



## ASSESSMENT OF NUTRITIONAL STATUS AND DIETARY PATTERN OF RURAL AND URBAN RETIREES IN SELECTED COMMUNITIES OF SOUTH-WEST NIGERIA

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**Abstract:** The study assessed nutritional status and dietary pattern of rural and urban retirees in selected communities in South-West Nigeria. Four research questions were raised to guide the study and two hypotheses were formulated and tested at 0.05 level of significance. The study adopted a descriptive survey design with a 420 respondents. Three instruments were used for the study which is laboratory analysis, structured questionnaire and measurement of anthropometric indices. The instrument was validated by experts while its reliability test was done using Pearson Product-Moment Correlation which yielded a co-efficient of 0.83. Frequency, Percentage, Mean and Standard Deviation were used to answer research questions while Pearson Correlation Coefficient was used to test the hypothesis. The results of the study showed that level of food intake was high but low in quality, more than half of the retirees are at a high nutritional health risk, the nutritional status was normal for male retirees and risky for female. Furthermore, the relationship between food intake and nutritional status is insignificant for rural retirees but, low, negative and significant for rural and urban retirees in selected community in South-West Nigeria. The study recommended, among others, that proper attention should be given to retirees' food intake to reduce the observed prevalence of nutrient deficit in order to improve their quality of life.

[Obisesan, D. O, Alaka, F. A, Odunayo, A. A. & Aanu-Bakare, G. O. **ASSESSMENT OF NUTRITIONAL STATUS AND DIETARY PATTERN OF RURAL AND URBAN RETIREES IN SELECTED COMMUNITIES OF SOUTH-WEST NIGERIA.** *Nat Sci* 2024,22(7):32-39].ISSN1545-0740(print);ISSN2375-7167(online).<http://www.sciencepub.net/nature> 05. doi:[10.7537/marsnsj220724.05](https://doi.org/10.7537/marsnsj220724.05).

**Keywords:** Anthropometric indices, food intake, nutritional status, quality of life, retirees.

### 1.0 Introduction

There are different opinions on when 'old age' begins which depends on the selection criteria, the starting point for old age in Nigeria and international circle has been set at 60 years. A retiree is often an elderly person advanced in age beyond middle age; old age consists of ages nearing or surpassing the average life span of human being and thus heading towards the end of human life cycle. They are those who have retired from the public sector or any paid position and are 60 years of age or older, they are also known as retirees or senior citizen (Babineau et al., 2018). Research have shown that nutrition in one early age goes a long way to affect one's nutritional status and health-wise in the old age. Nutritional requirements in the elderly remain about the same, but their energy needs decrease. This means that older people should consciously select foods with a high nutritional value (Shahar, 2017). These are foods that are high in vitamins, minerals and fibre like whole grain products, legumes, fruit and vegetables. Rich energy source foods such as oils, butter, cold cuts,

whole-milk products, baked goods and candy should be eaten sparingly because they contain a lot of calories in the form of sugar and fat which can contribute to obesity just as in younger years, attention must be given in old age to maintain a healthy body weight. Energy consumption is also raised by regular exercise, and this has a beneficial effect on weight. People who exercise regular can also eat more, and this makes it easier to meet daily vitamin, mineral, and trace requirements (Dunne & Dahl, 2017).

Physical activity has the benefit of preventing muscle deterioration, promoting mental equilibrium, and warding off the disease of civilization in elderly person/retirees (King et al., 2017). Everyday physical exercise can be added to, or substituted for, sports like bicycling, gym work-outs, strength training, or walking. Use the stairs instead of the elevator or escalator, go shopping on foot, take an afternoon walk through the path or by the lake, take a walk with the dog (or your neighbor's) and the likes. Outdoor exercise builds up vitamin D from the sunshine which, along with calcium,

influences bone density. Hunger and thirst as well as the senses of taste and smell can decrease in older people. It may be helpful to have outside reference points and signals for guidance (time of day, members of the household and the likes). Eating and drinking should therefore be planned. It is useful to develop an eating pattern in which several small meals are spread out over the day. The sensation of thirst can also diminish; the body's signals for lack of fluids get weaker with age (Firdaus, 2015). The old people should drink at least 105 litres (3pints) of liquid a day, the volume of liquid drinks should be increased in case of greater fluid loss (e.g. heavy sweating, vomiting, diarrhea, etc.) coffee, black tea and alcoholic drinks do not count since they draw fluid from the body. These problems can be dealt with by balanced nutrition, eating fibre-rich foods such as whole-grain products (at least one portion a day) and fruits and vegetables and by drinking at least 105 litres (3pints) of liquids.

