International Journal of Science and Research Archive
eISSN: 2582-8185
Cross Ref DOI: 10.30574/ijsra
Journal homepage: https://ijsra.net/

(RESEARCH ARTICLE)

Check for updates

Dietary pattern, nutritional status, and micronutrient levels in an elderly population in arochukwu local government area of Abia State, Nigeria

Oluchi Ajah Nnanna * and Nkiru Nwamaka Ezeama

Department of Community Medicine and Primary Health, Faculty of Medicine, Nnamdi Azikiwe University, Awka, Nigeria.

International Journal of Science and Research Archive, 2025, 14(03), 850-861

Publication history: Received on 02 February 2025; revised on 12 March 20215 accepted on 14 March 2025

Article DOI: https://doi.org/10.30574/ijsra.2025.14.3.0701

Abstract

Background: This study aimed to evaluate dietary patterns, nutritional status, and micronutrient levels among elderly adults in Arochukwu L.G.A, Abia State.

Statement of the problem: Meeting the diet and nutritional needs of older people is key for the maintenance of their health, functional independence and quality of life and as such the relationship between the dietary pattern, nutritional status and micronutrient level of the elderly population should be considered.

Methodology: This cross-sectional study employed the WHO modified cluster sampling technique to select 352 participants. Dietary patterns, demographic and socio-economic data were measured using a questionnaire, and serum levels of vitamins C, B12, zinc, and iron were assessed through serum concentration measurements using standardized laboratory protocols. Data were coded analysed using SPSS v21. and chi-square tests.

Results: The study revealed BMI proportions of participants as (39.2%) healthy weight, (38.9%) overweight and (21.9%) obesity. Dietary patterns varied, with 55.1% reporting fair appetite and 37.2% good appetite. Participants knowledge of basic nutrition was mostly good (71.3%). A significant percentage of participants were deficient in the micronutrients of study, including (47.6%) in vitamin C, (62.55%) in vitamin B12, (41.55%) in iron, and (27%) in zinc. Significant associations were found between BMI and zinc concentration, and between sociodemographic characteristics and vitamin B12 and iron serum concentrations.

Conclusion: This study highlights the need for targeted interventions addressing dietary patterns, nutritional knowledge, and micronutrient deficiencies among elderly adults. Recommendations include: implementation of nutritional education programs, vitamin-mineral supplementation, Integrated nutrition programs addressing micronutrient deficiencies, regular health checks, BMI monitoring and further research exploring sociodemographic factors influencing micronutrient levels.

Keywords: Dietary patterns; Nutritional status; Micronutrient levels; Elderly adults; Cross-sectional study

1. Introduction

Ageing is linked to a variety of changes in the body which can make one prone to nutrient deficiencies [8]. The elderly population is vulnerable to malnutrition due to various factors, including inadequate dietary intake, chronic diseases, and socioeconomic constraints [7]. Dietary pattern is the general profile of food and nutrient consumption which is characterized on the basis of the usual eating habits [3]. Nutritional status on the other hand is the condition of the body as a result of the intake, absorption and use of nutrition, as well as the influence of disease-related factors. [2]. The burden of micronutrients disorders however has been reported to fall greatly on the rural dwelling population which

* Corresponding author: Oluchi Ajah Nnanna

mostly constitutes of the elderly, retired from one active service or the other hence the selected study area [4], using Arochukwu L.G.A, Abia state as a case study. this study aimed to assess the dietary patterns, nutritional status, and micronutrient levels among elderly persons in Arochukwu Local Government Area of Abia State, Nigeria.

2. Material and methods

This was a cross-sectional study design. The study population consisted of male and female elderly persons aged 60-75 years residing in Arochukwu Local Government Area of Abia State, Nigeria. Ethics approval was obtained from the Nnamdi Azikiwe University Ethics Committee, and written informed consent was obtained from each participant through a consent form, ensuring their rights and privacy were protected. The WHO modified cluster technique was used to select the participants for this study [5]. The tools for data collection included a structured questionnaire, a scale, a stadiometer and biological sample tools. Data were coded and analysed using SPSS v21. and chi-square tests.

