Nutritional status and market activities of female traders in a major City South East, Nigeria

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Abstract

Background: The market place as an occupational environment can predispose individuals to obesity, mainly due to the sedentary nature and enhanced access to food. Information on the nutritional status of market women is scarce in Nigeria **Methods:** The cross-sectional study was undertaken at Umuahia main market and involved 240 women. By using a questionnaire socio-demographic characteristics and market activities of respondents were recorded. Anthropometric measurements were used to assess the Body Mass index (BMI) and waist hip circumference ratio (WHR). Food frequency questionnaire was used to obtain information on the frequency of consumption of foods. Data were analyzed using descriptive statistics and Pearson correlation coefficient. **Results:** One third (36.7%) of the women went to the market six times a week. Market activities of 40% of the women mainly involved sitting and selling their wares. Green leafy vegetables (41.52%), baked products (40.36%) and roots/tubers (38.33%) were the main food groups consumed at least twice a week. BMI classification showed that 25% and 31.7% were overweight and obese, respectively. There was a weak but significant correlation between BMI and snack consumption ($r=0.3313$; $p<0.05$). **Conclusion:** Prevalence of obesity was high. Awareness campaigns on need for regular exercise should be emphasized in market places.

Key words: Nutritional status, market activities, dietary habits, BMI, women,

Introduction

Women are responsible for generating food security for their family members in developing countries (Akinloye, 2010). A review of reports on women in sub Saharan Africa revealed that their role in both subsistence food production and food preparation may give them more control over their own and children's dietary consumption than in some other regions of the world, however, this comes at the cost of extremely long and energy demanding work days (Harrison *et al.,* 1985; FAO/WHO, 1992; World Bank, 1992).

Women constitute the greatest percentage of traders found in various markets where they stay from dawn to dusk. Their dietary habits may lead to poor and even dangerous lifestyle. Their market activities may influence lifestyle or determine the lifestyle which may eventually affect their nutritional status. The market place is an occupational environment that can predispose individuals to obesity, mainly due to the sedentary nature and enhanced access to food (Afolabi *et al.,* 2004). Market men and women spend most hours of the day sitting down and involve in many other sedentary activities and consume diets with mean daily energy intake higher than recommended levels (Afolabi *et al.,* 2004). These conditions increase their risk of developing obesity and other non-communicable diseases. A study of traders across various parts of Nigeria revealed prevalence of obesity to be 16.3% in Ibadan (Balogun and Owoaje, 2007), 12.3% in Lagos (Odugbemi *et al.,* 2012) and 28.1% in Sokoto (Awosan *et al.,* 2014). There is, however, dearth of information on abdominal obesity and market activities of female traders. This study will therefore assess the dietary habits, market activities and nutritional status of female traders. It is believed that this would in turn provide a foundation for designing interventions that would be effective in improving their nutritional situation.

Methods

Area of study

The study was carried out at Umuahia main market in Umuahia North Local Government Area (LGA) of Abia State, Nigeria. Umuahia main market is bordered by two major towns Ibeku and Ohuhu.

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Study design

The study was a cross-sectional survey of market women in Umuahia main market carried out between June and July, 2012.

Sample size determination

A sample size of 240 was calculated using the formula: $n=Z^2P(100-P)/X^2$ (Araoye, 2003), where Z represents 95% confidence interval taken to be 1.96, X is 5% margin of error and P is estimated prevalence of obesity (16.3%) among female traders in Nigeria (Balogun and Owoaje, 2007).

Sampling technique

Multi-stage sampling was employed in selecting the women. The market was stratified into three different sections comprising of those at "*Isi"* gate (i.e. those who do not have shops but stay under an umbrella cover), those who stay inside the market with small stalls/ shops and those at good-shed with comfortable shops). From the three different sections, systematic sampling was employed in selecting 40 women from each of the sections. A sampling interval of three was chosen and the first trader was selected between 1 and 3, thereafter, every 3rd trader was subsequently selected until the required sample size was obtained.

Data collection

Two research assistants were trained in questionnaire administration and instrumentation techniques. Validation of the questionnaire was done by lecturers in the Department of Human Nutrition and Dietetics, Michael Okpara University of Agriculture, Umudike. Corrections and suggestions were incorporated to produce the final draft of the questionnaire. Pre-test was carried out using a group of market women in Ohokobe market in the same local government but these were not used in the final data analysis. The questionnaire was used to collect information on socio-demographic characteristics, market activities, dietary habits and food consumption pattern.