Proper chewing promotes digestion (Babar et al., 2022). The digestive tract is less burdened if several small meals a day are consumed, while digestive disorder such as bloating and feelings of fullness will occur less often. Exercise and abdominal massage could keep the intestines moving (Fanelli & Stevenhagen, 2018). The best formula for a healthy old age is an active lifestyle with regular bodily exercise, an abundance of social interaction and a balanced varied (Higuera, 2019). Thus, in a nation like Nigeria where the economy is in a decline, diet-related illnesses are unavoidable, it became obvious that elderly people's eating habits and nutritional status must be determined in order to implementing interventions because the effects on the health of retirees in rural and urban regions may be severe. Therefore, the objective of the research was to use senior citizens in South-West Nigeria's rural and urban residents to assess food intake and nutritional status while four research questions were raised to guide the study and one hypothesis was tested at 0.05 level of significant.

### 1.1 Research Questions

The following research questions were used to guide the study;

- i. What is the health status of rural and urban retirees in selected communities of South-West Nigeria?
- ii. What is the nutritional status of rural and urban retirees in selected communities of South-West Nigeria?
- iii. Is there any difference between the food intake, health and nutritional status of male and female among the rural and urban retirees in selected communities of South-West Nigeria;
- iv. Is there any correlation between food intake, health and nutritional status of rural and urban

retirees in selected communities of South-West Nigeria?

### 1.2 Objectives of the study

The general purpose of the study is to assess the nutritional status and dietary pattern of rural and urban retirees in selected communities of south-west Nigeria while its specific objectives are;

- i. Determine the health status of rural and urban retirees in selected communities of South-West Nigeria;
- ii. Investigate the nutritional status of rural and urban retirees in selected communities of South-West Nigeria;
- iii. Examine the difference between the food intake, health and nutritional status of male and female among the rural and urban retirees in selected communities of South-West Nigeria;
- iv. Find out if there is any correlation among food intake, health and nutritional status of the rural and urban retirees in selected communities of South-West Nigeria.

### 1.3 Hypotheses

- i.  $H_0: \beta = \theta$  There is no significant difference between the food intake of rural and urban retirees in selected communities of South-West Nigeria.
- ii.  $H_0: \beta = \theta$  There is no significant different between the food intake, health and nutritional status of male and female among the rural and urban retirees in selected communities of South-West Nigeria

### 2.0 Research design

The research design used was descriptive research design which was mainly used to elicit information on the assessment of nutritional status and dietary pattern of rural and urban retirees in selected communities in South-West of about 2,385,053 elderly/retirees in South-West Nigeria (National Bureau of Statistics, NBS, 2023).

### 2.1 Population and sampling techniques

Multi-stage sampling techniques were employed for the study. The first stage was the selection of four (i.e 0.02%) of the retirees in each states in the geo-political zone. The four states were purposively selected for manageability. The selected states are (Ekiti, Lagos, Ogun and Osun). This was followed by random selection of (0.02%) in each of the four states whereby each state was divided into rural local governments and also urban local governments while each selected local government, there were randomly selection of towns and villages as well as communities and wards. In each ward,

purposive election of retirees was taking place for about (0.02%) which amount the total of four hundred (420) retirees used for the study.

## 2.2 Instrument for data collection

A structured questionnaire was used for data collection which consists of two sections (A and B). Section A elicit information on the samples consisting of 5 (demographical profile) terms with 18-items. Section B was a pre-format recorded of 24-hour dietary recall and nutritional intake of the elderly based on their age, height, and weight was taken using a bathroom scale and height meter. These measurements were used to determine stunting, underweight and wasting of the respondents which were done during observation for weeks before their daily intake (24hr- recall method) for laboratory analysis in order to determine their daily food intake when compared to food composition standard/textbook.