The questionnaires were administered by research assistants, who were picked from learned young adults of the community based on referral and trained to help the participants or their care givers understand and fill out the necessary information, a 7-day food diary was given to the participants or their care giver with instructions on how to fill out the necessary information about their daily meal intake, timing, size and preparation methods, once in a day a phone call was placed to all the participants or their care givers as a reminder to fill out the diary at the end of the 7-day duration the food dairy was then retrieved. The blood samples for the laboratory tests of micronutrient concentration relevant to this study were collected from the participants on day one, so the concentration will not be influenced by the 7-day intake. The blood samples were collected before 10am as it must be fasting by a laboratory technician recruited for the purpose of this study, 5mls venous blood samples were collected from each participant through venepuncture using sterile needle and syringe into a plain tube labelled with participant's ID, the tube was then inverted gently 5-10 times and the blood allowed to clot at room temperature for 15-30 minutes, then the samples were immediately transported to the laboratory at Michael Okpara University, Umudike in a sample box with ice, where the blood samples were spun in the centrifuge to separate serum and the serum obtained. The serum was then transferred to aliquot tubes and analysed for the concentration of vitamin C, vitamin B12, zinc and iron by the facility laboratory scientists

3. Results

The demographic characteristics of our study population, consisting of older adults with a mean age of 66.36 years, with a standard deviation of 5.88 years. The average weight was 71.77 kg (standard deviation of 15.19 kg), and the average height was 1.66 meters (standard deviation of 0.10 meters).

Table 1 Baseline characteristics (Age, Weight, Height, Gender and Body Mass Index)

Variable	**Mean**	**Standard Deviation**
Age	66.36	5.88
Weight	71.77	15.19
Height	1.66	0.10
	Frequency (N)	**Percentage (%)**
Gender		
Female	177	50.3
Male	175	49.7
BMI		
Under weight (<18.5)	9	26
Healthy weight (18.5 - 24.9)	138	39.2
Overweight (25.0 - 29.9)	137	38.9
Class 1 obesity (30 - <35)	48	13.6
Class 2 obesity (35 - 40)	18	5.1
Class 3 obesity (>40)	2	0.6

The gender distribution was almost equal, with females making up 50.3% of the participants and males 49.7%. The majority of the participants had a healthy weight (39.2%) or were overweight (38.9%), while 13.6% had class 1 obesity, 5.1% had class 2 obesity, and 0.6% had class 3 obesity. A small percentage (2.6%) were underweight.

Whereas, in another study on the Prevalence and pattern of overweight and obesity in three rural communities in southwest Nigeria showing the overall crude prevalence of overweight and obesity in the total population were 20.8% and 8.4%, respectively. Obesity increased across the age gradient, peaking in the 51 to 60-year age-group in men and women. Among the overweight and obese subjects, 70.9% of them were overweight and the remaining 29.1% were obese, with class 1 obesity accounting for 20.7% of these overweight and obese subjects. [18]

In terms of dietary patterns, 55.1% of the participants described their appetite as fair, 37.2% as good, and 7.7% as poor. Most participants (81.0%) had 2-3 meals per day, while 9.1% had 0-1 meal/day and 9.9% had more than 3 meals/day. The most commonly eaten meal was lunch (43.8%), followed by breakfast (31.5%) and dinner (24.7%). The most commonly skipped meal was breakfast (37.2%), followed by dinner (36.1%) and lunch (26.7%). The majority of participants did not take a vitamin-mineral supplement (95.5%). Most participants described their portion of meal as medium (76.4%), and their activity level as mildly active (76.4%). The majority of participants did not smoke (85.8%), and did not consider cost a problem for their feeding (87.2%).

