

## NUTRITION KNOWLEDGE AND NUTRITION STATUS OF ELDERLY HYPERTENSIVE PATIENTS IN EHIME MBANO LOCAL GOVERNMENT AREA IMO STATE

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### ABSTRACT

**Background:** Knowledge of dietary modifications such as reduction in calorie, salt and alcohol intake as well as increase in the intake of fruits and vegetables is recommended in the prevention and control of hypertension.

**Objective:** This study aimed at evaluating the nutrition knowledge and nutritional status of the elderly hypertensive patients in Ehime Mbanjo Local Government Area (LGA) Imo state.

**Materials and methods:** This study was a cross-sectional survey comprising of two hundred hypertensive elderly patients. Four hospitals and three health centers in Ehime Mbanjo Local Government Area, Imo State were randomly selected and one in every fourth hypertensive patient that attended each selected study centre was recruited per day. A structured and validated questionnaire was used to collect information on socioeconomic data, food consumption pattern and nutrition knowledge. Heights, weight, blood pressure, waist and hip circumference measurements were determined using a stadiometer calibrated in centimeter, Harison weighing scale, manual sphygmomanometer and stethoscope and non stretchable steel tape respectively. Data was analysed using descriptive statistics, Pearson's Chi-square and Pearson's bivariate correlations.

**Results:** Fifty one percent (51%) of the subjects were females while 48% were males. Forty seven (47%) of the respondents had moderate knowledge of nutrition, 58% had stage one hypertension and 46% were overweight. Majority (74.0%) of the subjects eat three times a day. Eleven percent of the respondents consume at least one fruit daily while 40.0% consume at least one vegetable daily. There was significant association ( $p=0.002$ ) between good nutrition knowledge, body mass index and blood pressure.

**Conclusion:** The findings from this study show that good nutrition knowledge enhances healthy dietary practices and maintenance of good nutritional status and blood pressure among hypertensive elderly population.

**Key words:** *nutrition knowledge, high blood pressure, nutritional status, elderly*

### INTRODUCTION

Hypertension is a medical condition whereby an individual has elevated systolic and diastolic blood pressure (1). High blood pressure (HBP) is classified into two stages according to joint national committee on prevention, detection, evaluation and treatment of high blood pressure (2). These include: stage one HBP which ranges from systolic blood pressure of 140mmHg – 159mmHg and diastolic blood pressure of 90mmHg – 99 mmHg and stage two HBP which ranges from systolic blood pressure of 160mmHg and above and diastolic blood pressure of 100mmHg and above.

Hypertension is among the global public health problems of concern. Approximately 26% of all adults globally have hypertension (3) and its prevalence is estimated to increase to 29.2% by the year 2025 (4). In Nigeria, hypertension and its complications contribute to about 25% of emergency medical admissions in the hospitals (5). It is also the illness that is diagnosed most frequently in the elderly (6).

Several factors can predispose an individual to developing HBP. These include genetics, environment, aging, life style, metabolic stress, diet, and renal diseases (7). Studies have shown that excessive weight gain, high salt diet, low potassium diet, smoking of cigarettes and alcohol consumption are the major predisposing factors for hypertension (8). If blood pressure is not controlled, it may lead to heart attack, stroke, kidney damage, heart failure, arterial

fibrillation, coronary artery disease and poor eyesight (9).

To prevent and manage hypertension and its complications, the importance of dietary modifications such as reduction in energy, salt and alcohol intake as well as increase in the intake of fruits and vegetables cannot be overemphasized (10,11). It is therefore important for individuals to have good knowledge of nutrition in order to effectively manage their nutritional status and make healthy dietary choices in a bid to prevent and/or manage HBP (10).

High blood pressure is one of the most common non communicable diseases among the elderly. Ijarotimi and Keshinro (12) assessed the anthropometry, dietary intake and micronutrient status of hypertensive patients attending specialist hospitals in Ondo State, Nigeria. They reported that majority of the subjects were obese and lacked good nutrition knowledge. There is limited data on the knowledge of the modifiable risk factors of hypertension such as diet among the elderly hypertensive patients in Nigeria. Nutrition plays a significant role in managing the health status of the elderly hypertensive patients (13), and both under nutrition and over nutrition are associated with greater risk of morbidity and mortality (10). This research will therefore evaluate the nutrition knowledge, nutrition status and dietary pattern of hypertensive elderly patients in Ehime Mbanjo L.G.A Imo state.

## **MATERIALS AND METHODS**

### **SURVEY AREA**

This study was carried out at four hospitals and three health centers in Ehime Mbano Local Government Area Imo State. Ehime Mbano is one of the largest Local Government Areas in Imo State, Nigeria. It has an area of 169 square km and a population of 130,931 at the 2006 census, projected to be 204,340 people in 2015 (14). Rural or Urban?

### **SURVEY DESIGN**

A cross sectional study design was employed in this study.