## 2.3 Validation and reliability of the instrument

The ascertain of content and face validity of the instrument was done by giving out the questionnaire to experts in the field of nutritionists who are also experienced in research which help to eliminate all forms of bias and irrelevant items from the questionnaire. The suggested areas of modification were affected by the researchers. The reliability of the instrument was established by using the test-retest method. Forty respondents of twenty females and twenty males per each state was randomly selected from four different rural and urban areas in Ondo and Oyo States that are not parts of the states used for the study. A re-administration of the same instrument was done after two weeks using the same group of respondents. The total scores for each testing period were computed and Pearson Product Moment Correlation (PPMC) was used to determine the agreement between the two scores. A reliability test "r" 0.78 was accepted to make the structured questionnaire highly reliable.

## 2.4 Data collection and analysis

The administration, collection of the questionnaire and body measurement of was done with the help of two research assistants. Four hundred and twenty copies of the questionnaire were randomly distributed to the respondents and all were recovered back. Data generated through the questionnaire was

analyses using percentages, mean and standard deviation. The food intake of the rural and urban retirees was compared with Food and Agriculture Organization standards. The hypothesis was tested at 0.05 level of significant while laboratory results were expressed as mean of triplicate analyses.

## 3.0 Results and discussion

### 3.1 Proximate Composition of 24-hr recall food intake of the retirees

There was no significant differences ( $p < 0.05$ ) in moisture content ( $8.04 \pm 0.21 - 8.64 \pm 0.22$ ) and total ash ( $3.41 \pm 0.00 - 3.92 \pm 0.14$ ) of the nutrient intake of both rural and urban area retirees in South-West Nigeria. The crude protein ( $5.56 \pm 0.01 - 6.87 \pm 0.21$ ), crude fat ( $5.09 \pm 0.07 - 6.04 \pm 0.16$ ), crude fibre ( $1.69 \pm 0.23 - 2.74 \pm 0.09$ ) and carbohydrate ( $72.46 \pm 0.16 - 74.96 \pm 0.39$ ) shows significant differences in food intake of both rural and urban area retirees in south-west Nigeria. The energy (kJ/g) value of urban retirees has highest ( $391.54 \pm 1.01$ ) value compared to rural retirees of  $384.91 \pm 0.96$ , respectively. The finding in response to the first research question depicted that the level of food intake of retirees in South-West Nigeria is high but low in quality. This could be that majority of them lack nutritional knowledge/education that can be of helps to maintain adequate balanced diet which promotes health living. This finding is supported by the submission of Micronutrient Information Center (2021) which explained that it is known among older adults that one can always use a little extra energy throughout the day; they must all be in balance for the body to function properly. The world of foods and nutrition has changed a lot over the years while back then it used to be whole milk, red meat and eggs, but now nutritionist are encouraging leafy green vegetables, fruits, and whole grains to maintain adequate nutritional status. In addition, United States Department of Agriculture (2021) reported that many people have some common knowledge on what is good and what is bad for the human body to consume. Fruits, vegetables, nuts and grains are some common items people consider healthy foods, it is not enough just to know what type of foods are good for the body, it is also important to understand nutritional knowledge of food nutrients and how it function in the body and promote good health status.