Similarly, another study on nutritional and health Status of Older Persons Aged ≥ 60 Years in rural communities of Udi Local Government Area, Enugu State the dietary pattern of the respondents showed that most (55.5%) consumed food three times a day, 26.5% consumed food four times while 17.6% consumed it two times daily. Most of them (68.1%) skipped meals, out of which 57.4% skipped breakfast, 35.2% lunch and 7.4% dinner. Some (27.3%) consumed fruits twice a week while only 25.2% and 23.9% consumed it three times weekly and daily respectively. [13]

Table 2 Dietary Pattern of the Participants

Variable	**Frequency**	**Percentage (%)**
Participants' perception of appetite		
Fair	194	55.1
Good	131	37.2
Poor	27	7.7
Number of meals per day		
0-1 meal/day	32	9.1
2-3 meals/day	285	81.0
More than 3 meals/day	35	9.9
Meal usually eaten every day		
Breakfast	111	31.5
Dinner	87	24.7
Lunch	154	43.8
Meal usually skipped regularly		
Breakfast	131	37.2
Dinner	127	36.1
Lunch	94	26.7
How often do you eat vegetables and fruit?		
Daily	102	29.0
Monthly	88	25.0
Weekly	162	46.0

How often do you eat orange, lemon, paw-paw, grape, Udara, and banana?		
Daily	101	28.7
Monthly	98	27.8
Weekly	153	43.5
How often do you eat meat, liver, beef, chicken, pork, fish, whole egg, milk, and yogurt?		
Daily	105	29.8
Monthly	99	28.1
Weekly	148	42.0
How often do you eat unripe plantain, okra, beans, vegetable soup, millet, potatoes, cashew, bitter leaf soup, and semolina?		
Daily	74	21.0
Monthly	128	36.4
Weekly	150	42.6
How often do you eat tiger nut, okpa, ukpaka, ofada rice, periwinkle, snail, oat, dates/dabino, and avocado?		
Daily	47	13.4
Monthly	224	63.6
Weekly	81	23.0
Do you take a vitamin-mineral supplement?		
No	336	95.5
Yes	16	4.5
Size of meal portions		
Large	33	9.4
Medium	269	76.4
Small	50	14.2
Would you eat fruit or snack for lunch?		
Fruit	87	24.7
None	120	34.1
Snack	145	41.2
How many meals did you have yesterday?		
1	29	8.2
2	246	69.9
3	77	21.9
How many snacks did you have yesterday?		
1	77	21.9
2	30	8.5
3	5	1.4
None	240	68.2

In terms of lifestyle characteristics, majority 56% of the participants preferred to drink water, 17% preferred to drink juice beverage, 15.6% preferred alcohol beverages, 7.4% preferred soda beverages, and 4.0% preferred to drink milk beverages. 76.4% of the participants described their activity level as mildly active. The majority of participants did not smoke (85.8%), and did not consider cost a problem for their feeding (87.2%).

However, another study on nutritional and health Status of Older Persons Aged ≥ 60 Years in rural communities of Udi Local Government Area, Enugu showed that most of the respondent consumed carbonated drinks (37.4%) and milk drinks and (48.7%) consumed carbonated drinks more than two times a week, (40.3%) consumed beer while 26.1% and 20.6% consumed whisky/ brandy and wine respectively, (31.5%) took snuff. [13]

Table 3 Lifestyle Characteristics of the Participants

What type of beverage do you usually drink?		
Alcohol	55	15.6
Juice	60	17.0
Milk	14	4.0
Soda	26	7.4
Water	197	56.0
Describe your activity level		
Sedentary	19	5.4
Mildly active	269	76.4
Very active	64	18.2
Do you smoke?		
No	302	85.8
Yes	50	14.2
Is cost a problem for your feeding?		
No	307	87.2
Yes	45	12.8

In terms of nutritional status, participants when asked about their knowledge of basic nutrition, 71.3% of the participants reported having good knowledge, 6.3% reported having intermediate knowledge, and 22.4% reported having poor knowledge.

However, the results of another study on the knowledge and nutritional status of elderly found that the majority of the elderly have less knowledge about nutrition and the majority of the nutritional status of the elderly was in the poor category. [15]