#### **Population of study**

This study involved two hundred (200) hypertensive elderly patients that were randomly selected from the selected study centres

### **SAMPLE SELECTION**

Two hundred subjects were recruited from the selected study centres. A multistage sampling technique was employed in the selection of the subjects. The first stage comprised of the random selection of four hospitals out of eleven hospitals in Ehime Mbano and three health centres out of fifteen health centres in Ehime Mbano Local Government Area (14). The second stage involved simple random selection of one out of every fourth hypertensive patient that attended each selected study centre per day. Inclusion of an individual for the study was restricted to the hypertensive elderly people who attend the selected hospitals and health care centers for treatment in Ehime Mbano L.G.A Imo state. Subjects were recruited for a period of two month (from 4<sup>th</sup> September to 6<sup>th</sup> November 2017).

#### **Ethical Approval/Informed Consent**

Ethical clearance was obtained from Federal Medical Centre Owerri. Individuals who were to participate in the study signed the informed consent form before they were recruited.

#### **Data collection**

##### **Questionnaire**

A well-structured and validated questionnaire was used to elicit information on their personal data, clinical data, nutrition knowledge and the dietary pattern of the respondents. The questionnaire was interviewer administered to the elderly patients who were not able to write.

##### **Anthropometry**

The height, weight, waist circumference and hip circumference were measured using standard techniques (15). Height was measured to the nearest 0.1cm using a stadiometer. Body weight was measured using Harison weighing scale to nearest 0.1kilogram. Waist circumference and hip circumference were measured with a fabric tape. The respondents were assessed while standing erect on the scale, barefooted and with minimum clothing and accessories on.

The body mass index (BMI) was calculated by dividing

the weight in kilogramme by the square of the height in meters. The BMI of the subjects were compared to reference standard (14) as follows: 18.50kg/m<sup>2</sup>–24.99kg/m<sup>2</sup> have normal body weight, 25.00kg/m<sup>2</sup>–29.99kg/m<sup>2</sup> are overweight while those with BMI that is >30.00kg/m<sup>2</sup> are obese.

Waist-to hip ratio (WHR) was obtained by dividing waist circumference by hip circumference. Waist hip ratio greater than 0.85 for females and 0.90 for males indicates central (upper body) obesity and is considered high risk while WHR below these cut-off levels is considered low risk to chronic diseases such as diabetes and cardio metabolic diseases (16).

### **ASSESSMENT OF NUTRITION KNOWLEDGE**

Nutrition knowledge of the subjects was assessed on various aspects of nutrition and well-being like hygiene and sanitation, knowledge of food groups and balanced diet, dietary management of hypertension, under nutrition and over nutrition and their feeding pattern in order to ascertain their level of awareness about good nutritional practices. A total of fifteen multiple choice questions on nutrition knowledge were put together in the questionnaire.

Nutrition knowledge test was evaluated by awarding one score for each correct answer and zero for each wrong answer. The maximum attainable score was fifteen and the minimum was zero. The scores obtained were graded into three categories. Individuals with scores between zero to five were classified as having poor nutrition knowledge, those with scores between six to ten had moderate knowledge and those with scores between eleven to fifteen were classified as having good nutrition knowledge

### **ASSESSMENT OF DIETARY PATTERN**

A food frequency questionnaire and the 24-hour dietary recall method were used to assess food consumption patterns of the respondents. The food frequency questionnaire was used to assess the frequency of food consumption of various foods under six food groups. The frequency of food intake was categorized as daily, weekly, monthly, occasional intake. The 24-hour dietary recall was to further assess each patient's food consumption pattern. Each respondent was asked to recall all the foods and beverages consumed within the previous 24 hours. The recall included main meals, snacks, beverages as well as vitamin and mineral supplements consumed from rising up to going to bed.

#### **Blood pressure assessment**

The blood pressure measurement was taken using the manual mercurial sphygmomanometer (desk type, long cuff) and stethoscope. The blood pressure measurement of the subjects was taken while the subjects were in a seated position after the subject had rested for ten minutes using standard procedure. The higher number represents the systolic blood pressure while the lower number represents the diastolic pressure when a blood pressure reading is taken. The systolic blood pressure (SBP) and diastolic blood pressure (DBP) were recorded to the nearest 2mmHg. The values of SBP and DBP were compared to the

reference standard (2) as follows: pre-hypertension was diagnosed when SBP was 120–139 mmHg and DBP was 80–89 mmHg. Hypertension stage 1 was diagnosed when SBP was 140–159 mmHg and DBP was 90–99 mmHg, and hypertension stage 2 was diagnosed when SBP was 160 mmHg and DBP was 100 mmHg.