Tables 1: Proximate Composition of 24-hr recall food intake of the retirees

Parameter (%)	Lagos State		Ogun State		Ekiti State		Osun State	
	Oluwole (Urban)	Isele (Rural)	Lafenwa (Urban)	Ilugun (Rural)	Ado-Ekiti (Urban)	Ayegbaju (Rural)	Akarabata (Urban)	Gbogan (Rural)
Moisture content	8.53 ± 0.23 <sup>b</sup>	8.54 ± 0.11 <sup>b</sup>	8.19 ± 0.30 <sup>a</sup>	8.04 ± 0.21 <sup>a</sup>	8.64 ± 0.13 <sup>b</sup>	8.64 ± 0.22 <sup>b</sup>	8.33 ± 0.15 <sup>ab</sup>	8.28 ± 0.23 <sup>a</sup>
Crude protein	6.87 ± 0.21 <sup>c</sup>	6.75 ± 0.17 <sup>c</sup>	5.56 ± 0.01 <sup>a</sup>	6.25 ± 0.26 <sup>b</sup>	6.21 ± 0.20 <sup>b</sup>	6.43 ± 0.11 <sup>bc</sup>	6.57 ± 0.08 <sup>bc</sup>	6.08 ± 0.21 <sup>b</sup>
Crude fat	5.57 ± 0.03 <sup>b</sup>	5.28 ± 0.20 <sup>a</sup>	5.59 ± 0.11 <sup>b</sup>	5.09 ± 0.07 <sup>a</sup>	6.04 ± 0.16 <sup>c</sup>	5.77 ± 0.03 <sup>bc</sup>	5.31 ± 0.01 <sup>a</sup>	5.42 ± 0.14 <sup>a</sup>
Crude fiber	2.34 ± 0.08 <sup>bc</sup>	2.46 ± 0.11 <sup>c</sup>	2.25 ± 0.05 <sup>bc</sup>	2.08 ± 0.13 <sup>b</sup>	2.74 ± 0.09 <sup>d</sup>	2.04 ± 0.06 <sup>b</sup>	2.19 ± 0.11 <sup>ab</sup>	1.69 ± 0.23 <sup>a</sup>
Total ash	3.80 ± 0.00 <sup>ab</sup>	3.92 ± 0.14 <sup>b</sup>	3.46 ± 0.07 <sup>a</sup>	3.41 ± 0.00 <sup>a</sup>	3.91 ± 0.04 <sup>b</sup>	3.86 ± 0.01 <sup>ab</sup>	3.81 ± 0.03 <sup>ab</sup>	3.57 ± 0.05 <sup>a</sup>
CHO	72.94 ± 0.05 <sup>a</sup>	73.03 ± 0.43 <sup>ab</sup>	74.15 ± 0.27 <sup>c</sup>	75.13 ± 0.52 <sup>cd</sup>	72.46 ± 0.16 <sup>a</sup>	73.26 ± 0.29 <sup>ab</sup>	73.79 ± 0.41 <sup>ab</sup>	74.96 ± 0.39 <sup>cd</sup>
Energy, KJ/g	387.48 ± 1.05 <sup>b</sup>	384.91 ± 0.96 <sup>a</sup>	390.75 ± 0.93 <sup>c</sup>	389.75 ± 1.00 <sup>bc</sup>	387.67 ± 0.91 <sup>b</sup>	389.30 ± 0.88 <sup>bc</sup>	387.62 ± 0.87 <sup>b</sup>	391.54 ± 1.01 <sup>c</sup>

Values are means ± SD of triplicate determinations while values with different superscript within the same row are significantly different @  $p < 0.05$ . SD: significant different; CHO: carbohydrate; n: Total number of respondents.

### 3.2 Mineral profiles of 24-hr recall food intake of the retirees

Statistical differences were observed at alpha  $p < 0.05$  in all the mineral profiles determined between the rural and urban area retirees. The value of calcium content ( $1.84 \pm 0.03$  -  $2.48 \pm 0.11$ ), copper ( $1.96 \pm 0.11$  -  $2.61 \pm 0.21$ ), iron ( $1.99 \pm 0.00$  -  $2.64 \pm 0.04$ ), magnesium ( $18.37 \pm 0.00$  -  $26.87 \pm 1.04$ ), potassium ( $161.18 \pm 0.47$  -  $191.52 \pm 1.63$ ), sodium ( $10.32 \pm 0.21$  -  $13.18 \pm 0.84$ ) and zinc ( $1.95 \pm 0.13$  -  $2.67 \pm 0.81$ ) shows significant differences in food intake of both rural and urban area retirees in south-west Nigeria. The highest mean value of  $34.25 \pm 0.47$  was obtained in Oluwole, an urban area while the lowest mean value was  $28.47 \pm 0.91$  (Gbogan, a rural area), respectively. The findings in response to the research question that showed the health status of retirees in South-West Nigeria are having a high health risk. This could be because of inadequate nutrient intake which deprived them of the ability to meet their nutritional requirement. In a similar allusion, World Health Organization (2022) posited that healthiest seniors are those who take measures to maintain various aspects of their health as they get older.