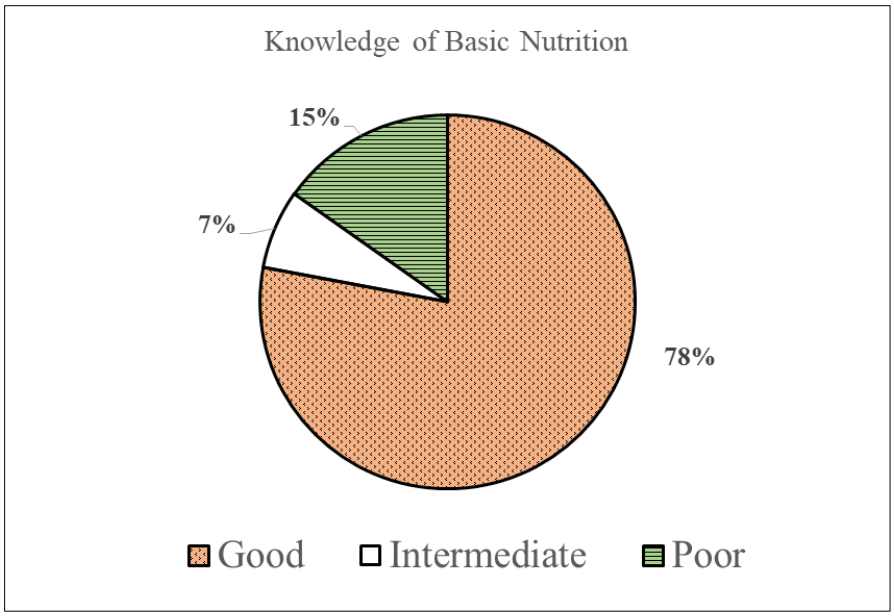

Figure 1 Knowledge of Basic Nutrition

In terms of micronutrient serum concentration of the participants, 47.6% were deficient in vitamin C, 44.9% were in the normal range, and 7.5% were hypervitaminosis. For zinc, most (72%) of the participants were in the normal range, 27% were deficient, and 1% were hypervitaminosis. For vitamin B12, most (62.55%) of the participants were deficient, 36.25% were in the normal range, and 1.2% were hypervitaminosis. For iron, 56.45% of the participants were in the normal range, 41.55% were deficient, and 2% were hypervitaminosis. Distributions of the micronutrients assessed are shown in Table 4.

In a study on the serum micronutrient status and nutrient intake of elderly Yoruba people in a slum of Ibadan, Nigeria, found that the majority of the participants had insufficient serum levels of vitamins and minerals relative to reference values, 40% were deficient in serum Ca, 71 % were deficient in serum Zn and 51 % were deficient in serum 25-hydroxyvitamin D. [14] In another study to evaluate serum levels of vitamin C in patients aged between 45 and 60 years with and without age-related cataract, one hundred and seventy-eight serum vitamin C assays were analysed (response rate of 98.9%). One hundred and fifty-eight (88.8%) participants had low levels of vitamin C, whereas 20 (11.2%) had normal levels. [9]

Table 4 Vitamin C, Vitamin B12, Zinc and Iron Serum Concentration of the Participants

Micronutrient	Number (%)	Mean	Standard Deviation
Vitamin C (mcg/dL)			
Deficient	140 (47.6%)	325	143.6
Normal	132 (44.9%)	1300	700
Hypervitaminosis	22 (7.5%)	2288.8	134.1
Zinc (mcg/dL)			
Deficient	143 (48.6%)	57.5	4.61
Normal	150 (51.0%)	90	15.7
Hypervitaminosis	1 (0.3%)	135.3	17.3
Vitamin B12 (mcg/dL)			
Deficient	122 (41.5%)	0.01	0.0005
Normal	170 (57.8%)	0.03	0.02

Hypervitaminosis	2 (0.7%)	0.05	0.003
Iron (mcg/dL)			
Deficient	122 (41.5%)	72.5	1.7
Normal	166 (56.5%)	137	49.8
Hypervitaminosis	6 (2.0%)	184	12.5

The cross-tabulation between dietary pattern and blood concentration of selected micronutrients (Vitamin C, Zinc, Vitamin B12, Iron) showed varying distributions is presented in Table 5. However, the chi-square tests indicated no significant association between dietary pattern and the blood concentration of these micronutrients, as all p-values were greater than 0.05.

Similarly, a study on the association of micronutrient, dietary pattern and sarcopenia among US adult aged 20-59 years showed a negative association between most single micronutrient and sarcopenia. [17]

Table 5 Association between the Dietary Pattern and the Blood Concentration of Selected Micronutrients among Older Persons Aged 60-75 years Living in Arochukwu L.G.A, Abia State.