Anthropometric measurements

Anthropometric measurements of weight and height were taken and these were used to calculate the Body Mass Index (BMI). Weight was measured using a bathroom scale (HANSON model) which was adjusted to zero before each measurement was taken. The respondents stood without shoes and with their hands resting by their sides and readings were taken to the nearest 0.1 kilogram. Height was measured using a calibrated heightometer. The respondents stood straight without shoes on a flat surface, with their head straight and height readings were taken to the nearest 0.1 meter. The measurements were taken in duplicates using standard procedures and the averages were used (WHO, 1995).

The Body Mass index (BMI) and waist hip ratio (WHR) were used as indicators of nutritional status. BMI was calculated as body weight (kg) divided by height (m^2) and women were classified as normal (BMI<18.49kg/ m2), overweight (BMI=18.50-24.99kg/m^2) and obese (BMI>25kg/m^2) using WHO standards (WHO, 2000). Waist and hip circumferences were measured and used for the calculation of waist-hip ratio (WHR). Waist circumference was measured using a non-stretchable tape placed between the lower rib margin and iliac crest, while hip circumference was taken by placing the tape firmly around the hip at the point of the greatest circumference and measurement was taken to the nearest 0.1cm. Waist-hip ratio (WHR) was calculated by dividing the waist by the hip circumference (WHO, 1995). WHR was defined as "at risk" if it was >0.85 for females (WHO, 2000).

Food consumption pattern

A previously validated food frequency questionnaire (FFQ) (Ukegbu, 2014) was used to estimate the frequency of consumption of common foods. The respondents were asked to report the types of foods consumed and frequency of consumption (daily, weekly etc).

Statistical analysis

Data were analysed using SPSS version 15.0. Results were presented as frequencies and percentages. Pearson correlation analysis was used to determine the relationship between the nutritional status of the market women (BMI) and their dietary habits. A p-value of less than 0.05 was regarded as statistically significant.

Results

Socio-demographic characteristics

Table 1 revealed that most (28.3%) of the market women were within the age group of 30-39 years, majority were married (65%), while over half (55.0%) were residing in the urban areas. About 91.7% were educated with secondary school holders having the highest percentage (46.7%), while 8.3% had no formal education (Table 1).

Table 1. Socio-demographic characteristics of the market women

Parameters	Frequencies	Percentages
Age (years)		
<30	52	21.7
30-39	68	28.3
40-49	48	20.0
>50	72	30.0
Marital status		
Married	156	65.0
Single	36	15.0
Widowed	36	15.0
Divorced	12	5.0
Place of residence		
Urban	132	55.0
Rural	108	45.0
Level of education		
None	20	8.3
Primary	76	31.7
Secondary	112	46.7
Tertiary	32	13.3

Distribution of the market women according to their market/physical activities

Most of the women (55%) wake up before 6.00am daily, while the rest (45%) wake up after 6.00am daily as shown in Table 2. The resumption time in the market for about half (55%) of the women was between 6.31-7.00 am daily. About half (56.7%) of the market women leave the market between 5.00-6.00pm daily, while 33.3% leave after 6.00pm. Most of them (36.7%) went to the market six times a week, while the rest went between zero to five times per week (53.3%). Majority (60%) spent between 3-6 hours of their time sitting and selling their wares, on the other hand, 63.3% noted they spent 3-6 hours walking around in the market (Table 2).

Dietary habits of the market women

Dietary habits of the market women revealed that most of the women (62.5%) usually miss their breakfast while more than half (58.3%) missed meals due to lack of time to cook. The commonly consumed snacks were meat pie/biscuits (36.7%) and cakes (27.5%). More than half (57.9%) took one form of alcoholic beverage at least twice a week, while none of the respondents smoked (Table 3).

Table 2. Distribution of the women according to their market activities

Options	n	%
Wake up time by the women		
Before 6am	132	55.0
6.00-6.30 am	60	25.0
6.31-7.00 am	36	15.0
7.01-7.30 am	8	3.3
7.31-8.00am	4	1.7
After 8.00am	0	0.0
Resumption time in the market place		
Before 6am	20	8.3
6.00-6.30 am	40	16.7
6.31-7.00 am	132	55.0
7.01-7.30 am	48	20.0
7.31-8.00am	0	0.0
After 8.00am	20	8.3
Time they leave the market		
12 noon- 1.00pm	4	1.7
1.01-2.00pm	0	0.0
2.01-3.00pm	0	0.0
3.01-4.00pm	20	8.3
4.01-5.00pm	24	10.0
5.01-6.00pm	112	46.7
After 6.00pm	80	33.3
Number of days they go to the market		
Once	0	0.0
>3	20	8.3
4	84	35.0
5	24	10.0
6	88	36.7
7	24	10.0
Time spent sitting in the market		
3-6 hours	144	60.0
7-12hours	68	28.3
Not sure	28	11.7
Time spent walking around in the market		
3-6hrs	76	63.3
6.1-12hrs	36	30.0
Not sure	8	6.7

