
Food Habits and Anthropometric Status of Older Persons in Afikpo South Local Government Area of Ebonyi State

***Nzeagwu, O. C and Ukeni, C. S**

Abstract

Nutrition and health risks increase with age even as the number of older persons increased. This cross-sectional study assessed food habits and anthropometric status of 244 persons aged ≥ 65 years from four development areas in Afikpo LGA of Ebonyi state using multi-stage random sampling. Structured, validated and pretested questionnaire was used to elicit information on socio-economic status and food habits. Weight, height, waist circumference, hip circumference, skin fold thickness were measured using standard procedures. Body mass index (BMI) and waist-hip ratio (WHR) were calculated; all parameters were compared with standards. Data was analyzed using IBM SPSS Statistics version 20.0. The percentage of females (58.6%) was higher than males (41.4%). Most (53.7%) earned incomes from maintenance allowances from children/relatives. Majority (85.7%) consumed fruits. Loss of appetite (39.0%) and financial constraints (36%) were the major factors that limited their increased fruit consumption. Majority (93.9% and 66.4%) neither smoked nor take alcohol/snuff respectively. About 64% skipped a meal daily. Anthropometric status revealed that (41.4%) had normal BMI, while 32.4% were underweight and 20.9% were

**Nzeagwu, O. C and Ukeni, C. S*

*Department of Human Nutrition and Dietetics
Michael Okpara University of Agriculture, Umudike
PMB 7267 Umuahia, Abia State Nigeria*

**Corresponding author: email address: ogechinzeagwu@gmail.com*

overweight. Most (71.7%) had moderate WHR while the rest (28.2%) were at increased risk of malnutrition. In terms of triceps skin fold (34.1%) were underweight, 44.7% were normal, 21.3% were overweight. Significant relationship ($P < 0.05$) existed between BMI and sex ($X^2 = 13.46$; $p = 0.03$), BMI and age ($X^2 = 52.13$; $p = 0.04$) triceps skinfold and age ($X^2 = 47.55$; $P = 0.04$), WHR and age ($X^2 = 5.84$; $p = 0.03$). Almost half (51.6%) of the respondents consumed roots and tubers weekly, (48.5%) consumed legumes weekly. All (100%) respondents consumed various sea foods while 25% consumed meat daily. About 60.2% of respondents consumed vegetables weekly. The study revealed that majority skipped meals, daily fruit consumption was low and different levels of malnutrition existed.

Keywords: food, habits, anthropometric status, older persons, food consumption

Introduction

Food habits of individuals and populations can be described by usual food behaviors like frequency, quantity and types of foods usually consumed on average over a period of time (Ingrid *et al.*, 2007). As a person grows older, his organs show reduced ability to perform physiological functions and this is because there is cell loss and reduced cell metabolism (Shubhangini, 2010). The older persons can be an essential part of the family by passing on their enriched life experiences to the young family members, thus aiding to equip these young fellows to face life challenging problems as they get older (Shubhangini, 2010). Ageing process affects nutrient needs for example, while requirements for some nutrients may be reduced, requirements for other essential nutrients may rise in later life (WHO, 2014). Normal aging causes multiple physiologic changes that affect nutrient needs and nutritional status as well as evident loss of bone, muscle mass and strength as people age (Paul *et al.*, 2002). Some changes that take place in old age which may affect food pattern include decreased secretion of digestive juices, decreased motility of the gastro intestinal tract and decreased absorption and utilization of nutrients as well as difficulty in chewing most foods (Shubhangini, 2010). These may expose the older persons to diseases