Micronutrient	**Dietary Pattern Number (%)**			**χ2**	**p-value**
	Poor	**Fair**	**Good**		
Vitamin C (mcg/dL)				2.37	0.67
Deficient	12(4.1%)	71(24.1%)	57(19.4%)		
Normal	9(3.1%)	72(24.5%)	51(17.3%)		
Hypervitaminosis	3(1.0%)	13(4.4%)	6(2.0%)		
Zinc (mcg/dL)				2.61	0.63
Deficient	12(4.1%)	74(25.2%)	57(19.4%)		
Normal	12(4.1%)	87(29.6%)	71(24.1%)		
Hypervitaminosis	0(0.0%)	1(0.3%)	0(0.0%)		
Vitamin B12 (mcg/dL)				4.43	0.35
Deficient	12(4.1%)	67(22.8%)	43(14.6%)		
Normal	12(4.1%)	87(29.6%)	71(24.1%)		
Hypervitaminosis	0(0.0%)	2(0.6%)	0(0.0%)		
Iron (mcg/dL)				2.09	0.72
Deficient	10(3.4%)	61(20.7%)	51(17.3%)		
Normal	14(4.8%)	92(31.3%)	60(20.4%)		
Hypervitaminosis	0(0.0%)	3(1.0%)	3(1.0%)		

The cross-tabulation between nutritional status (BMI) and blood concentration of selected micronutrients showed varying distributions. The chi-square tests indicated a significant association between nutritional status and Zinc concentration (p-value = 0.017), but no significant associations with Vitamin C, Vitamin B12, or Iron, as their p-values were greater than 0.05.

Table 6 Association Between the Nutritional Status and the Blood Concentration of Selected Micronutrients Among Older Persons Aged 60-75 Years Living in Arochukwu L.G.A, Abia State

Micronutrient	Nutritional Status (BMI)				χ2	p-value
	Under weight	Healthy weight	Over weight	Obesity		
Vitamin C (mcg/dL)					7.99	0.63
Deficient	3 (0.9%)	24 (6.9%)	36(10.4%)	21(6.1%)		
Normal	6(1.7%)	86(24.8%)	80(23.1%)	38(11.0%)		
Hypervitaminosis	0(0%)	24(6.9%)	21(6.1%)	8(2.3%)		
Zinc (mcg/dL)					35.55	0.02
Deficient	5(1.4%)	11(3.2%)	17(4.9%)	10(2.9%)		
Normal	2(0.6%)	123(35.4%)	117(33.7%)	54(15.6%)		
Hypervitaminosis	0(0%)	4(1.2%)	3(0.9%)	1(0.3%)		
Vitamin B12 (mcg/dL)					17.88	0.60
Deficient	2(0.6%)	37(10.7%)	54(15.6%)	32(9.2%)		
Normal	9(2.6%)	91(26.2%)	74(21.3%)	31(8.9%)		
Hypervitaminosis	0(0%)	10(2.9%)	9(2.6%)	5(1.4%)		
Iron (mcg/dL)					4.17	0.65
Deficient	3(0.9%)	28(8.1%)	39(11.2%)	20(6.3%)		
Normal	6(1.7%)	99(28.5%)	90(25.9%)	43(12.4%)		
Hypervitaminosis	1(0.3%)	11(3.2%)	8(2.3%)	5(1.4%)		

The cross-tabulation between dietary pattern and sociodemographic showed varying distributions in age and gender is shown in Table 7. The chi-square tests however indicated no significant association between dietary pattern and the male (p-value = 0.18) and female participants (p-value = 0.46), as p-value was greater than 0.05.

However, another study on dietary patterns and socioeconomic factors of adherence among adults in urban Burkina Faso showed an adherence to the meat and egg-based pattern was associated with younger age, male sex, higher education, and an advanced economic situation; the fish-based pattern was associated with female sex, a higher education, and a higher economic status; whereas the starchy food-based pattern was related with younger age, and sharing a house with other adults. [16]

Table 7 Association Between the Sociodemographic Characteristics and the Dietary Pattern of the Elderly Aged 60-75 years Living in Arochukwu L.G.A, Abia state.