Table 3. Dietary habits of the market women

Variables	n	%
Meals usually missed		
Breakfast	150	62.5
Lunch	62	25.8
Dinner	28	11.7
Reason for missing meals		
No time to cook or eat it	140	58.3
Don't like taking the meal	28	11.7
To maintain my figure	24	10.0
Habit formed	24	10.0
Makes me lazy for the day	24	10.0
Snacks eaten while in the market		
Cakes	66	27.5
Meat pie/biscuits	88	36.7
Moimoi/akara	48	20.0
Groundnut	10	4.2
Fruits	28	11.7
Alcohol consumed at least twice a week		
Stout	100	41.7
Other beers	24	16.2
None	116	48.3
Smoking		
Yes	0	0.0
No	120	100.0

Anthropometric characteristics of the market women

Table 4 shows that the prevalence of overweight and obesity were 25% and 31.7%, respectively. Using WHR classification, about two-thirds (75.8%) were at risk of abdominal fat accumulation. Correlation analysis revealed that there was a weak but significant correlation between BMI and snack consumption ($r=0.3313$; $p<0.05$).

Table 4. Anthropometric indices of the market women

Parameter	n	%
BMI		
Normal (18.50-24.99 kg/m^2)	104	43.3
Overweight (25.00-29.99 kg/m^2)	60	25.0
Obese (>30 kg/m^2)	76	31.7
WHR		
Safe level (<0.85)	58	24.2
At risk (>0.85)	182	75.8

BMI=Body Mass Index, WHR=Waist-hip ratio

Food consumption pattern

The frequency of consumption of different food groups showed that the women consumed foods rich in roots and tubers twice a week (38.3%) followed by daily consumption (20.84%). The highest percentage (36.0%) rarely consumed legumes while 34.67% consumed them twice a week. More than one third (36.1% and 35.6%) consumed starchy fruits twice a week and rarely, respectively. Cereals were rarely (42.7%) consumed while 28.3%, 14.2% and 14.8% consumed them twice a week, daily and thrice a week, respectively. Green leafy vegetables were mainly consumed twice a week and daily by 41.5% and 21.1%, respectively by the women. Consumption of meat, poultry and fish products was 31.5%, 39.7%, 15.5% and 13.3% for twice a week, rarely, daily and thrice a week, respectively. Baked products were consumed twice a week (40.4%) and daily (22.4%) by the women. Milk and dairy products were commonly consumed twice week (32.9%), 28.1% rarely consumed it while 24.8% and 14.2% consumed it daily and thrice a week, respectively. Consumption of fat and oil products was mainly twice a week (33.9%) and daily (25.8%). Others rarely consumed it (22.5%) or did thrice a week (17.8%).

Table 5. Food consumption pattern of the market women

Food type	Daily (%)	Twice a week (%)	Thrice a week (%)	Rarely (%)
Roots and tubers (eg	50 (20.8)	92 (38.3)	223 (9.4)	75 (31.5)
Legumes	40 (16.7)	83 (34.7)	30 (12.7)	87 (36.0)
Starchy fruits	29 (12.2)	87 (36.1)	39 (16.1)	85 (35.6)
Cereals	34 (14.2)	68 (28.3)	35 (14.8)	103 (42.7)
Green leafy vegetables	50 (21.1)	100 (41.5)	42 (17.6)	48 (19.9)
Fruits	34 (14.3)	69 (28.8)	42 (17.4)	95 (39.6)
Meat, poultry and fish	37 (15.5)	76 (31.5)	32 (13.3)	95 (39.7)
Baked products	54 (22.4)	97 (40.4)	46 (19.4)	43 (17.9)
Milk and dairy products	59 (24.8)	79 (32.9)	34 (14.2)	68 (28.1)
Fats and oils	62 (25.8)	81 (33.9)	43 (17.8)	54 (22.5)

Discussion

The result of this study showed that half of the respondents were within the reproductive age with the range of less than 40 years and were married. Majority of the respondents (90%) had one form of education or the other with secondary education accounting for a higher proportion. The level of secondary education reported in this study is similar to 38% reported among a group of market women in Ikosi-isheri, Lagos state (Akinloye, 2010).