#### Statistical analysis

Data obtained was analyzed using Statistical Products for Service Solutions (SPSS) version 21.0. Results from the questionnaire were expressed in frequencies and percentages. The Pearson bivariate correlations was used to evaluate the relationship between nutrition knowledge, nutritional status, food frequency

consumption, socio economic status and blood pressure. The Pearson chi-square was used to evaluate the relationship between nutrition knowledge, nutritional status and blood pressure.

#### RESULTS

Table 1 shows the Socio-economic characteristic of the respondents. Fifty one percent of the subjects were females while 48.5% were males. Majority (52%) of the respondents were within the age range of 60-69, most of the respondents (99.0%) were Christians and majority of the respondents (97.0%) were Igbo's. Seventy five percent of the respondents were married and 44.0% were traders,

**Table 1: Socioeconomic characteristic of the respondents**

VARIABLES	MALE		FEMALE		TOTAL	
	Frequency	Percentage	Frequency	Percentage	Frequency	Percentage
<b>Age group (in years)</b>						
60 – 69	44	22.0	60	30.0	104	52.0
70 – 79	40	20.0	32	16.0	72	36.0
80 – 89	13	6.5	11	5.5	24	12.0
<b>Total</b>	<b>97</b>	<b>48.5</b>	<b>103</b>	<b>51.5</b>	<b>51.5</b>	<b>100</b>
<b>Marital Status</b>						
Single	2	1.0	4	2.0	6	3.0
Married	75	37.5	76	38.0	151	75.5
Widowed	20	10.0	23	11.5	43	21.5
<b>Total</b>	<b>97</b>	<b>48.5</b>	<b>103</b>	<b>51.5</b>	<b>51.5</b>	<b>100</b>
<b>Education</b>						
No formal education	25	12.5	31	15.5	56	28.0
Primary	17	8.5	11	5.5	28	14.0
Secondary	13	6.5	29	14.5	42	21.0
First degree	31	15.5	29	14.5	60	30.0
Post graduate degree	11	5.5	3	1.5	14	7.0
<b>Total</b>	<b>97</b>	<b>48.5</b>	<b>103</b>	<b>51.5</b>	<b>51.5</b>	<b>100</b>
<b>Religion</b>						
Islam	2	1.0	0	0.0	2	1.0
Christian	95	47.5	103	51.5	198	99.0
<b>Total</b>	<b>97</b>	<b>48.5</b>	<b>103</b>	<b>51.5</b>	<b>51.5</b>	<b>100</b>
<b>Ethnicity</b>						
Yoruba	1	0.5	2	1.0	3	1.5
Hausa	3	1.5	0	0.0	3	1.5
Igbo	93	46.5	101	50.5	194	97.0
<b>Total</b>	<b>97</b>	<b>48.5</b>	<b>103</b>	<b>51.5</b>	<b>51.5</b>	<b>100</b>
<b>Occupation</b>						
Civil servant	40	20.0	23	11.5	63	31.5
Trader	34	17.0	54	27.0	88	44.0
Public servant	8	4.0	6	3.0	14	7.0
Others	15	7.5	20	10.0	35	17.5
<b>Total</b>	<b>97</b>	<b>48.5</b>	<b>103</b>	<b>51.5</b>	<b>51.5</b>	<b>100</b>

Information on dietary practices of the subjects is presented in Table 2. More than half (74.0%) of the subjects eat three times daily, 72% skip meals of which 55.2% were females and 44.8% were males. Forty one percent of the subjects usually skip breakfast and 31% attributed their reason for skipping meals to finance. Majority 85.5% of the subjects engage in

snacking of which 54.4% were females and 45.6% were males. Few (10%) of the subjects take supplements, most (63.0%) of the subjects do not consume alcohol of which 61.9% were female and 38.1% were male.