Sociodemographic Characteristics	Dietary pattern				χ2	p-value
	Iron-rich diet	Vit. C-rich diet	Vit. B12-rich diet	Zinc-rich diet		
Male					8.88	0.18
60-64 years	14(10.1%)	16(11.6%)	13(9.4%)	5(3.6%)		
65-69 years	17(12.3%)	10(7.2%)	7(5.1%)	11(8.0%)		
70-75 years	11(8.0%)	19(13.8%)	7(5.1%)	8(5.8%)		
Female					5.70	0.46
60-64 years	20(10.7%)	23(12.2%)	23(12.2%)	8(4.3%)		
65-69 years	19(10.1%)	15(8.0%)	10(5.3%)	9(4.8%)		
70-75 years	21(11.2%)	22(11.7%)	13(6.9%)	5(2.7%)		

The cross-tabulation between the vitamin C serum concentration and sociodemographic of participants showed varying distributions in age and gender is shown in Table 8. However, the chi-square tests indicated no significant association between the vitamin C serum concentration and sociodemographic of participants. as the p-values were greater than 0.05.

Another study shows that serum vitamin C levels were significantly higher among the male participants in each group (P=0.004). Serum vitamin C was found to have a weak positive correlation with the age of the participants (P=0.577). [9]'

Table 8 Association between the Sociodemographic Characteristic and Vitamin C Status of the Elderly Aged 60-75 years Living in Arochukwu L.G.A, Abia state

Sociodemographic Characteristics	**Vitamin C Status Number (%)**			**χ2**	**p-value**
	Deficient	**Normal**	**Hypervitaminosis**		
Male				5.63	0.23
60-64 years	20 (6.8%)	24 (8.2%)	4 (1.4%)		
65-69 years	30 (10.2%)	20 (6.8%)	1 (0.3%)		
70-75 years	28 (9.5%)	20 (6.8%)	1 (0.3%)		
Female				5.71	0.22
60-64 years	18 (6.1%)	32 (10.9%)	6 (2.0%)		
65-69 years	18 (6.1%)	14 (4.8%)	6 (2.0%)		
70-75 years	26 (8.8%)	20 (6.8%)	6 (2.0%)		

The cross-tabulation between the vitamin B12 serum concentration and sociodemographic of participants showed varying distributions in age and gender is shown in Table 9. The chi-square tests indicated a significant association between vitamin B12 serum concentration and sociodemographic (p-value = 0.00001, for the male participants and p-value =0.003, for the female participants).

Similarly, in another cross-sectional study of 7,963 healthy individuals (aged 18-65) designed to examine gender differences in vitamin B12 deficiency among a healthy population found that men had a higher prevalence of vitamin B12 deficiency (25.5%) compared to women (18.9%) [12]

Table 9 Association between the Sociodemographic Characteristic and Vitamin B12 Status of the Elderly Aged 60-75 years Living in Arochukwu L.G.A, Abia state

Sociodemographic Characteristics	**Vitamin B12 Status Number (%)**			**χ2**	**p-value**
	Deficient	**Normal**	**Hypervitaminosis**		
Male				83.9	0.00001
60-64 years	1 (0.3%)	24 (8.2%)	24 (8.2%)		
65-69 years	34 (11.6%)	16 (5.4%)	1 (0.3%)		
70-75 years	40 (13.6%)	6 (2.0%)	2 (0.7%)		
Female				16.3	0.003
60-64 years	26 (8.8%)	30 (10.2%)	1 (0.3%)		
65-69 years	28 (9.9%)	10 (3.4%)	1 (0.3%)		
70-75 years	32 (10.9%)	20 (6.8%)	1 (0.3%)		

The cross-tabulation between the zinc serum concentration and sociodemographic of the participant showed varying distributions in age and gender is shown in Table 10. However, the chi-square tests indicated no significant association between zinc serum concentration and sociodemographic of the participants. as the p-values were greater than 0.05.