like cardiovascular and cerebrovascular disease, diabetes, osteoporosis and cancer which are all diet related (WHO, 2015). Wendy *et al.* (2007) reported that the quality of older people's diet decline on average with increasing age for both men and women. Micronutrient deficiencies which are often common in older persons are due to a number of factors like prices of foods rich in micronutrients, reduced food intake and lack of variety in the foods they eat (WHO, 2015). Relatively modest reductions in saturated fat and salt intake, which would reduce blood pressure and cholesterol concentrations, could have a substantial effect on reducing the burden of cardiovascular disease and increasing consumption of fruit and vegetables by one to two servings daily could cut cardiovascular risk by 30% (WHO, 2014). Osemeka (2010) predicted that by 2050, older persons are expected to reach the 2 billion mark which will be more than that of children <14 years and that this rapid increase in the older population calls for a deep concern in their health and nutritional status especially as traditional living arrangements are changing and values that used to ensure that older persons were cared for and protected are crumbling in Africa (Osoemeka, 2010). WHO (2015) reported that adult mortality in Africa is still very high when compared to any other regions in the world and it is higher in low income countries like Nigeria. This could be due to decreased immune function, loss of cognitive function and deteriorating vision, all of which hinder good health and dietary habits in old age (WHO, 2014). Food habits can also be affected by food flavor, texture, appearance and preferences, culture and beliefs, lifestyles, routines and habits, cost and availability (Byrd-Bredbenner *et al.*, 2013). All these may likely influence nutritional status. Therefore, an increasing understanding of the factors that contribute to poor nutrition in the older persons should enable the development of appropriate preventive and treatment strategies and improve the health of older people (Donini *et al.*, 2003). Thus, the objective of the study is to assess the food habits and anthropometric status of the older persons 65 years and above.

Materials and methods

Study design: The study is a cross-sectional survey of randomly selected older persons using multi-stage sampling technique.

Area of study: The study was carried out in Edda in Afikpo South local government area of Ebonyi state. Edda has four development areas made of autonomous communities with small villages. They are predominantly farmers cultivating mostly vegetables, rice, yam, cassava, and cocoyam which are also consumed (EWL, 2013).

Population of the study: Population of the study comprised older persons (both male and females) \geq 65 years who are resident in the eleven autonomous communities in Afikpo South LGA.

Sample size: The sample size of the study was calculated using the percentage of older persons \geq 65 years in Nigeria reported as 4.0% and predicted to rise up to 6.0% and 9.9% in 2025 and 2050 respectively (WHO, 2012). The estimated population of the older persons was used to determine the sample size (N) using the formula as documented by (Areoye, 2003): $N = \frac{Z^2 \cdot P (100 - P)}{X^2}$

X^2

Where N = Sample Size; Z = Confidence interval taken as 1.96 or 2 approximately

P = Percentage of the older persons in Nigeria which is 4.0%

X = Width of confidence interval at 5% level of probability

$N = \frac{2^2 \times 4.0 (100 - 4.0)}{5^2}$

$5^2 N = 61.44$ approximately 61; Thus, total sample size was 61 multiplied by the four (4) development centers. Therefore, the total sample size was 244

Sampling procedure: The communities were selected by random sampling using balloting and one out of the two or three communities was selected to represent each development center. The market, the churches and the community squares were the major places of meeting the respondents. Sixty-one respondents were

selected from each of the communities from the four development centers in the LGA.

Preliminary visits: Prior to the commencement of the study, preliminary visits were made to the traditional rulers and village heads of the selected communities to inform them of the study and to seek their consent to use their subjects.

Informed consent: No adverse reactions were expected as the participants were only interviewed and measured and no invasive procedures were carried out. However, informed consent of the respondents was sought and only those who consented were used for the study.

Training of research assistants: Four research assistants were used to help the respondents fill the questionnaire and in the anthropometric measurements.

Data collection: Validated pre-tested questionnaire was used to elicit information on demographic, socio-economic, food habits and food consumption pattern of the respondents. The questionnaire was structured such that with little explanation both literate and non-literate respondents can complete the questionnaire without stress. Respondent's food intakes were assessed using food frequency questionnaire. All the anthropometric measurements were carried out using the methods described by (WHO, 1995). Weight was measured using the portable Hanson model bathroom scale and the reading was taken to the nearest 0.1 kg. The subject was made to stand without shoes and wearing light clothes. Locally produced stadiometer was used for measuring height for those without kyphosis, done by using a constructed vertical wooden rod with measuring tape and a head board measured to the nearest 0.1 m. In the subjects that had kyphosis, non-stretch flexible fibre tape was used to measure their arm span which was used as proxy for height. The Waist Circumference was measured as the subjects were made to stand with the feet apart. The measurement was taken midway between the upper hip bone and the uppermost border of the right iliac crest. The tape was placed and reading taken when the tape is snug but does not compress the skin and underlying soft tissues.