**Table 2: Dietary habits of the Respondents**

VARIABLES	MALE		FEMALE		TOTAL	
	frequency	Percentage	Frequency	percentage	Frequency	Percentage
<b>Frequency of meal intake</b>						
Twice per day	20	10.0	20	10.0	40	20.0
Three times a day	68	34.0	80	40.0	148	74.0
Others	9	4.5	3	1.5	12	6.0
<b>Total</b>	<b>97</b>	<b>48.5</b>	<b>103</b>	<b>51.5</b>	<b>51.5</b>	<b>100</b>
<b>Skipping of meal</b>						
Yes	65	32.5	80	40.0	145	72.5
No	32	16.0	23	11.5	55	27.5
<b>Total</b>	<b>97</b>	<b>48.5</b>	<b>103</b>	<b>51.5</b>	<b>51.5</b>	<b>100</b>
<b>Meal skipped</b>						
Breakfast	41	20.5	42	21.0	83	41.5
Lunch	18	9.0	32	16.0	50	25.0
Dinner	6	3.0	5	2.5	11	5.5
Any meal	32	16.0	24	12.0	56	28.0
<b>Total</b>	<b>97</b>	<b>48.5</b>	<b>103</b>	<b>51.5</b>	<b>51.5</b>	<b>100</b>
<b>Reasons for skipping meal</b>						
Sickness	7	3.5	8	4.0	15	7.5
Lack of time	25	12.5	26	13.0	51	25.5
Weight management	7	3.5	8	4.0	15	7.5
Finance	24	12.0	38	19.0	62	31.0
Others	34	17.0	23	11.5	57	28.5
<b>Total</b>	<b>97</b>	<b>48.5</b>	<b>103</b>	<b>51.5</b>	<b>51.5</b>	<b>100</b>
<b>Snack intake</b>						
Yes	78	39.0	93	46.5	171	85.5
No	19	9.5	10	5.0	29	14.5
<b>Total</b>	<b>97</b>	<b>48.5</b>	<b>103</b>	<b>51.5</b>	<b>51.5</b>	<b>100</b>
<b>Alcohol consumption</b>						
Yes	49	24.5	25	12.5	74	37.0
No	48	24.0	78	39.0	126	63.0
<b>Total</b>	<b>97</b>	<b>48.5</b>	<b>103</b>	<b>51.5</b>	<b>51.5</b>	<b>100</b>
<b>Supplement intake</b>						
Yes	14	7.0	6	3.0	20	10.0
No	83	41.5	97	48.5	180	90.0
<b>Total</b>	<b>97</b>	<b>48.5</b>	<b>103</b>	<b>51.5</b>	<b>51.5</b>	<b>100</b>

Table 3 shows the 24 hours dietary recall of the subjects. For breakfast, twenty five percent of the respondents recalled tea and bread, 23.5% ate rice and sauce/rice and beans with sauce for lunch while 37.5% ate fufu with soup for dinner.

Table 3: 24 Hours dietary recall of the respondents

VARIABLES	MALE		FEMALE		TOTAL	
	Frequency	percentage	Frequency	Percentage	Frequency	Percentage
<b>Breakfast meal</b>						
Rice and bread/sandwich bread/bread and fried egg	23	11.5	27	13.5	50	25.0
Rice and sauce/rice, beans and sauce	15	7.5	18	9.0	33	16.5
Boiled yam/boiled plantain/cocoyam with sauce or edible oil	12	6.0	15	7.5	27	13.5
Spaghetti/noodles	2	1.0	7	3.5	9	4.5
Gari/akpu/wheat flour/semovita with soup (vegetable/okra/egusi soup)	18	9.0	17	8.5	35	17.5
Snacks (meat-pie/fish-pie/burger/sausage rolls)	15	7.5	9	4.5	24	12.0
Fried chips/fried yam/fried potato with or without fried egg	3	1.5	4	2.0	7	3.5
Roasted yam/roasted cocoyam with edible oil (palm oil/vegetable oil)	6	3	5	2.5	11	5.5
Yam porridge/plantain porridge/cocoyam porridge/ potato porridge	3	1.5	1	0.5	4	2.0
<b>Total</b>	<b>97</b>	<b>48.5</b>	<b>103</b>	<b>51.5</b>	<b>200</b>	<b>100</b>
<b>Lunch meal</b>						
rice and sauce/rice, beans and sauce	18	9.0	29	14.5	47	23.5
Boiled yam/boiled plantain/cocoyam with sauce or edible oil	13	6.5	16	8.0	29	14.5
Spaghetti/noodles	8	4.0	4	2.0	12	6.0
Gari/akpu/wheat flour/semovita with soup (vegetable/okra/egusi soup)	24	12.0	9	4.5	33	16.5
Snacks (meat-pie/fish-pie/burger/sausage rolls)	8	4.0	17	8.5	25	12.5
Fried chips/fried yam/fried potato with or without fried egg	3	1.5	8	4.0	11	5.5
Roasted yam/roasted cocoyam with edible oil (palm oil/vegetable oil)	2	1.0	3	1.5	5	2.5
Yam porridge/plantain porridge/cocoyam porridge/ potato porridge	21	10.5	17	8.5	38	19.0
<b>Total</b>	<b>97</b>	<b>48.5</b>	<b>103</b>	<b>51.5</b>	<b>200</b>	<b>100</b>
<b>Dinner meal</b>						
rice and sauce/rice, beans and sauce	18	9.0	14	7.0	32	16.0
Boiled yam/boiled plantain/cocoyam with sauce or edible oil	15	7.5	13	6.5	28	14.0
Spaghetti/noodles	5	2.5	9	4.5	14	7.0
Gari/akpu/wheat flour/semovita with soup (vegetable/okra/egusi soup)	35	17.5	40	20.0	75	37.5
Snacks (meat-pie/fish-pie/burger/sausage rolls)	3	1.5	5	2.5	8	4.0
Fried chips/fried yam/fried potato with or without fried egg	1	0.5	0	0	1	0.5
Roasted yam/roasted cocoyam with edible oil (palm oil/vegetable oil)	2	1.0	4	2.0	6	3.0
Yam porridge/plantain porridge/cocoyam porridge/ potato porridge	18	9.0	18	9.0	36	18.0
<b>Total</b>	<b>97</b>	<b>48.5</b>	<b>103</b>	<b>51.5</b>	<b>200</b>	<b>100</b>

