity are becoming public health problems in both the rural and semi-urban areas of Osun State (South Western Nigeria). This implies that overweight and obesity in both the rural and semi-urban areas also deserve as much

public health concern as is being given to the urban areas. The importance of paying attention to the rural and semi-urban areas was further strengthened by the fact that there was no significant difference in the prevalence of overweight and obesity between the two Local Government Areas studied. The prevalence finding in this study is similar to findings in other rural and urban communities elsewhere in Nigeria and in other African nations. [10, 11, 12, 13,14]. A study in Remo North of Ogun State gave the prevalence of overweight and obesity as 21.4% and 10.5% respectively [15]. A study among rural adults in the North central region of Nigeria gave the prevalence of overweight and obesity to be 23.3% and 8% respectively [16]. Several studies in urban Nigeria have established that the prevalence of overweight and obesity is critical and deserves urgent attention [7, 17, 18]. It has become an issue of profound public health interest because of the clearly defined negative effect of obesity in relation to coronary heart disease, diabetes and other chronic diseases of lifestyle.

In both Iwo and Ayedire LGAs, there was significant association between BMI and gender, marital status, primary occupation, monthly income, frequency of solids intake and frequency of fried foods intake. This agrees with several studies that have established a higher prevalence of overweight and obesity among married women [10, 12, 15, 18]. Previous study on market women [19] also showed that a sedentary occupation or lifestyle could be a serious risk factor in the etiology of overweight and obesity.

There was no significant association between BMI and education, household size, intake of snacks, knowledge about fatty foods, exercise, family history of overweight, high blood pressure, diabetes and cholesterol level .Several studies have reported a strong relationship between BMI, decreased physical functioning and reduction in overall productivity [20, 21]

5. Conclusion and Recommendation

The prevalence of overweight and obesity were higher than the prevalence of underweight in both the rural and semi urban areas studied. This demands urgent attention because a developing country like Nigeria will find it difficult to cope with the double burden of malnutrition. Urgent, widespread nutrition education and sensitization needs to be carried out among rural and semi urban Nigerians, since it can be deduced from this study that the issue of overweight and obesity is not limited to the urban dwellers alone.

References

[1] WHO. Global health observatory (GHO) data, retrieved from www.who.int/gho/ncd/risk_factors/obesity. 2015.

[2] Schmidhuber J, Shetty P. Nutrition transition, obesity and non-communicable diseases: drivers, outlook and concerns. SCN News 2005; 29: 13-19.

[3] WHO. Global strategy on diet, physical activity and health. Bulletins of the WHO 2006; 5: 16-18.

[4] Iloh G, Amadi AN, Nwakwo BO, Ugwu VC. Obesity in adult Nigerians: A study of its pattern and common primary co-morbidities in rural mission general hospital in Imo State, South Estern Nigeria. Niger. J. Clin. Pract 2011; 14: 212-218.

[5] Chukwunonye II, Chuku A, John C, Ohagwu KA, Imoh ME, Isa SE, Ogah OS, Oviasu E. Prevalence of overweight and obesity in adult Nigerians – a systematic review. Diabetes Metab Syndr Obes. 2013; 6: 43–47.

[6] Araoye MO. Sample size determination. In: Margaret OA, editor. Research Methodology with Statistics for health and social sciences. Ilorin, Nigeria: Nathadex Publishers; 2004. pp. 115–9.

[7] Puepet FH, Zoakah AL, Chuhwak EK. Prevalence of overweight and obesity among urban Nigerian adults in Jos. Highland medical research journal 2000; 1: 13-16

[8] WHO. Physical status: the use and interpretation of anthropometry. Report of a WHO Expert Committee. WHO technical Report Series 854. Geneva: World Health Organization, 1995.

[9] Hawkes C, Eckhardt C, Ruel M, Minot N. Diet Quality, Poverty and Food Policy: A new research agenda for obesity prevention in developing countries. SCN News 2005; 29: 20-22.

[10] Oladapo OO, Salako L, Sodiq O, Shoyinka K, Adedapo K, Falase AO. A prevalence of cardiometabolic risk factors among a rural Yoruba south-western Nigerian population: A population-based survey. Cardiovasc Afr 2010; 21:26-31.

[11] Siminialayi IM, Emem-Chioma PC, Dapper DV. The prevalence of obesity as indicated by BMI and waist circumference among Nigerians adults attending family medicine clinics as outpatients in Rivers State. Niger J Med 2008; 17: 340-5.

[12] Fasanmade OA, Okubadejo NU. Magnitude and gender distribution of obesity and abdominal adiposity in Nigerians with type 2 diabetes mellitus. Niger J Clin Pract 2007; 10: 52-7.

[13] Abubakari AR, Bhopal RS. Systematic review on the prevalence of diabetes, overweight/obesity and physical inactivity in Ghanaians and Nigerians. Public Health 2008; 122: 173-82.

[14] Ahaneku GI, Osuji CU, Anisiuba BC, Ikeh VO, Oguejiofor OC, Ahandu JE. Evaluation of blood pressure and indices of obesity in a typical rural community in Eastern Nigeria. Am Afr. med 2011; 10: 120-126.

[15] Raimi TH, Odusan O, Fasanmade O. High prevalence of central obesity in rural south western Nigeria: Need for targeted prevention. J. Diabetes and endocrinology 2015; 6(3); 12-18.

[16] Etukumana EA, Puepet FH, Obadofin M. Prevalence of overweight and obesity among rural adults in North central Nigeria. Nig J. family practice. 2013; 3(2).

[17] Olatunbosun ST, Kaufman JS, Bella HT. Prevalence of obesity and overweight in urban adult Nigerians. Journal of obesity reviews12 2010; (4): 233-241.

[18] Desalu OO, Salami AK, Oluboyo PO, Olarinoye JK. Prevalence and socio-demographic determinants of obesity among adults in an urban Nigerian Population. Sahel med journal 2008; 11(2); 61-64.

[19] Sanusi RA, Samuel FO, Jimoh A, Agbonkhese RO. Obesity and hypertension amongst marke men and women in Ibadan, Nigeria. European journal of scientific research (2005) 9; 16-24.

[20] Rissanen, AM. The economic and psychosocial consequences of obesity. Ciba Found. Symp, 1996; 201: 194-201.

[21] Seidell JC. Societal and personal costs of obesity. Exp.clin.endo diabetes, 1996; 106 (suppl.2): 7-9.