The circumference was measured to the nearest 0.1cm at the end of normal expiration. The hip circumference was measured when the subject was standing erect with arms at the sides and feet together wearing light dressing around the hip. The tape was placed around the buttocks in a horizontal plane. The tape was snug against the skin but did not compress the soft tissue. The measurement was recorded to the nearest 0.1 cm. The triceps skin fold was done using the Harpenden (slimguide) skinfold caliper. This was done by first identifying the mid-point between the acromion and olecranon process positioned on the posterior midline of the upper arm of the left arm when the elbow is flexed at 90°C. The skinfold was picked up between the forefinger and the thumb of the left hand in the midline parallel to the long axis of the upper arm to the nearest 0.2 mm. Three measurements were taken for all and the mean calculated. The respondent's food intakes were assessed using the food frequency questionnaire which comprised a list of foods consumed in Afikpo South LGA.

Data analysis: The body mass Index (BMI) was calculated as weight (kg) divided by height (m²) and compared with standards as cited by WHO (1995). The other parameters were analyzed using the standards as documented by different authors—Waist Circumference (WC) (WHO, 2008), waist-hip ratio (WHR) (CDC, 2012) and triceps skinfold (Frisancho, 1974).

Statistical analysis: The information gathered from the questionnaire and anthropometric measurements were coded and entered in to the computer using IBM SPSS Statistics version 20.0. Descriptive statistics such as frequencies and percentages were used to analyze the data. The relationship between the respondent's socioeconomic characteristics and their anthropometric status was determined using cross tabulation and chi-square tests.

Results

Information on respondent's socio-economic status is summarized in Table 1. Most of the respondents were either between 65-70 years (49.2%) or 71-75 years (32.8%). The percentage of older females (58.6%) was higher than the males (41.4%). About half (51.5%) of the males were widowers and 56.6% of the females were widows.

Some (32.0%) were traders and farmers (31.6%). About 28.7% had no formal education while the rest had one form of education or the other. Few (37.7%) lived with their spouses. About half (51.2%) of the respondents earned incomes below ₦5,000, some (34.0%) earned incomes between ₦5,000 - ₦10,000 while the rest (14.8%) earned income above ₦10,000. More than half (53.7%) earned incomes from maintenance allowances from children/relatives, while others (27.5%) got theirs from casual and menial jobs and (20.5%) from pensions.

On food habits (Table 2), most (85.7%) of the respondents (82.2% males and 88.1% females) claimed they consume fruits; daily (17.3%), twice weekly (38.5%) and once weekly (29.9%). Loss of appetite (39.0%) and financial constraints (36%) were the major factors that limited their increased fruit consumption. Majority (93.9% and 66.4%) of the respondents does not smoke nor take alcohol/snuff respectively. Only 36% eat three meals every day, the rest skipped one meal or the other.

The anthropometric status (Table 3) revealed that some (41.4%) had normal BMI status, while 32.4% were underweight among which 16.8% were males and 15.6% were females. About 20.9% (6.6% males and 14.3% females) were overweight. Most (71.7%) of the respondents had moderate waist-hip ratio while the rest (28.2%) were at increased risk of malnutrition. Triceps skin fold values showed that some (34.1%) of the respondents were underweight and about 44.7% were normal. Only 21.3% of them were overweight.

Table 4 shows the relationship between respondent's anthropometric status and socio-economic and demographic variables. The results revealed that a significant relationship ($P < 0.05$) existed only between BMI and sex ($X^2 = 13.46$; $p = 0.03$), BMI and age ($X^2 = 52.13$; $p = 0.04$), triceps skinfold and age ($X^2 = 47.55$; $P = 0.04$) as well as WHR and age ($X^2 = 5.84$; $p = 0.03$).

Food frequency consumption (Table 5) showed that almost half (51.6%) of the respondents consumed at least one of the roots and tuber crops weekly, while some (36.7%) consumed them seasonally. Consumption of cereals revealed that some (47.4%) consumed any of the cereals daily. Some (48.5%) consumed any of

the legumes weekly. Some (42.8%) consume one form of the sea foods or the other daily and 31.3% weekly. Few (25%) of the respondents consume meat every day, 29.5% weekly and 20.5% monthly. Fruit consumption showed that 17.3% eat fruits daily, 68.4% consume fruits weekly while 14.3% eat fruits when in season. Some (39.8%) consume vegetables daily while most of the respondents (60.2%) consume vegetables weekly.