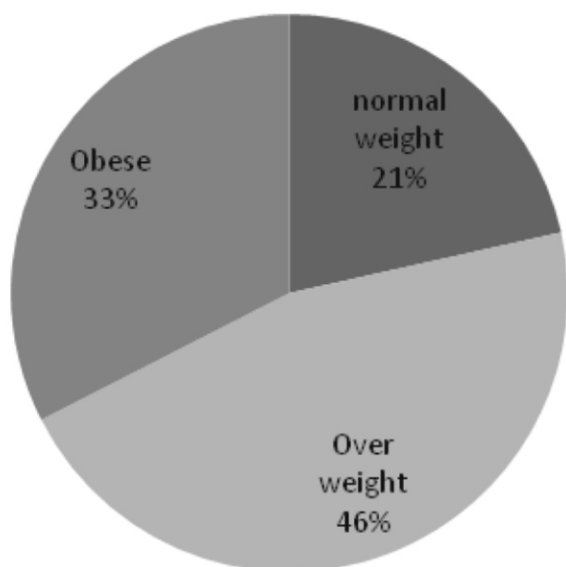
Table 4 shows the frequency of food consumption of the respondents. Almost half of the respondents (47.5%) consume root and tubers daily, majority (69.5%) consume legumes weekly and 57.5% consume cereals weekly. Approximately half (51.0%) of the subjects consume fruits weekly, 55.0% consume vegetables weekly and majority (53.5%) consume milk daily. Most (61.5%) of the subject consume fish weekly, 57.5% consume meat weekly and majority (54.0%) consume fat and oils weekly.

**Table 4: Food frequency consumption pattern of the respondent**

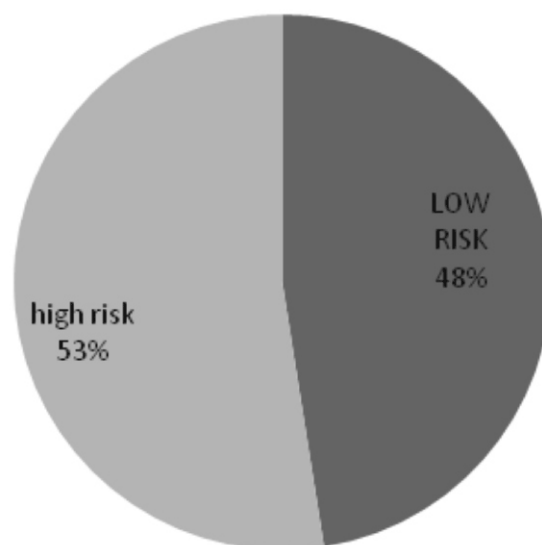
<b>VARIABLES</b>	<b>Frequency</b>	<b>Percentage</b>
<b>Root/tuber intake</b>		
Daily	95	47.5
Weekly	93	46.5
Monthly	12	6.0
<b>Total</b>	<b>200</b>	<b>100</b>
<b>Legume intake</b>		
Daily	32	16.0
Weekly	139	69.5
Monthly	29	14.5
<b>Total</b>	<b>200</b>	<b>100</b>
<b>Cereal intake</b>		
Daily	67	33.5
Weekly	115	57.5
Monthly	18	9.0
<b>Total</b>	<b>200</b>	<b>100</b>
<b>Fruit intake</b>		
Daily	22	11.0
Weekly	102	51.0
Monthly	76	38.0
<b>Total</b>	<b>200</b>	<b>100</b>
<b>Vegetable intake</b>		
Daily	80	40.0
Weekly	110	55.0
Monthly	10	5.0
<b>Total</b>	<b>200</b>	<b>100</b>
<b>Milk intake</b>		
Daily	22	11.0
Weekly	107	53.5
Monthly	71	35.5
<b>Total</b>	<b>200</b>	<b>100</b>
<b>Fish intake</b>		
Daily	52	26.0
Weekly	123	61.5
Monthly	25	12.5
<b>Total</b>	<b>200</b>	<b>100</b>
<b>Meat intake</b>		
Daily	45	22.5
Weekly	115	57.5
Monthly	40	20.0
<b>Total</b>	<b>200</b>	<b>100</b>
<b>Fat intake</b>		
Daily	65	32.5
Weekly	108	54.0
Monthly	27	13.5
<b>Total</b>	<b>200</b>	<b>100</b>

Figure 1, 2, 3 and 4 show the body mass index, waist hip ratio, blood pressure and nutrition knowledge of the subjects respectively. Forty six percent of the subjects were overweight, 32.5% were obese while 21.5% had normal weight. Fifty two percent of the subject had high risk waist hip ratio, more than half (58.5%) had stage one hypertension and 47% had moderate nutrition knowledge.