According to Wyka et al. (2019), various factors like physical, social, physiological contribute to reduced food intake among older adult's population, resulting in the nutrient deficiencies which indirectly contribute to their poor health status. In answer to the research question that shows nutritional status of retirees in South-West Nigeria, is averagely normal for male retirees and averagely high risk for female retirees. This may be because female retirees are prone to diseases of different kinds than their male counterparts. This agrees with the submission of Geirsdóttir and Bell (2021) that older adults are at higher risk for malnutrition, which refers to deficiencies, excesses or imbalances in intake of energy and nutrients, malnutrition detrimentally impacts health, cognitive and physical functioning and quality of life. The submission of Capicio (2022) is inline that about two-thirds of Canadian adults are at high nutrition risk, predisposing them to frailty, hospitalization and death later in life. Nutrition risk occurs in up to 70 % of Canadian community-dwelling older adults and is associated with hospitalization, reduced health-related quality of life, and mortality.

Tables 2: Mineral Profiles of 24-hr recall food intake of the retirees

Parameter (100mg/g)	Lagos State		Ogun State		Ekiti State		Osun State	
	Oluwole (Urban)	Isele (Rural)	Lafenwa (Urban)	Ilugun (Rural)	Ado-Ekiti (Urban)	Ayegbaju (Rural)	Akarabata (Urban)	Gbogan (Rural)
Calcium	1.86 ± 0.00 <sup>a</sup>	2.48 ± 0.11 <sup>bc</sup>	1.79 ± 0.07 <sup>a</sup>	1.84 ± 0.03 <sup>a</sup>	2.31 ± 0.00 <sup>b</sup>	2.33 ± 0.06 <sup>b</sup>	2.08 ± 0.13 <sup>ab</sup>	2.01 ± 0.10 <sup>ab</sup>
Copper	2.46 ± 0.00 <sup>b</sup>	2.61 ± 0.21 <sup>c</sup>	1.96 ± 0.18 <sup>a</sup>	1.96 ± 0.11 <sup>a</sup>	2.19 ± 0.08 <sup>ab</sup>	2.56 ± 0.31 <sup>b</sup>	1.96 ± 0.08 <sup>a</sup>	1.97 ± 0.04 <sup>a</sup>
Iron	2.51 ± 0.11 <sup>b</sup>	2.64 ± 0.04 <sup>b</sup>	2.01 ± 0.05 <sup>ab</sup>	1.99 ± 0.00 <sup>a</sup>	2.23 ± 0.10 <sup>ab</sup>	2.50 ± 0.16 <sup>b</sup>	2.00 ± 0.32 <sup>ab</sup>	1.99 ± 0.00 <sup>a</sup>
Magnesium	26.87 ± 1.04 <sup>c</sup>	20.50 ± 0.88 <sup>ab</sup>	26.37 ± 0.36 <sup>c</sup>	19.85 ± 0.21 <sup>ab</sup>	22.36 ± 0.15 <sup>b</sup>	18.70 ± 0.28 <sup>a</sup>	22.18 ± 0.15 <sup>b</sup>	18.37 ± 0.00 <sup>a</sup>
Potassium	191.52 ± 1.63 <sup>d</sup>	177.96 ± 0.93 <sup>b</sup>	191.02 ± 1.59 <sup>d</sup>	177.33 ± 0.34 <sup>b</sup>	184.28 ± 1.71 <sup>c</sup>	161.51 ± 0.38 <sup>a</sup>	184.55 ± 1.69 <sup>c</sup>	161.18 ± 0.47 <sup>a</sup>
Sodium	11.97 ± 0.30 <sup>b</sup>	10.61 ± 0.26 <sup>a</sup>	11.91 ± 0.18 <sup>b</sup>	10.32 ± 0.21 <sup>a</sup>	12.96 ± 0.86 <sup>c</sup>	11.60 ± 0.52 <sup>b</sup>	13.18 ± 0.84 <sup>d</sup>	11.82 ± 0.61 <sup>b</sup>
Zinc	2.51 ± 0.22 <sup>b</sup>	2.67 ± 0.18 <sup>bc</sup>	2.00 ± 0.00 <sup>ab</sup>	1.98 ± 0.07 <sup>a</sup>	2.18 ± 0.00 <sup>ab</sup>	2.39 ± 0.00 <sup>b</sup>	1.99 ± 0.15 <sup>a</sup>	1.95 ± 0.13 <sup>a</sup>
Mean	34.25 ± 0.47 <sup>d</sup>	31.35 ± 0.37 <sup>bc</sup>	33.87 ± 0.35 <sup>cd</sup>	30.75 ± 0.14 <sup>b</sup>	32.09 ± 0.24 <sup>c</sup>	28.80 ± 0.24 <sup>a</sup>	32.58 ± 0.48 <sup>c</sup>	28.47 ± 0.19 <sup>a</sup>