Table 1: Socio-economic status of the respondents

Parameters	Male		Female		Total	
	F	%	F	%	F	%
Age (in years)						
65-70	54	53.5	66	46.15	120	49.2
71-75	29	28.7	51	35.7	80	32.8
76-80	15	14.8	21	14.7	36	14.7
>80	3	3.0	5	3.5	8	3.2
Total	101	100	143	100	244	100
Marital status						
Married	41	40.6	51	35.7	92	37.7
Widowed	52	51.5	81	56.6	133	54.5
Divorced	8	7.9	11	7.7	19	7.8
Total	101	100	143	100	244	100
Occupation						
Farming	39	38.6	38	26.6	77	31.6
Trading	18	17.8	60	41.96	78	32.0
Pensioner	30	29.7	16	11.2	46	18.8
Others	14	12.9	29	20.3	43	17.6
Total	101	100	143	100	244	100
Residence						
Urban	15	14.9	49	34.3	64	26.2
Rural	86	85.1	94	65.7	180	73.8
Total	101	100	143	100	244	100
Education						
No formal education	19	18.8	51	35.7	70	28.7
Primary education	41	40.6	52	36.4	93	38.1
Secondary education	23	22.8	31	21.7	54	22.1
Tertiary education	18	17.8	9	6.3	27	11.1
Total	101	100	143	100	244	100

Live with spouse						
Yes	47	46.5	45	31.5	92	37.7
No	54	53.5	98	68.5	152	62.3
Total	101	100	143	100	244	100
Source of income						
Profit	22	21.8	45	31.5	67	27.5
Pension	30	29.7	16	11.2	46	20.5
Maintenance allowance from children/relatives	49	48.5	82	57.3	131	53.7
Total	101	100	143	100	244	100
Monthly income						
d" ₦5,000	46	45.5	79	55.2	125	51.2
₦ 6,000- ₦10,000	34	33.7	49	34.3	83	34.0
Above ₦10,000	21	20.8	15	10.5	36	14.8
Total	101	100	143	100	244	100

Table 2: Food habits of respondents

Parameter	Male		Female		Total	
	F	%	F	%	F	%
Do you eat fruit						
Yes	83	82.2	126	88.1	209	85.7
No	18	17.8	17	11.9	35	14.3
Total	101	100	143	100	244	100
Frequency of eating fruits						
Everyday	13	12.9	29	20.3	42	17.3
Once a week	31	30.7	42	29.4	73	29.9
Twice a week	39	38.6	55	38.4	94	38.5
Not applicable	18	17.8	17	11.9	35	14.3
Total	101	100	143	100	244	100
Factors affecting fruit consumption						
Finance	17	16.8	36	25.2	53	21.7
Appetite	31	30.7	64	44.7	95	39.0
Availability	22	21.8	17	11.9	39	16.0
Like/Dislikes	13	12.9	9	6.3	22	9.0
Not applicable	18	17.8	17	11.9	35	14.3
Total	101	100	143	100	244	100
Whether respondents take alcohol, snuff etc.						
Yes	49	48.5	33	23.1	82	33.6
No	52	51.5	110	76.9	162	66.4
Total	101	100	143	100	244	100

Frequency of daily consumption						
Once	31	30.7	34	23.8	65	26.6
Twice	37	36.6	54	37.7	91	37.3
Thrice	28	27.7	44	30.8	72	29.5
Four	5	5.0	11	7.7	16	6.6
Total	101	100	143	100	244	100
Meals usually skipped						
Breakfast	8	7.9	9	6.3	17	7.0
Lunch	17	16.8	29	20.3	46	18.8
Dinner	12	11.9	16	11.2	28	11.5
Breakfast and lunch	19	18.8	18	12.6	37	15.2
Breakfast and dinner	12	11.9	16	11.2	28	11.5
None	33	32.7	55	38.4	88	36.0
Total	101	100	143	100	244	100
Person responsible for food preparation						
Myself	4	4.0	43	30.1	47	19.3
Spouse	35	34.6	0	0	35	14.3
Children	32	31.7	27	18.9	59	24.2
House help	30	29.7	73	51.0	103	42.2
Total	101	100	143	100	244	100
Do you smoke	101	100	143	100		
Yes	13	12.9	2	1.4	15	6.1
No	88	87.1	141	98.6	229	93.9
Total	101	100	143	100	244	100

Table 3: Anthropometric Status of the Respondents

Parameters	Male		Female		Total	
	F	%	F	%	F	%
BMI status						
Underweight; <18.50	41	40.60	38	26.60	79	33.60
Normal; 18.50 - 24.99	42	41.60	59	41.30	104	41.50
Overweight; 25-29.99	16	15.80	35	24.50	48	20.20
Obese; 30 and above	2	2.00	11	7.70	13	4.90
Total	101	100	143	100	244	100
Waist circumference						
At risk; >94cm (M); >80cm(F)	29	28.70	35	24.50	64	26.60
Increased risk; >102cm (M); >88cm(F)	72	71.30	108	75.50	180	73.40
Total	101	100	143	100	244	100

