Obesity and Hypertension amongst Traders in Ijebu Ode, Nigeria

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ABSTRACT
Market traders spend most hours of the day sitting down and involved in many other sedentary activities, conditions which increase the risk of chronic diseases. This study was designed to determine the prevalence of obesity and hypertension amongst market men and women in Ijebu- Ode, Nigeria. A cross-sectional study involving 157 (52.3%) males and 143 (47.7%) females was conducted. Body mass index (BMI) was derived from weight and height measurements; waist circumference (WC) measurement was taken to assess abdominal obesity. Blood pressure was measured using a digital sphygmomanometer. The mean(±S.E) age in the study was 39.04(0.658) years, mean(±S.E) BMI, SBP and DBP were 26.36(0.32)kgm^{-2}, 116.64(1.27)mmHg and 79.50(0.86)mmHg respectively. Based on BMI, the prevalence of overweight and obesity were 25.3% and 26.7%. About 52.0% of the respondents had abdominal obesity. Prevalence of both general and abdominal obesity were significantly higher among females than males (p<0.05). The overall prevalence of hypertension was 16.0%. Body Mass Index was significantly related to both systolic and diastolic blood pressure (p<0.05). Obesity and hypertension among market men and women in Ijebu-Ode constitute health issues of public health importance. Sensitization on prevention and control of these disorders is important to protect those in this community from obesity related health challenges.

Keywords: Obesity, hypertension, market men and women, Nigeria.

INTRODUCTION
Recent global figures indicate that the prevalence of obesity is not just a problem of the developed countries but is also on the increase in the developing world and that 65% of the world's populations live in countries where overweight and obesity kill more people than underweight (WHO, 2014; Steven et al., 2012). The situation may be worse in African context, where body fatness is associated with beauty, fame and evidence of good living and health particularly in women; furthermore, African men are purported to have a preference for overweight over thin women (Adeboye et al., 2012). In Nigeria, the prevalence of obesity among adults has been estimated to range from 8.1 to 22.2% (Chukwuonye et al., 2013). Similarly, the prevalence of hypertension in sub-Saharan Africa has been estimated range from 19 to 38% (Hendriks et al., 2012); and that among adult Nigerians is placed at 44.9% (Murthy et al., 2013). Consequences of both obesity and hypertension are enormous. In Nigeria, obesity and hypertension are implicated in various health challenges including diabetes mellitus, dyslipidemia, gynecological complications, cancer, stroke, sudden deaths, medical stroke, heart failure, Psychiatric disorders etc (Madaugwu et al., 2012; Mustapha et al., 2012; Ekpenyong et al., 2011; Ogunniyi et al., 2011; Ukoli et al., 2007). Furthermore, excessive body fat is strong
linked with the risk of hypertension (Wilson et al.,
2002). In Nigeria, the risk of hypertension is about
two times higher among obese individuals than those with
normal body weight (Ekanem et al., 2013; Wahab et
al., 2011).
Physical inactivity has been identified as a major cause
of excessive body weight and high blood pressure
(WHO, 2014; WHO, 2013; Mahfouz et al., 2011).
Market men and women spend most hours of the day
sitting down and involved in many other sedentary
activities and consume diets with mean daily energy
intake far higher than recommended levels (Afolabi et
al., 2004); conditions that increase their risk of
developing obesity and/or hypertension.
Studies on prevalence of obesity and hypertension
among various groups in Nigeria are limited to few
locations and categories of people, causing paucity of
data on prevalence of these conditions in the country.
Providing information on the prevalence of obesity and
hypertension will contribute to the wealth of knowledge
on chronic diseases among Nigerians; help to make
informed choices on intervention strategies and as well
as evaluate any ongoing attempts to curb these diseases.
Hence this study is set to assess the prevalence of
obesity and hypertension among market men and
women.