The market activities revealed the women woke up quite early (before 6.00am) to prepare for the market. The early wake up time of these traders may not be unconnected with the fact that they have to prepare their children for school and probably prepare meals for them. Most of the respondents go to the market up to six times in a week. The frequency of going to the market indicated that the women were full time traders whose livelihoods probably depended on the proceeds from their sales. The implication of this is that the better part of the whole day is spent in the market place while family activities are minimized. Market activities for majority (60%) of the women involved sitting for up to six hours a day. Although, some equally reported walking around in the market, there is however a possibility that the women may have overestimated their walking activities. This is because the market in question is not a very large one

coupled with the fact that the respondents sampled were mainly those that had shops, stalls or sold by the roadside with their umbrella and not necessarily hawkers. Again, walking activities of the women may not necessarily be in the form of vigorous physical activity that could lead to weight loss. The fact that most of the respondents perceived their activity level and market activities to be physically active and very stressful might be linked to either ineffective management of time or lack of sleep during the day (siesta) .

The meal usually missed by most of the respondents was breakfast and the main reason for skipping it was due to lack of time to either prepare or eat the meal. The role of women in carrying out household chores coupled with their income generating activities may point to the fact that they may not have the time for food preparation early in the morning. Even when they do prepare the meals, their busy schedule may not allow them partake of such meals. Ming *et al.* (2006) noted that breakfast is the most important meal of the day that replenishes the body and brain after a night's fast. Skipping of breakfast by the women may mean that they may tend to over eat at the next meal and this might make them add weight coupled with their sedentary lifestyle. Consumption of snacks, baked products and fat and oil was on the high side as many of them consumed one form of high fat dense snack or the other on a daily basis. This could be due to its ready availability in the market. Market women while waiting for their customers may want to take snacks in between meals either to satisfy their appetite or enjoyment for food. Consumption of snacks high in saturated fat could lead to deposition of dietary fat in the fat stores of the adipose tissues and thus increase the chances of an individual getting over weight or obese. The relationship between BMI and snack consumption corroborates reports of other authors (Poulain, 2002; Piernas and Popkin, 2010) which found that frequent consumption of snacks is strongly associated with the rising rates of obesity. Similarly, WHO (2010) noted that people may become overweight or obese due increased consumption of foods which contain high levels of sugar and fat. From the food consumption pattern (Table 5), most of the foods in the food groups were consumed more twice a week. The high rate of consumption of green leafy vegetables could be attributed to the availability of fresh green vegetable during the rainy season when this study was conducted between (June and July, 2012). Similarly, the high consumption could be attributed to the fact that the West African diet consists mainly of mixed dishes of green leafy vegetables served as accompaniment to cereals, root and tuber staples (Oniang'o *et al.,* 2003). Consumption of fruits was rather low in this study. This corroborates results of Ganasegeran *et al.* (2012) which reported that most of their respondents consumed fruits less than three times a week. As pointed out (Oniang'o *et al.,* 2003), low consumption of fruits among Africans from infancy to adulthood could be attributed to factors such as income, educational level, place of residence (rural or urban), ignorance and seasonality. Alcohol consumption was high as most of the market women noted they consumed the brand "stout". Too much consumption of alcohol is a predisposing factor to obesity and can as well lead to a cluster of other cardiovascular diseases.

Based on BMI classification, the prevalence of overweight and obesity combined was 56.6% (25% and 31.7%, respectively). The high rate of overweight and obesity maybe a reflection of the sedentary lifestyle of the market women since the better part of their day was made up of sitting activities. The rate of obesity reported in this study was lower than 69% reported among a group of market women in Abeokuta (Mebude, 2010), but higher than 16.3% reported among female traders in Ibadan (Balogun and Owoaje, 2007. The differences in rates may be related to differences in genetic make up and socioeconomic status of the three different groups of market women. The high prevalence of overweight and obesity among female traders in this study could also be attributed to cultural norms in Africa where being fat is associated with affluence, beauty and healthy living (Okafor *et al.,* 2015). Ojo *et al.* (2011) reported that waist size reflects growing evidence of visceral fat surrounding the abdominal organs and also increases the rate of heart diseases. Using WHR classification, more than half (75.8%) was at risk of abdominal fat accumulation. Oladoyinbo *et al.* (2015) in a study of traders in South west Nigeria reported a prevalence of 83.9% for abdominal obesity among female traders. This study has limitations in that the sample size was relatively small and only one major market in Umuahia metropolis was sampled. Therefore, other major markets in the state need to be sampled to provide more information on the nutritional status and market activities of female traders. Due to dearth of information on abdominal obesity among market traders, it was difficult to make further comparisons regarding abdominal obesity.

Conclusion

The rate of overweight and obesity were high. The market and lifestyle activities could be regarded as sedentary. The study underscores the need for educational campaigns regarding healthier lifestyles, diversification of diet, weight management and control to be conducted regularly in various markets.

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Conflict of interest

There is no conflict of interest.

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