Waist and Hip ratio						
Moderate; $d > 0.09$ (M); $d > 0.07$ (F)	84	83.20	91	63.60	178	73.40
Increased risk; > 1.0 (M); > 0.80 (F)	17	16.80	52	36.40	66	26.60
Total	101	100	143	100	244	100
Triceps Skin fold						
Underweight; < 7 mm (M); < 12 mm(F)	47	46.50	36	25.20	80	35.90
Normal; 7-12mm (M); 12-20mm(F)	36	35.60	73	51.00	112	43.30
Overweight; > 12 mm (M); > 20 mm(F)	18	17.80	34	23.80	52	20.80
Total	101	100	143	100	244	100

Key: (M) Represents Male and (F) Represents Female

Table 4 Relationship between respondent's anthropometric parameters and socio-economic status

Parameters	BMI status of respondents						Triceps skin fold						Waist and hip ratio					
	Under weight	Nor mal	Overweight	Obese	Total	X ² , P-value	Under weight	Nor mal	>nor mal	Total	X ² , P-value	Moderate	Increased risk	Total	X ² , P-value			
Age (yrs)						52.13; 0.04					47.55; 0.04				31.02; 0.07			
65-70	25	37	27	8	97		13	57	27	97		61	36	97				
71-75	25	30	11	3	69		35	19	15	69		55	14	69				
76-80	12	14	8	2	36		13	20	3	36		24	12	36				
>80	17	23	2	0	42		19	16	7	42		38	4	42				
Total	79	104	48	13	244		80	112	52	244		178	66	244				
Sex						13.46; 0.03					11.32; 0.06				5.84; 0.03			
Male	48	28	21	4	101		34	49	18	101		67	34	101				
Female	31	76	27	9	143		46	63	34	143		111	32	143				
Total	79	104	48	13	244		80	112	52	244		178	66	244				
Marital status						23.57; 0.38					25.60; 0.41				21.16; 0.44			

Married	16	48	19	9	92		26	48	18	92		38	54	92	
Widowed	55	49	25	4	133		46	61	26	133		130	3	133	
Divorced	8	8	3	0	19		8	3	8	19		10	9	19	
Total	79	104	48	12	244		80	112	52	244		178	66	244	
Occupation						35.42; 0.12						32.17; 0.24			20.19; 0.37
Farming	16	11	5	3	33		14	14	7	35		29	6	35	
Trading	11	47	13	7	78		25	39	14	78		64	14	78	
Pensioner	19	20	7	0	46		6	25	15	46		32	14	46	
Unemployed	31	23	21	2	77		33	30	14	77		53	24	77	
Others	2	3	2	1	8		2	4	2	8		0	0	8	
Total	79	104	48	13	244		80	112	52	244		178	66	244	

38	3	64	39	25	64	6.83; 0.06
74	49	180	139	41	180	
112	52	244	178	66	244	
						29.47; 0.13
31	18	70	38	32	70	
47	16	93	67	26	93	
19	14	54	33	21	54	
15	4	27	40	13	27	
112	52	244	178	66	244	
						13.53; 0.08
53	9	92	55	37	92	
59	43	152	123	29	152	
112	52	244	178	66	244	

Table 5: Food Frequency Consumption of Respondents

	Food consumption frequency of respondents (%)				
	daily	Weekly	monthly	Seasonally	Never
Roots/tuber	29(11.9)	125(51.6)	□	90(36.7)	□
Cereals	116(47.4)	72(29.4)	32(13.3)	24(9.9)	□
Legumes	24(9.7)	118(48.5)	98(40.3)	4(1.5)	□
Fruits	42(17.3)	167(68.4)	□	35(14.3)	□
Meat	61(25.0)	72(29.5)	50(20.5)	16(6.6)	□
Sea foods	104(42.8)	76(31.3)	□	62(25.3)	□
vegetables	97(39.8)	118(48.5)	98.3(40.3)	□	4(1.5)