METHODOLOGY

This study adopted a cross sectional and descriptive
design. Subjects included market men and women, 18
to 73 years who were randomly selected from Oke-Aje
and Ita Osun markets, all in Ijebu Ode, Ogun State,
Nigeria.
A total of 300 respondents were selected based on
22.2% prevalence of obesity reported by Chukwuonye
et al., (2013) from the findings of a systematic review
of obesity among adult Nigerians.
A semi structured questionnaire was used to collect
information for this study. Demographic and socio-
economic information obtained included age, gender,
marital status, religion, occupation, and educational
status.
Obesity was assessed using Body Mass Index and
waist circumference (WC); hence, anthropometric
measurements of weight, height and waist
circumference were obtained. Body weights were
taken using a digital bathroom scale. The readings were
taken to the nearest 0.1kg. Each subject was made to
stand erect on the scale with light clothing and without
shoes. An object with a known weight was used to
standardize the scale readings. Heights were measured
to the nearest 0.1cm using the Stadiometer. Subjects
were made to stand erect with bare foot and eyes
directed straight ahead. Weight and height
measurements were used to calculate body mass index
(BMI), which was used to classify subjects according to
the World Health Organization (WHO) guidelines
(WHO, 2000).
WC (in centimetres) was measured using a flexible,
non-stretchable tape measure, at the midpoint between
the lower rib border and the iliac crest at the end of
expiration while participants were standing upright.
Subjects were classified based on the WHO guidelines
(WHO, 2008).
Blood pressure measurements were made using
Digital sphygmomanometer. Two measurements of
Systolic Blood Pressure (SBP) and Diastolic Blood
Pressure (DBP) (measured in mmHg) were taken.
Hypertension was diagnosed according to the "Seventh
report of the Joint National Committee (JNC) on
Prevention, Detection, Evaluation, and Treatment of
High Blood Pressure (Chobanian et al., 2003).
All data were analyzed using Statistical Package
for Social Science (SPSS) version 15. Frequencies and
descriptive statistics of concerned variables were
reported. Significant associations between dependent
and explanatory variables were determined using
appropriate statistical tools.

RESULTS

Socio-economic Characteristics and Descriptive
Statistics: A total of three hundred (300) market men
and women participated in this study. Respondents
were made up of 157 (52.3%) males and 143(47.7%)
females. About 78.7% were married, 57.7% had
secondary education and more than half (61.0%) were
Muslims. The mean ±S.E age, weight and height of
respondents in the study were 39.04±0.658 years,
72.78±0.79kg and 1.67±.005m respectively. The mean
BMI, SBP and DBP were 26.3±0.32kgm -2,
116.64±1.27mmHg and 79.50±0.86mmHg
respectively.
Based on BMI, the total prevalence of overweight
and obesity in this study were 25.3% and 26.7%
respectively. Prevalence of overweight and obesity
were 21.7% and 29.4% among males; 20.4% and
33.6% among females respectively. Overall, 22.9% and
83.9% of the males and females had abdominal obesity
respectively. The overall prevalence of abdominal
obesity was 52.0%.
Stage I hypertension was 12.0% and 22.7% for
SBP and DBP respectively and stage II hypertension
was 3.7% and 8.3% respectively for SBP and DBP.
Prevalence of pre-hypertension was 29.7 and 21.3
respectively. The overall prevalence of hypertension
was 16.0%.
Table 1: Socio-demographic characteristic of the respondents

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Frequency</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>157</td>
<td>52.3</td>
</tr>
<tr>
<td>Female</td>
<td>143</td>
<td>47.7</td>
</tr>
<tr>
<td>Total</td>
<td>300</td>
<td>100.0</td>
</tr>
<tr>
<td><strong>Marital status</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Single</td>
<td>47</td>
<td>15.7</td>
</tr>
<tr>
<td>Married</td>
<td>236</td>
<td>78.7</td>
</tr>
<tr>
<td>Separated</td>
<td>5</td>
<td>1.7</td>
</tr>
<tr>
<td>Widowed</td>
<td>12</td>
<td>4.0</td>
</tr>
<tr>
<td>Total</td>
<td>300</td>
<td>100.0</td>
</tr>
<tr>
<td><strong>Level of Education</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No formal</td>
<td>24</td>
<td>8.0</td>
</tr>
<tr>
<td>Primary</td>
<td>66</td>
<td>22.0</td>
</tr>
<tr>
<td>Secondary</td>
<td>173</td>
<td>57.7</td>
</tr>
<tr>
<td>Post secondary</td>
<td>37</td>
<td>12.3</td>
</tr>
<tr>
<td>Total</td>
<td>300</td>
<td>100.0</td>
</tr>
<tr>
<td><strong>Religion</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Christian</td>
<td>116</td>
<td>38.7</td>
</tr>
<tr>
<td>Muslim</td>
<td>183</td>
<td>61.0</td>
</tr>
<tr>
<td>Other</td>
<td>1</td>
<td>0.3</td>
</tr>
<tr>
<td>Total</td>
<td>300</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Analysis on the relationship between obesity and hypertension revealed significant association between BMI and both SBP and DBP. These association were observed between BMI and both SBP and DBP at pre-hypertension levels (p=0.000) for both.