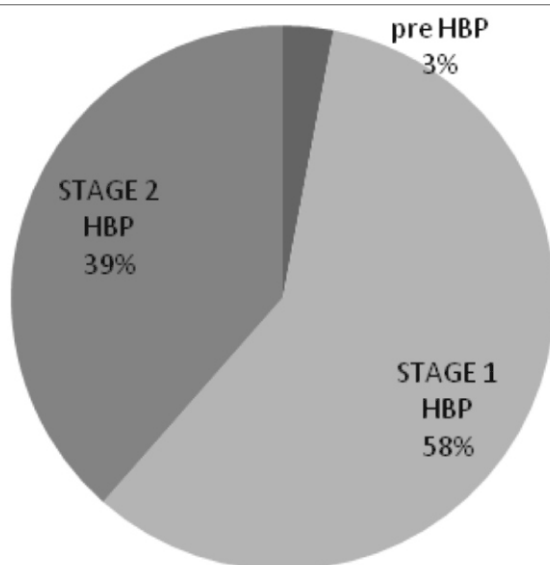




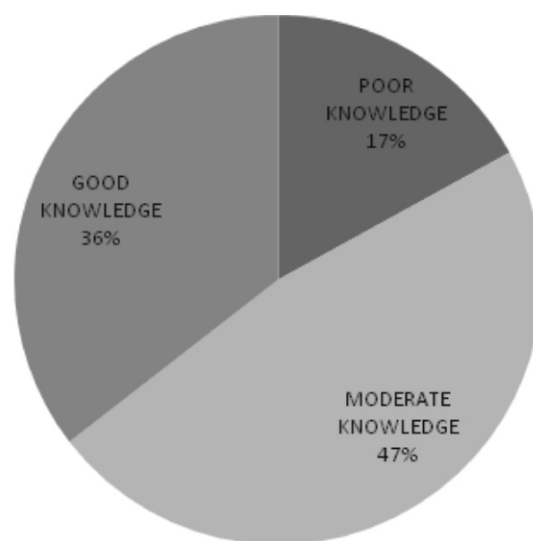
**Fig 4.1: BMI classification of the respondents**



**Fig 2: WHR classification of the respondents**



**Fig 3: Blood pressure classification of the respondents**



**Fig 4: Nutrition knowledge of the respondents**

Tables 5 shows the relationship between nutrition knowledge, blood pressure, selected socioeconomic characteristics and dietary pattern of the respondents. It was observed that there was significant ( $p < 0.05$ ) positive correlations between blood pressure and marital status ( $r = 0.159$ ;  $p = 0.024$ ) and blood pressure and waist hip ratio ( $r = 0.144$ ) while an insignificant ( $p > 0.05$ ) positive correlation was observed between blood pressure and nutrition knowledge ( $r = 0.011$ ). In addition there was significant ( $p < 0.01$ ) positive correlation between nutrition knowledge and highest education attained ( $r = 0.625$ ) while nutrition knowledge had significant ( $p < 0.01$ ) negative correlation with respondents age ( $r = -0.291$ ) and marital status ( $r = -0.215$ ).

**Table 5: Relationship between nutrition knowledge, Blood pressure, selected social economic characteristics and dietary pattern**

	Marital status	Highest education attained	Frequency of meal intake	Skipping of meal	Respondents age	Blood pressure	Nutrition knowledge
Marital status	1						
Highest education attained		1					
Frequency of meal intake	-.107	.105	1				
Skipping of meal	.020		.290 <sup>b</sup>	1			
Respondents age		-.503 <sup>b</sup>	.041	.081	1		
Blood pressure	.327 <sup>b</sup>	.159 <sup>a</sup>	.017	-.058	.010	-.048	1
Nutrition knowledge	-.215 <sup>b</sup>	.625 <sup>b</sup>	.046	.125	-.291 <sup>b</sup>	.011	1

<sup>b</sup>. Correlation is significant at the 0.01 level (2-tailed). <sup>a</sup>.correlation is significant at the 0.05 level (2-tailed)

Table 6 shows the relationship between blood pressure, nutrition knowledge and body mass index of the subjects. There was a significant association ( $p < 0.01$ ) between good nutrition knowledge, body mass index and blood pressure.