Note: All figures in bracket are percentages

Discussion

The greater percentage of females than males in this study could be because there is higher mortality rate in older males than females and females most times live 10 years longer than males (Thomas and Fretts, 1998). Katsuiku (2013) reported that biologically, women live longer than men because the rate of decline of most T-cell and B-cell lymphocytes are faster in males than in females and also that men show a more rapid decline in two cytokines - Interleukin-1 (IL-1) and Tumor necrosis factor alpha (TNF- α). It has also been reported that two specific types of immune system cells that attack invaders (CD4-T-cells and natural killer cells) increase in number with age, with higher rate of increase in women than in men (Katsuiku, 2013). Another reason may be due to the fact that most males of this age participated actively in the Nigeria-Biafra civil war of 1967-1970 and thus may have lost their lives in the war. More than half of the respondents that were widowed may be due to the fact that at this age, there is greater probability for one of the spouse to be late, also the older persons are faced with some health challenges (such as elevated blood pressures, cardiovascular diseases, cancers, and osteoporosis), which is life threatening (Paul *et al.*,

2002). The occupation of the respondents may have been influenced by their residence as they were mostly rural dwellers, and therefore majorly involved in farming and trading. The low educational attainment of the respondents could also be as a result of their location. The income level could also be a clear reflection of their educational status because as educational status increases, income also increases and to a great extent income affects food choices and habits of individuals (Byrd-Bredbenner *et al.*, 2013). It is not surprising that more than half of the respondents are maintained by either their children or relatives. The Igbo culture and the extended family system could explain this as children see it as their responsibility to take care of their aged parents. Shubhangini (2010) had earlier suggested that older people depend on others to meet their day to day needs. The low income recorded in this survey could be as a result of the fact that older persons lack the strength and vigor to embark on hard task that will attract high income and also there could be low payment due to reduced dexterity and work capacity that happens to people as they get older (Shubhangini, 2010). Some may have also retired from active service and only survive with the help of their children and relatives.

The food habits showed that some consumed fruits daily, twice weekly or weekly and loss of appetite and financial constraints were the major factors that limited their increased fruit consumption. Byrd-Bredbenner *et al.* (2013) had reported that some of the factors that affect food habits include finance and appetite. Fruit and vegetable consumption reduce the risk of several chronic diseases (WHO, 1990; Key *et al.*, 1996). The World Health Organization recommends the consumption of at least 400g, or five portions, of fruit and vegetables a day (WHO, 2006). There is low daily (17.3%) consumption of fruits in this study which is less than the recommendations for an adequate diet. The loss of appetite (39.0%) recorded in this survey is not surprising as it is one of the many physiological changes associated with ageing as reported (Abiodu *et al.*, 2011). The percentage of the respondents that skipped one meal or the other is worrisome which could be attributed to loss of appetite or availability of people to prepare and serve the food or even availability of the food. Stevenson (2014) noted different factors

that affect appetite of older persons as lack of interest in food due to changing taste buds, depression or loneliness, lack of energy to cook, health conditions and medication side effects. It has also been reported that vision loss makes shopping, preparing food, and even eating more difficult and diminished taste and smell take away the appeal of many foods and may lead to preparing or consuming food that is no longer safe (Tabloski, 2006). The high dependency on house-helpers and children could be due to reduced activity as a result of loss of strength. The low rate of smoking and alcohol consumption in this study is commendable because smoking, alcohol and snuff is one of the leading causes of cancer and other cardiovascular diseases as it deposits harmful toxins into the body (NCI, 2015).

Some of the respondents were underweight, others were overweight and fewer were obese from the BMI results showing levels of malnutrition with more females being malnourished. This agreed with earlier report that older persons are particularly vulnerable to malnutrition (WHO, 2014). However, a higher percentage had normal BMI which agreed with some reports from some other studies in older persons (Nzeagwu and Uwaegbute, 2013; Nzeagwu and Ebere, 2016). This could be from the percentage that reported not skipping meals because decreased food intake affects the nutritional status of older persons (Morley, 1997). Most of the respondents (73.8%) were at increased risk of cardiovascular diseases with more females than males using WC. This could be because abdominal or central obesity increases with advancing age and is associated with an increased risk of diseases (Despres, 1996). The WHR results also revealed that more females had increased risk of heart diseases than the older men, but this also does not give much explanation to why older males die faster than older females because Katsuiuku (2013) reported that even though there is higher mortality rate among men than women, women still had higher hospital records of people suffering from age related diseases such as cardiovascular diseases. This result of higher WHR of females than males is not at variance with earlier observations (Mitchel-Eady and Chernoff, 2006; Nzeagwu and Uwaegbute, 2013; Nzeagwu

and Ebere, 2016). This could be because females store more fat in the abdominal region (Rossman, 1997).