Similarly, in another study aimed of 100 children (aged 5-60 months) aimed to determine the serum zinc levels of children attending the paediatric outpatient clinic of a tertiary hospital in South East Nigeria and to assess their need for routine zinc supplementation found that 26% had low serum zinc levels (<80 μg/dl), with no significant difference in zinc levels between males and females. [10]

Table 10 Association between the Sociodemographic Characteristic and Zinc Status of the Elderly Aged 60-75 years Living in Arochukwu L.G.A, Abia state

Sociodemographic Characteristics	**Zinc Status Number (%)**			**$\chi 2$**	**p-value**
	Deficient	**Normal**	**Hypervitaminosis**		
Male				6.7	0.2
60-64 years	6 (20.4%)	42 (14.3%)	1 (0.3%)		
65-69 years	14 (4.8%)	34 (11.6%)	2 (0.7%)		
70-75 years	16 (5.4%)	32 (10.9%)	1 (0.3%)		
Female				0.9	0.9
60-64 years	16 (5.4%)	40 (13.6%)	1 (0.3%)		
65-69 years	10 (3.4%)	28 (9.5%)	1 (0.3%)		
70-75 years	18 (6.1%)	34 (11.6%)	1(0.3%)		

The cross-tabulation between the iron serum concentration and sociodemographic of participants showed varying distributions in age and gender is shown in Table 11. The chi-square tests indicated a significant association between the iron serum concentration and sociodemographic of participants as p-value = 0.01, for the male participants and p-value =0.01, for the female participants.

Similarly, in another study of 252 institutionalized elderly subjects (aged 65-96) aimed to investigate iron status in institutionalized elderly subjects and to determine its association with different factors including: age, gender, body mass index, dietary intake, consumption of iron supplements, functional status and disease found that 25.4% had anaemia, and poor iron status was more common in men than women, with haemoglobin concentration positively associated with dietary intake and negatively associated with age, BMI, and functional status. [11]

Table 11 Association between the Sociodemographic Characteristic and Iron Status of the Elderly Aged 60-75 years Living in Arochukwu L.G.A, Abia state

Sociodemographic Characteristics	**Iron Status Number (%)**			**$\chi 2$**	**p-value**
	Deficient	**Normal**	**Hypervitaminosis**		
Male				13.4	0.01
60-64 years	8 (2.7%)	38 (10.2%)	2 (0.7%)		
65-69 years	22 (7.5%)	28 (9.5%)	1 (0.3%)		
70-75 years	24 (8.2%)	22 (7.5%)	2 (0.7%)		
Female				14.2	0.01
60-64 years	16 (5.4%)	40 (13.6%)	1 (0.3%)		
65-69 years	22 (7.5%)	40 (13.6%)	2 (0.7%)		
70-75 years	30 (10.2%)	22 (7.5%)	1 (0.3%)		

4. Discussion

The study's findings are consistent with previous studies, which reported similar dietary patterns and nutritional status among elderly populations [1.6]. The significant association between zinc concentration and BMI, and between sociodemographic characteristics and iron and vitamin B12 serum concentrations, suggests that nutritional status and micronutrient levels are influenced by various factors.

In summary, this data provides valuable insights into the health, dietary habits, and nutritional knowledge of older individuals in Arochukwu L.G.A, Abia state. It highlights the importance of maintaining a balanced diet and healthy lifestyle, and the need for nutritional education and support in this population and researchers advise the community, especially the elderly, to be active in activities held by local health workers to gain and improve knowledge, especially those related to the nutritional needs of the elderly.

5. Conclusion

The study concludes that older individuals in Arochukwu L.G.A, Abia state, with relatively balanced gender distribution, have healthy weight or are overweight. Dietary patterns are varied, with a significant number of participants having fair appetite and skipping breakfast. Nutritional knowledge is mostly basic, that is understanding fundamental nutrition concepts. Most of the participants were deficient in vitamin C and vitamin B12, but had normal ranges in zinc and iron. Significant association was found between Zinc concentration and BMI and between sociodemographic of participants and iron and vitamin B12 serum concentration of participants.

Compliance with ethical standards

Acknowledgments

The author wishes to acknowledge and give her warmest thanks to her supervisor, Dr. Nkiru N. Ezeama, who made this work possible and for her guidance and advice all through the stages of writing this thesis.