**Table 6: Relationship between blood pressure, nutrition knowledge and body mass index**

NUTRITION KNOWLEDGE			PRE HYPERTENSION	STAGE 1 HBP	STAGE 2 HBP	TOTAL	CHI-SQUARE
POOR	BMI	Normal weight	1	5	4	10	....
		Over weight	0	9	7	16	df=4
		Obese	0	4	4	8	p=0.633
		<b>Total</b>	<b>1</b>	<b>18</b>	<b>15</b>	<b>34</b>	
MODERATE	BMI	Normal weight	1	13	6	20	X <sup>2</sup> =3.891
		Over weight	2	28	11	41	df= 4
		Obese	0	19	15	34	p=0.421
		<b>Total</b>	<b>3</b>	<b>60</b>	<b>32</b>	<b>95</b>	
GOOD	BMI	Normal weight	1	12	0	13	X <sup>2</sup> =17.19
		Over weight	1	20	14	35	df=4
		Obese	0	7	16	23	p=0.002
		<b>Total</b>	<b>2</b>	<b>39</b>	<b>30</b>	<b>71</b>	
TOTAL	BMI	Normal weight	3	30	10	43	
		Over weight	3	57	32	92	
		Obese	0	30	35	65	
		<b>Total</b>	<b>6</b>	<b>117</b>	<b>77</b>	<b>200</b>	

p value <0.05 is considered significant



## DISCUSSION

This study investigated the nutrition knowledge and nutrition status of hypertensive elderly patients in Ehime Mbano Local Government Area (LGA) Imo state. More than half (51.5%) of the subjects were females. This trend could be associated with females having better health seeking habits than men (17). Previous studies have reported similar trends (12,18,19,). Majority (52%) of the subjects were within the age range of 60 – 69 years. This could be linked to the increased risk of morbidity and mortality associated with the complications of high blood pressure (1). Most (97.0%) of the subjects were Igbo and Christians (99.0%) which could be probably related to the geographical location in which the research was carried out as the major ethnic group in the south-east geopolitical zone of Nigeria is Igbo while the major religion practiced is Christianity. Majority (75.5%) of the subjects were still married. Thirty percent of the subjects had first degree however trading was the main occupation of the subjects. This could be attributed to the fact that this study was carried out in the rural area or as most of them have retired from public service.

Majority of the patients (72.5%) skip at least one meal daily. This may be related to the traditional African culture where only two main meals are majorly consumed per day (120). It could also be attributed to the poor financial status of the patients or due to poor weight management practices (5). Studies have shown that, skipping of meals, especially breakfast, could lead to excessive consumption of food in the next meal (21). This poor dietary habit in addition to their sedentary lifestyle, as most of them have retired from public service and now stay with their family might increase their chance of weight gain and development of complication of HBP.

Majority of the subjects were either overweight or obese. The high body mass index observed in majority of the subjects in this study is related to the reports of (12, 18,19). All the subjects investigated in this study were up to sixty years and most were retirees which could be associated with their sedentary lifestyle that could have contributed to their weight gain. In addition, the diet of the subjects consists majorly of cereals, root and tubers while few of the subjects consume fruits and vegetables daily. Overweight and obesity are conditions usually associated with poor life style attributes such as excessive calorie consumption, living a sedentary life style and low consumption of fruits and vegetables (3, 22). The development of high blood pressure among individuals has been reported to be related to living a sedentary life style and excessive weight gain (23,24). Aneja *et al*(25) reported that *weight loss is one of the most effective measures that can be taken to manage high blood pressure among overweight and obese individual. However, the poor dietary practices and sedentary lifestyle of the subjects may limit the control of blood pressure*

Majority of the subjects (64%) did not have good nutrition knowledge. This could be attributed to the educational attainment of the hypertensive patients as most (63%) of the subjects had secondary school education or below. The finding from this study is

related to the report of (12,24). Evidence shows that good nutrition knowledge is important in the prevention and management of high blood pressure. Good nutrition knowledge plays a role in the modification of lifestyle factors associated with hypertension. These include smoking, salt intake, obesity, physical activity and alcohol consumption (18, 22).

Significant relationship ( $\chi^2= 17.190$ ,  $p= 0.002$ ) was observed between good nutrition knowledge, body mass index and blood pressure. This is consistent with the evidence that nutrition knowledge could improve nutritional status(22) while weight reduction improves blood pressure of an individual (25). This is related to the report of (24) who reported that nutrition knowledge was associated with the modification of lifestyle factors which increase the risk and complications of hypertension.

## CONCLUSION

The findings from this study show that good nutrition knowledge enhances good dietary practices and maintenance of good nutritional status and blood pressure among hypertensive elderly population. This study reveals the need to improve the nutritional knowledge of the elderly hypertensive patients in Ehime Mbano LGA which will play a role in the modification of lifestyle factors associated with increased risk and complications of high blood pressure. Future studies could examine the effect of nutrition intervention programs such as nutrition education and counseling on the lifestyle of the elderly hypertensive patients in Ehime Mbano LGA.