The significant relationship that existed between BMI and age could be because ageing affects nutrition needs and nutrient intakes thus when food intake is reduced due to loss of appetite that accompanies ageing, there will be relative reduction in energy and fat deposition, loss of bone mass leading to reduction in height which will affect weight and invariably affect a person's BMI index adversely (Paul *et al.*, 2002). The significant relationship between BMI and sex is a proof that BMI status is also influenced by sex. Paul *et al.* (2002) noted that BMI is affected by the gender of a person. Triceps skin fold was also affected by age because triceps skin fold measures fat under the skin and as people age, there is reduction in body fats generally. The relationship between respondent's age and WHR could be because WHR is used to determine fat in the abdominal and waist region, and since there is usually reduction of fats as people age, there would no doubt be alterations in the WHR as people age (Paul *et al.*, 2002). All other socio-economic factors assessed in this study had no relationships with the anthropometric parameters.

The high consumption of foods in the root and tuber group could be because they are staple foods in the area and mostly consumed. This is also true for the consumption of cereals. Legume consumption was high though on weekly basis. Choice has been identified as one of the major factors that affect food habits (Doniniet *al.*, 2003). Daily consumption of sea foods was moderate because fish is one of the cheapest animal sources of protein and this could explain why most of the respondents consumed it daily. This could also be because most dishes are usually cooked with crayfish or other sea foods like periwinkles. The cost of meat could have affected the daily consumption. There was low daily consumption of fruits; however, weekly consumption was high. The high daily and weekly consumption of vegetables could be due to seasonal availability of some of these vegetables as well as their inclusion in the soups and sauces used for most of the staple foods. Lack of proper knowledge about the need and recommended daily intake of fruits and

vegetables could be one reason why most of the respondents do not consume them regularly as required.

Conclusion

Most of the respondents skip one meal or the other. Most consumed fruits but daily consumption was low. Majority does not smoke or consume alcohol. Some of the respondents had normal BMI, yet some were underweight and others overweight. The WHR revealed that majority had moderate WHR although some were at increased risk of malnutrition. A significant relationship existed between BMI and sex, BMI and age and triceps skinfold and age. Therefore, effort should be made to encourage good food habits among older persons to avoid meal skipping, but eat adequately and thus improve nutritional status.

References

- Abiodun, M. G., Adekeye, O. A., Iruonogbe, T.C (2011). Counselling services for remediating the biopsychosocial challenges of the aged in Nigeria. *J. Funct. Mang.* 3(1): 89–98.
- Areoye, M.O (2003). Research methodology with statistics for health and social sciences Nathadex publishers, Nigeria. Pp117-119
- Byrd-Bredbenner. C., Moe, G., Beshgetoor, D. and Berning, J. (2013). *Wardlaw's perspectives in Nutrition*. McGraw-Hill press, New York .Pp14.
- Centre for Disease Control (CDC) (2012). Racial Ethnic Disparities in prevalence, Treatment and Control. Centre for Disease Control, United States. <http://www.cdc.gov/nchs/nhanes.htm>
- Despress. J. P., Lamarche, B and Mauriege, P. (1996). Hyperinsulinemia as an independent risk factor for ischemic heart disease. *N. Engl. J. Med.* 334; 952 – 957.
- Donini, L. M., Savina, C., and Cannella, C. (2003). Eating habits and appetite control in the elderly: the anorexia of aging. *Intl. Psych. J.* 15:73-87.
- EWL (Edda Women's League) (2013). Recipe of Nri-Ndi Edda. In: Nri- Edda: Good tiding Press. Abakaliki. Pp5.
- Frisancho, A. R. (1974). Triceps skinfold and upper arm muscle size norms for assessment of nutritional status. *Am. J. Clin. Nut* 27:1052-1058
- Ingrid, R., Karen, W. and Geoffrey, M. (2007). Monitoring the food and nutrition situation of populations; Mark, L., Tony, W. (Eds). Open University Press McGraw Hill Edu. Berkshire England. Pp288-289.
- Katsuiku, H. (2013). Biological clue to why women live longer than men-BBC News; <http://www.bbc.com/news/health-22528388>. (Accessed:09/19/2015).
- Key, T. J. A., Thorogood, M., Appleby, P. N. and Burr, M.L. (1996) Dietary habits and mortality of 11,000 vegetarians and health conscious people: results of a 17 year follow up. *Br. Med. J.* 31(3):775-779.