Table 2: Body Mass Index and waist circumference category

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Male No(%)</th>
<th>Female No(%)</th>
<th>Total No(%)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>BMI</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Underweight</td>
<td>2(0.7)</td>
<td>5(1.7)</td>
<td>7(2.3)</td>
<td></td>
</tr>
<tr>
<td>Normal</td>
<td>89(29.7)</td>
<td>48(16.0)</td>
<td>137(45.7)</td>
<td></td>
</tr>
<tr>
<td>Overweight</td>
<td>34(11.3)</td>
<td>42(14.0)</td>
<td>76(25.3)</td>
<td>0.001</td>
</tr>
<tr>
<td>Obese</td>
<td>32(10.7)</td>
<td>48(16.0)</td>
<td>80(26.7)</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>157(52.3)</td>
<td>143(47.7)</td>
<td>300(100.0)</td>
<td></td>
</tr>
<tr>
<td><strong>WC</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Normal</td>
<td>121(77.1)</td>
<td>23(16.1)</td>
<td>144(48.0)</td>
<td>0.001</td>
</tr>
<tr>
<td>Action Level I</td>
<td>28(17.8)</td>
<td>33(23.1)</td>
<td>61(20.3)</td>
<td></td>
</tr>
<tr>
<td>Action Level II</td>
<td>8(5.1)</td>
<td>87(60.8)</td>
<td>95(31.7)</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>157(52.3)</td>
<td>143(47.7)</td>
<td>300(100.0)</td>
<td></td>
</tr>
</tbody>
</table>

Table 3: Hypertension categorization

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Systolic Blood Pressure No(%)</th>
<th>Diastolic Blood Pressure No(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal</td>
<td>164(54.7)</td>
<td>143(47.7)</td>
</tr>
<tr>
<td>Pre-hypertension</td>
<td>89(29.9)</td>
<td>64(21.3)</td>
</tr>
<tr>
<td>Stage I</td>
<td>36(12.0)</td>
<td>68(22.7)</td>
</tr>
<tr>
<td>Stage II</td>
<td>11(3.7)</td>
<td>25(8.3)</td>
</tr>
<tr>
<td>Total</td>
<td>300(100.0)</td>
<td>300(100.0)</td>
</tr>
</tbody>
</table>

Table 4: The relationship between Obesity and Hypertension (HTN)