## REFERENCES

1. Okpara, E., (2003). Assessment of health of senior executives in a developing country. *Public Health* 114, 273–275.
2. Joint National Committee (JNC, 2004). The Seventh Report of the Joint National Committee on prevention, detection, evaluation, and treatment of high blood pressure. *Journal of American Medical Association* 289, 2560–2572.
3. Keys, A (2008). Coronary heart disease: overweight and obesity as risk factors, *Annals of internal medicine* 17:15-27
4. World Health Organization (WHO, 2002). World Health Organization report: *Reducing risks, promoting healthy life*.
5. Ekere, A.U., Yellowe, B.E. and Umune, S. (2005). Mortality patterns in the accident and emergency department of an urban hospital in Nigeria. *Nigerian Journal of Clinical Practice* 8, 14–18

6. Okojie, O.H., Isah, E.C. & Okoro, E. (2000). Assessment of health of senior executives in a developing country. *Public Health* 114, 273–275
7. Tierney L.M., McPhee S.T., and Papadakis M.A. (2003). Current medical diagnosis and treatment: pg. 448-466, 40<sup>th</sup> edition. Lange medical books/mc Graw-hill Medical publishing division, New York.
8. Kotchen, T.A., Kotchen, J.M., and Boegehold, M.A. (2001). Nutrition and hypertension prevention. *Hypertension* 18, (Suppl 3), 115-120.
9. World Health Organization (2013). Obesity; preventing and managing the global epidemic. WHO Technical Report Series 894
10. Dickey, R.K. and Jnick J.J.(2001). Lifestyle modifications in the prevention and treatment of hypertension. *Endocr Pract* 5(5):392-399
11. Haqberg, J.M., Parrk, J.J. and Brown, M.D. (2000). The role of exercise training in the treatment of hypertension: an update. *Sports Med.* 30(3): 193-206.
12. Ijarotimi, O.S. and Keshinron, O.O. (2008). Nutritional knowledge, nutrients intake and nutritional status of hypertensive patients in Ondo State, Nigeria. *Tanzania Journal of Health Research* 10 (2):59-67
13. World Health Organisation. (WHO, 2009). Nutrition for older persons. Retrieved from <http://www.who.int/nutrition/topics/ageing/en/index.html>
14. Ehime Mbanjo World Congress (EMWC, 2016). Description of Ehime Mbanjo Local Government Area. Retrieved from <http://www.ehimembanoworldcongress.org/business-services-about-us>
15. World Health Organization (WHO, 1995). *Physical Status: The Use and Interpretation of Anthropometry*. Report of a WHO Expert Committee. WHO Technical Report Series. 854, 1-452
16. World Health Organization (WHO, 2008). Waist Circumference and Waist–Hip Ratio: Report of a WHO Expert Consultation.
17. McCarthy, H. D., Ashwell, M. (2006). A study of central fatness using waist-to-height ratios in UK children and adolescents over two decades supports the simple message-'keep your waist circumference to less than half your height.' *International Journal of Obesity*. (30): 988-992.
18. Chotisiri, L., Yamarat, K. and Taneapanichskul, S. (2016). Exploring knowledge, attitudes, and practices toward older adults with hypertension in primary care. *Journal of Multidisciplinary Healthcare* 9 559–564
19. Anowie, F. and Darkwa, S. (2015). The knowledge, attitudes and lifestyle practices of hypertensive patients in the Cape Coast Metropolis-Ghana. *Journal of Scientific Research & Reports* 8(7): 1-15
20. Ameh, O.I., Cilliers, L. and Okpechi, I.G (2016). A practical approach to the nutritional management of chronic kidney disease patients in Cape Town, South Africa. *BMC Nephrol.* 17(1)1: 68.
21. Ball, K., Crawford, D., Mishra, G., (2006). Socio-economic inequalities in women's fruit and vegetable intakes: a multilevel study of individual social and environmental mediators. *Public Health Nutr.* 9, 623–630.
22. Becker, H., Bester, M., Reyneke, N., Labadarios, D., Monyeki, K.D. and Steyn, N.P. (2004). Nutrition related knowledge and practices of hypertensive adults attending hypertensive clinics at day hospitals in the Cape Metropole. *Curationis* 63-69
23. Lelong, H., Galan, P., Kesse-Guyot, E., Fezeu, L., Hercberg, S. and Blacher, J. (2015). Relationship Between Nutrition and Blood Pressure: A Cross-Sectional Analysis from the NutriNet-Santé Study, a French Web-based Cohort Study. *American Journal of Hypertension* 28, (3); 362–371
24. Khaleshi, S., Sharma, S., Irwin, C. and Sun, J. (2016). Dietary patterns nutrition knowledge and lifestyle: associations with blood pressure in a sample of Australian adults (the food BP study). *Journal of Human Hypertension* 30, 581–590
25. Aneja, A., El-Atat, F., McFarlane, S.I. and Sowers, J.R. (2004). Hypertension and obesity. *Recent Progress in Hormone Research* 59, 169-205