- Marinos, E. (2009). Malnutrition in our older population and the public health consequences. *Nutrition and Health in an Ageing Population*. 3rd December 2009,(1):Pp9-10.
- Mitchel-Eady, C.O and Chernoff, R. (2006). Nutritional assessment of the elderly. In: *Geriatric Nutrition. The Health Profession's Handbook*. 3rd ed. Jones and Bartlett Publishers Inc. USA. Pp 427 – 458.
- Morley, J.E. (1997). Anorexia of aging: physiologic and pathologic. *Am. J. Clin. Nut.* 6(6):760-73.
- National Cancer Institute (NCI) (2015). Tobacco-National Cancer Institute; <http://www.cancer.gov/about-cancer/causes-prevention/risk/tobacco>. (Accessed: 09/19/2015).
- NCI (National cancer institute), (2015). Tobacco-National cancer institute; <http://www.cancer.gov/about-cancer/causes-prevention/risk/tobacco> (Accessed 19/09/2015)
- Nzeagwu, O. C and Uwaegbute, A. C. (2013). Assessment of the nutritional status of the elderly in two local government areas of Abia state, Nigeria. *Nig J Nutr Sci* 34:63 - 72.
- Nzeagwu, O. C and Ebere, U. C. (2016). Assessment of nutritional vulnerability of the elderly using mini nutritional assessment (MNA) tool and malnutrition universal screening tool (MUST): *J Diet Assoc Nig.* 7:44 – 51.
- Osemeka, C. A. (2010). Managing behaviors and emotional issues in older people; <http://www.medwelljournals.com/fulltext/?doi=sscience.2010.401.413> (Accessed: 09/6/2015)
- Paul, I., Elaine, R. T., Don, R. (2002), *Nutrition update*. Jones and Bartlett publishers, Sadbury Massachusetsts. Pp57-58
- Shubhangini, A. J. (2010). *Nutrition and Dietetics with Indian case studies*: Tata McGraw Hill education private limited, New Delhi 110008. Pp180-181
- Stevenson, S. (2014). Loss of Appetite in the Elderly: Causes and how to cope; <http://www.aplaceformom.com/blog/01-23-2013-loss-of-appetite-in-elderly/> (Accessed: 09/19/2015)

- Tabloski, P. A. (2006). Nutrition and aging. In: P. A. Tabloski, Gerontological Nursing. Up Saddle, NJ: Prentice Hall. Pp 110–146
- Thomas, P. and Fretts, R. (1998). Why women live longer than men. <http://www.sciam.com/1998/0698womens/0698perls.html>. (Accessed.09/12/2015)
- Wendy, H., Monique, R., Margaret, L., (2007). Older Adults. In: Public Health Nutrition from principle to practice; Mark, L., Tony, W. (Eds). Open University Press McGraw-Hill Education, Berkshire England. Pp127-128
- WHO (World Health Organization) (1990). Diet, Nutrition and the Prevention of Chronic Diseases. Report of the joint WHO/FAO expert consultation. World Health Organization, Geneva. Pp1-2
- WHO (World Health Organization) (1995). The use and interpretation of anthropometry. WHO technical report series. World Health Organization, Geneva. 854: Pp375-409.
- WHO (World Health Organization) (2006). Global strategy on diet, physical activity and health. World Health Organization, Geneva. [Http://apps.who.int/gb/ebwha/pdf_files/WHA59-REC3/WHA59_REC3-en.pdf](http://apps.who.int/gb/ebwha/pdf_files/WHA59-REC3/WHA59_REC3-en.pdf). (Accessed09/7/2015)
- WHO (World Health Organization) (2008). Waist Circumference and Waist–Hip Ratio: Report of a World Health Organization Expert Consultation, Geneva. Pp8–11
- WHO (World Health Organization) (2012). Population of older persons. Report on a WHO population survey on older people’s population. World Health Organization, Geneva. Pp1
- WHO (World Health Organization) (2014). Nutrition for older persons. World Health Organization, Geneva. Pp1- 3
- WHO (World Health Organization) (2015). Global Health Observatory (GHO) data; Adult Mortality 1990-2013. World Health Organization, Geneva.