Values are means ± SD of triplicate determinations while values with different superscript within the same row are significantly different @  $p < 0.05$ . SD: significant different; CHO: carbohydrate; n: Total number of respondents.

### 3.3 Vitamins Content of 24-hr recall food intake of the retirees

Likewise, the vitamins contents followed the same trends of mineral profiles determined. Significant differences ( $p < 0.05$ ) were also observed in all the vitamins content determined between the rural and urban area retirees in south-west Nigeria. The value of vitamin A ( $38.91 \pm 0.27 - 83.04 \pm 1.23$ ), vitamin B<sub>1</sub> ( $1.98 \pm 0.14 - 3.42 \pm 0.18$ ), vitamin B<sub>2</sub> ( $1.94 \pm 0.11 - 3.54 \pm 0.11$ ), vitamin C ( $9.98 \pm 0.17 - 15.58 \pm 0.19$ ) and vitamin K ( $2.63 \pm 0.11 - 4.48 \pm 0.18$ ) shows significant differences in food intake of both rural and urban area retirees in south-west Nigeria. The highest mean value

of  $34.25 \pm 0.47$  was obtained in Oluwole, an urban area while the lowest mean value was  $28.47 \pm 0.91$  (Gbogan, a rural area), respectively. The highest mean value ( $21.53 \pm 0.43$ ) was obtained in Lafenwa, an urban area while the lowest mean value of  $12.97 \pm 0.25$  was obtained in Ajyegbaju, a rural area, respectively. Based on the above result, nutrient content of the retirees in both rural and urban area of South-West Nigeria shows that there were significant different ( $p < 0.05$ ) among the two areas determined. This invariably mean that the retirees had enough micronutrients in their food intake despite their location be it rural or urban area of South-West Nigeria.

Tables 3: Vitamins Content of 24-hr recall food intake of the retirees

Parameter (100mg/g)	Lagos State		Ogun State		Ekiti State		Osun State	
	Oluwole (Urban)	Isele (Rural)	Lafenwa (Urban)	Ilugun (Rural)	Ado-Ekiti (Urban)	Ayegbaju (Rural)	Akarabata (Urban)	Gbogan (Rural)
Vitamin A	70.52 ± 0.68 <sup>d</sup>	69.92 ± 0.35 <sup>d</sup>	83.04 ± 1.23 <sup>ef</sup>	80.99 ± 0.53 <sup>e</sup>	50.18 ± 0.22 <sup>cd</sup>	38.91 ± 0.27 <sup>a</sup>	49.52 ± 0.14 <sup>c</sup>	43.42 ± 0.11 <sup>b</sup>
Vitamin B <sub>1</sub>	3.55 ± 0.13 <sup>c</sup>	2.95 ± 0.07 <sup>b</sup>	3.53 ± 0.06 <sup>c</sup>	1.98 ± 0.14 <sup>a</sup>	3.55 ± 0.33 <sup>c</sup>	3.42 ± 0.18 <sup>c</sup>	2.90 ± 0.22 <sup>b</sup>	2.92 ± 0.19 <sup>b</sup>
Vitamin B <sub>2</sub>	3.54 ± 0.11 <sup>cd</sup>	2.94 ± 0.20 <sup>bc</sup>	3.50 ± 0.19 <sup>cd</sup>	1.94 ± 0.15 <sup>a</sup>	3.94 ± 0.21 <sup>d</sup>	3.41 ± 0.26 <sup>c</sup>	2.88 ± 0.30 <sup>b</sup>	2.91 ± 0.13 <sup>b</sup>
Vitamin C	13.01 ± 0.72 <sup>cd</sup>	12.41 ± 0.08 <sup>cd</sup>	13.36 ± 0.54 <sup>c</sup>	11.24 ± 0.36 <sup>b</sup>	9.98 ± 0.17 <sup>a</sup>	15.58 ± 0.19 <sup>d</sup>	9.33 ± 0.35 <sup>a</sup>	15.34 ± 0.27 <sup>d</sup>
Vitamin K	4.48 ± 0.18 <sup>de</sup>	3.88 ± 0.29 <sup>c</sup>	4.18 ± 0.15 <sup>d</sup>	2.63 ± 0.11 <sup>a</sup>	4.08 ± 0.11 <sup>d</sup>	3.57 ± 0.33 <sup>bc</sup>	3.44 ± 0.19 <sup>bc</sup>	3.07 ± 0.12 <sup>b</sup>