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Underweight</th>
<th>Normal</th>
<th>Overweight</th>
<th>Obese</th>
<th>Total</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Systolic Blood Pressure</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Normal</td>
<td>3(1.0)</td>
<td>86(28.7)</td>
<td>38(12.7)</td>
<td>16(5.3)</td>
<td>143(47.7)</td>
<td></td>
</tr>
<tr>
<td>Pre-HTN</td>
<td>3(1.0)</td>
<td>21(7.0 )</td>
<td>16(5.3)</td>
<td>24(8.3)</td>
<td>64(21.3)</td>
<td>0.000</td>
</tr>
<tr>
<td>Stage I HTN</td>
<td>1(0.3)</td>
<td>23(7.7 )</td>
<td>16(5.3)</td>
<td>28(9.3)</td>
<td>68(22.7)</td>
<td></td>
</tr>
<tr>
<td>Stage II HTN</td>
<td>0(0.0)</td>
<td>7(2.3 )</td>
<td>6(2.0)</td>
<td>12(4.0)</td>
<td>25(8.3)</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>7(2.3)</td>
<td>137(45.7)</td>
<td>76(25.3)</td>
<td>80(26.7)</td>
<td>300(100.0)</td>
<td></td>
</tr>
<tr>
<td><strong>Diastolic Blood Pressure</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Normal</td>
<td>6(2.0)</td>
<td>99(33.0)</td>
<td>41(13.7)</td>
<td>18(6.0)</td>
<td>164(64.7)</td>
<td></td>
</tr>
<tr>
<td>Pre-HTN</td>
<td>1(0.3)</td>
<td>24(8.0 )</td>
<td>25(8.3)</td>
<td>39(13.0)</td>
<td>89(29.7)</td>
<td>0.000</td>
</tr>
<tr>
<td>Stage I HTN</td>
<td>0(0.0)</td>
<td>13(4.3 )</td>
<td>9(3.0)</td>
<td>14(4.7)</td>
<td>36(12.0)</td>
<td></td>
</tr>
<tr>
<td>Stage II HTN</td>
<td>0(0.0)</td>
<td>1(0.3 )</td>
<td>1(0.3)</td>
<td>9(3.0 )</td>
<td>11(3.7 )</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>7(2.3)</td>
<td>137(45.7)</td>
<td>76(25.3)</td>
<td>80(26.7)</td>
<td>300(100.0)</td>
<td></td>
</tr>
</tbody>
</table>
DISCUSSION

This study recorded high prevalence of both general and abdominal obesity (table 2) among market men and women in Ijebu Ode. The causes of obesity among market traders are not farfetched as these group of people are mostly engaged in sedentary activities, coupled with long hours of physical inactivity and high energy intake (Afolabi et al., 2004). Similar studies equally revealed high prevalence of obesity among market traders across Nigeria (Odugbemi et al., 2012; Awosan et al., 2014). The findings in this study are comparable to 28.1% prevalence of obesity reported among traders in Sokoto state (Awosan et al., 2014), but higher than 12.3% recorded amongst traders in an urban market in Lagos State (Odugbemi et al., 2012). Due to the dearth of information on waist circumferences of market traders in Nigeria, it is difficult to make comparisons with the findings in this study regarding abdominal obesity. However, the prevalence of abdominal obesity from this study is higher than 33.8% reported amongst adults in Ogbomoso, Nigeria (Amole et al., 2011). Both general and abdominal obesity among market men and women are of particular health concern, bearing in mind the health consequences of both conditions facing the adult populations in Nigeria (Maduagwu et al., 2012; Mustapha et al., 2012; Ekpenyong et al., 2011; Ukoli et al., 2007).

The result showed that more women had both general and abdominal obesity than men, and these differences were statistically significant (p<0.001). This finding is in line with those from previous studies, where female gender is always found as a significant predictor of obesity (Wahab et al., 2011; Amole et al., 2011). Females are particularly predisposed to obesity due to the natural composition of the body, where females at and over puberty store higher body fat than males. Furthermore, cultural norms in Africa predispose more women to increased body weight as body fatness is associated with beauty, fame and evidence of good living and health among women (Adeboye et al., 2012).

Significant proportions of the respondents in this study were hypertensive as revealed in the 16.0% of hypertension. This rate of hypertension in this study is however lower than the 42.0% recorded in a market population in Enugu, Nigeria (Ulasu et al., 2011). This study did not take into consideration factors that predisposed individuals to hypertension; hence it is difficult to identify the possible cause of lower rate of hypertension in this population. Besides BMI, several other factors including inappropriate dietary intake, increasing age, gender, urban residence (Murthy et al., 2013; Ulasu et al., 2011; Brown et al., 2011), etc have been identified to increase the risk of hypertension in populations.

There was a significant relationship between BMI and increased blood pressure (table 4). The link between obesity and the risk of hypertension has already been established in studies. Furthermore, previous studies on association between obesity and hypertension in Nigeria established that, obese patients have increased risk of hypertension (Ekanem et al., 2013; Wahab et al., 2011). One implication of this finding is that, the obese individuals are more likely to be faced with double health challenges associated with both hypertension and obesity (Mustapha et al., 2012; Ojji et al., 2009).

In conclusion, obesity and hypertension among market men and women in Ijebu-Ode constitute health issues of public health importance. Sensitization on prevention and control of these disorders is important to protect those in this community from obesity related health challenges.

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