The author would also like to thank the Faculty thesis defence committee members for making the research process to be smooth, and for their brilliant comments and suggestions.

The author would also like to give special thanks to all the academic and non-academic staff at the department, especially the desk officer Madam Obiageli Oraka and to her family as a whole for their continuous support, prayers, and understanding when undertaking this research and writing her project.

Statement of ethical approval

Ethics approval was sought from the Nnamdi Azikiwe University Ethics Committee before the study was carried out and before the study materials were administered (REF: NAU/HREC/2S/02/12/2023/05).

Statement of informed consent

Written informed consent was obtained from the participant through a consent form, which was given to each participant or their relative, the content of the form was be explained to the participant while assuring that all necessary measures to keep their data private has been put in place and also informing them of their freedom to withdraw from the study at any time without any repercussions then they were allowed to decide to sign the form or not.

References

[1] Lentjes MAH, Welch AA, Khaw KT, Luben RN, Bingham SA. Trends in food intake in the United Kingdom from 1986 to 2000-2001. Br J Nutr 2014; 112(7): 1145-1153.

[2] Maastricht University Medical Center. Nutritional assessment [Internet]. 2012 [cited 2024 Feb 20].

[3] Omage K, Omuemu VO. Assessment of dietary pattern and nutritional status of undergraduate students in a private university in southern Nigeria. Food Sci Nutr 2018; 6(7): 1890–1897.

[4] Ryan R. How your nutritional needs change as you age [Internet]. Healthline; 2017 [cited 2024 Feb 20].

[5] World Health Organization. WHO STEPS surveillance manual: the WHO Stepwise approach to chronic disease risk factor surveillance. Geneva: World Health Organization; 2011.

[6] World Health Organization. Nutrition for older persons [Internet]. Geneva: World Health Organization; 2018 [cited 2024 Feb 20].

[7] World Health Organization. Physical activity [Internet]. Geneva: World Health Organization; 2018 [cited 2024 Feb 20].

[8] Gluckman P. Nutrition and ageing. J Sci Food Agric 2020 Jan;100(1):3-4.

[9] Kalambe AS, Muhammad RC, Ayanniyi AA, Imam A. Serum Levels of Vitamin C among patients with and Without Age-Related Cataract at The University of Abuja Teaching Hospital. 2022.

[10] Kennedy CU, Chukwuebuka NO, Uchenna E. Serum Zinc levels in apparently healthy children in Nigeria. Niger Med J 2020;61:291-6.

[11] Lopez-Contreras MJ, Zamora-Portero S, Lopez MA, Marin JF, Zamora S, Perez Llamas F. Dietary intake and iron status of institutionalized elderly people: Relationship with different factors. J Nutr Health Aging 2010;14(10):816-21.

[12] Margalit I, Cohen E, Goldberg E, Krause I. Vitamin B12 Deficiency and the Role of Gender: A Cross-Sectional Study of a Large Cohort. Ann Nutr Metab 2018;72(4):265-71.

[13] Nzeagwu OC, Ozougwu CB. Nutritional and Health Status of Older Persons Aged ≥ 60 Years in Rural Communities of Udi Local Government Area, Enugu State, Nigeria. J Dietitians Assoc Nigeria 2019;10.

[14] Olayiwola IO, Ketiku AO. Socio-demographic and nutritional assessment of the elderly Yoruba's in Nigeria. Asia Pac J Clin Nutr 2006;15(1):95-101.

[15] Nasution SZ, Siregar CT, Ariga RA, Haykal MR. Knowledge and Nutritional Status of Elderly. IOP Conf Ser Earth Environ Sci 2021;709(1):012011.

[16] Weil K, Coulibaly I, Fuelbert H. Dietary patterns and their socioeconomic factors of adherence among adults in urban Burkina Faso: a cross-sectional study. J Health Popul Nutr 2023;42:107.

[17] Yining L, Xiangliang L, Linnan D, Yixin Z, Yuwei H, Wei L, et al. Associations of micronutrient dietary patterns with sarcopenia among US adults: a population-based study. Front Nutr 2024;11