Mean	19.02 ± 0.36 <sup>cd</sup>	18.42 ± 0.20 <sup>c</sup>	21.53 ± 0.43 <sup>d</sup>	19.75 ± 0.26 <sup>cd</sup>	14.36 ± 0.21 <sup>b</sup>	12.97 ± 0.25 <sup>a</sup>	13.82 ± 0.24 <sup>ab</sup>	13.49 ± 0.16 <sup>ab</sup>
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Values are means ± SD of triplicate determinations while values with different superscript within the same row are significantly different @  $p < 0.05$ . SD: significant different; CHO: carbohydrate; n: Total number of respondents.

### 3.4 Mean and standard deviation of health of retirees in south-west Nigeria

Table 4 shows the descriptive data with respect to the nutritional health of retirees in South-West Nigeria. Total respondents are 420, the minimum value is 0.00, while the maximum was 12.00. Though they

have a mean of  $8.83 \pm 2.61$  Standard Deviation, the mean value when compared with the standard as prescribed is above the mean of 6.00. This implies that averagely, the retirees are having a high nutritional health risk.

Table 4: Mean and standard deviation of health of retirees in south-west Nigeria

Variable	N	Min	Max	Mean	Std. Dev	Remarks
Health Status	420	0.00	12.00	8.83	2.61	High Health Risky

### 3.5 Mean and standard deviation of nutritional status of retirees in south-west Nigeria

Table 5 shows the descriptive data with respect to the nutritional status of retirees in South-West Nigeria. Total respondents' N = 420 comprising 214 male

retirees and 206 female retirees. The mean value for the males is 0.806 while it was 0.804 for the females. Comparing these values with the criteria, it is interpreted as "Normal" for male and "Risky" for the female retirees.

Table 5: Mean and standard deviation of nutritional status of retirees in south-west Nigeria

Sex	N	Min	Max	Mean	Std. Dev	Remarks
Male	204	0.649	0.907	0.806	0.059	Normal
Female	216	0.633	0.902	0.804	0.058	Risky

### 3.6 Hypothesis I: There is no significant difference in the food intake of retirees in rural and urban areas in South-West Nigeria

Table 6 shows the test of difference in the food intake of rural and urban retirees in South-West Nigeria. From the table, the number of rural retirees' respondents is 94 while the urban retirees are 146 and their mean values are 49.85 and 50.93 while standard deviations are 5.99 and 4.95 respectively. The t-value of -1.518 is not significant, because, the p-value (0.130) is greater than alpha level. Therefore, the null hypothesis is retained. This implies that irrespective of whether the retirees are in rural or urban areas the level of food intake is the same. The result of data analysis in response to hypothesis one indicated that there is no significant difference in the food intake of male and female retirees in South-West

Nigeria. Hence, the null hypothesis is retained, implying that irrespective of whether the retirees is male and female the level of food intake is the same. This could be as a result of decrease in calorie intake which are associated with a series of symptoms such as loss of taste bud, tooth, sore gum, ailment of diseases and many others, irrespective of their gender. In a similar study, Sanford (2017) highlighted that nearly 20-30% of elderly individuals suffer from anorexia which is a major contributor of frailty among both male and female. Study by Theou et al. (2015) found that 12 - 28 % elderly people are frail, with the highest prevalence among women than men whereas Campitelli et al. (2018) found frailty to be prevalent among 19 - 44 % of the elderly population both male and female. The decline in calorie intake is associated with numerous factors which aggravate the geriatric syndrome of anorexia.

Table 6: Independent samples t-test of difference in food intake of rural and urban retirees in south-west Nigeria

Location	N	Mean	Std. Dev.	Df	t-value	p-value (Sig. 2-tailed)
Rural	94	49.85	5.99	238	-1.518	0.130
Urban	146	50.93	4.95			

$\alpha = 0.05$ ;  $p > 0.05$  Not Significant

**3.7 Hypothesis II:** There is no significant relationship between food intake, health and nutritional status of retirees in South-West Nigeria.

Table 7 shows the Pearson's coefficient of correlation among food intake, health and nutritional status. From the table the correlation coefficients (r) between "Food Intake" and "Health" is 0.154 this value is positive but low, however, the value is significant. The correlation coefficient between "Food Intake" and "Nutritional Status," is - 0.065 which is negative, low and insignificant, as well as this between "Nutritional Status" and "Health" (- 0.074). The null hypothesis is rejected as far as the food intake and health of the retirees are concerned. This implies that increase in food intake corresponds to increase in health among retirees in South-West Nigeria. The answer to hypothesis showed that there is a significant positive and low relationship between food intake and health, but the relationship is a negative, low and insignificant between food intake and nutritional status, as well as between nutritional status and health. This could be because of good knowledge of food nutrient constitute to appropriate health as well as good nutritional status. Improved food intake has been shown to correlate positively with improved health among retirees (Getahun et al., 2016). The authors explained that good diet is essential to health promotion and to chronic disease management among these people. Aguila (2018) also posited that improved food intake is a necessary focus for public health and policy in tackling chronic disease and in supporting well-being and healthy life through old age. Therefore, food intake and healthy living can simultaneously be improved upon through good knowledge of food and nutrition and active dietary behavior.

Table 7: Correlation matrix of food intake, nutritional health and nutritional status of retirees in south-west Nigeria

N = 420		Food intake	Health	Nutritional Status
Food intake	Pearson Correlation	1		
	Sig. (2-tailed)			
Health Status	Pearson Correlation	0.154*	1	
	Sig. (2-tailed)	0.017		
Nutritional Status	Pearson Correlation	- 0.065	-0.074	1
	Sig. (2-tailed)	0.313	0.253	

\* = Correlation is significant at the 0.05 level (2-tailed).

## 4.0 Conclusion

The findings of this study showed that the retirees have high level of nutritional knowledge and food availability. This afforded them the opportunity to be able to choose the right food at the right and appropriate time. However, the level of food intake was found to be low which mean their nutritional health and status risk will be high. Finally, increase in food intake of the retirees corresponds to increase in their low nutritional health.

## 4.1 Recommendations

Based on the findings of this study, the following recommendations were made;

- i. More food should be made available in the locality either rural or urban areas for easy accessibility for the retirees to maintain good nutritional health and improve their nutritional status. Moreover, individuals should diversify their diet and engage in enough physical activity to help halt the rising prevalence of overweight and obesity among older adults which can lead to untimely death.
- ii. There is the need for nutritionists and other stakeholders to engage in active aging interventions to improve the nutritional status and quality of life of elders at the community settings at large.
- iii. Nutritionists and Dieticians should raise nutrition awareness among the older age group and the government structures since interventions to correct the nutritional status of elders are strongly required for a functionally active, good nutritional health and better quality of life.

## Acknowledgement

We acknowledge and appreciate The Tertiary Education Trust Fund (TETFUND) of Nigeria through Institution Based Research Grant (IBRG) and Federal College of Education (Special), Oyo authorities for funding the project in the selected states of south-west households, Nigeria. Moreover, we are highly indebted to the research assistants that were used for this study.

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6/21/2024