



(RESEARCH ARTICLE)



Assessment of the consumption pattern and health benefits of fruits among retirees from tertiary institutions in Delta state, Nigeria

OKORUWA, Juliet Obiageli *, ARUBAYI, Diana Oritsegbubemi and AZONUCHE, Juliana Ego

Department of Vocational Education, Home Economics Education Unit, Delta State University, Abraka.

World Journal of Advanced Research and Reviews, 2026, 29(02), 1243-1253

Publication history: Received on 07 January 2026; revised on 15 February 2026; accepted on 18 February 2026

Article DOI: <https://doi.org/10.30574/wjarr.2026.29.2.0383>

Abstract

This study assessed the consumption patterns and health benefits awareness of fruits among retirees in Delta State. Three research questions and three corresponding null hypotheses guided the study. The study employed an ex-post facto research design, using the survey method. The population consisted of one thousand, one hundred and sixteen (1,116) retirees (from 2019–2024), and the sample size was 446 retirees was selected using multi-stage sampling of stratified and simple random sampling techniques. The instrument used was questionnaire validated by three (3) experts, and the reliability was established using a Cronbach alpha method of establishing reliability which yielded a coefficient index of 0.78 for Types of Fruits; 0.71 for Consumption Pattern of Fruits and 0.70 for Health Benefits of Consuming Fruits. Data collected were analyzed using Statistical Package for Social Sciences (SPSS, Version 29). The research questions were answered using Frequency Count, Percentage, Mean and Standard Deviation (SD) while the null hypotheses were tested using independent t-test statistical tools at a 0.05 level of significance. The findings showed that there is no significant difference between male and female retirees on the types of fruits consumed, there is a significant difference between urban and rural retirees on the consumption pattern of fruits and there is a significant difference between junior and senior retirees on the perceived health benefits of fruits. Based on the findings of the study, it was recommended that awareness campaign should be carried out on consumption patterns of fruits in the rural areas to enhance better consumption pattern.

Keywords: Retirees; Consumption patterns; Functional foods; Health benefits

1. Introduction

Food plays a crucial role in sustaining life, providing nourishment, and impacting overall health and well-being. These roles start from the earliest stages of life, even before birth, and continue throughout every stage of life. Consuming nutritious food as a choice at each stage supports growth, development, and long-term health. Consumption of food refers to the act of eating food for nourishment and sustenance. It encompasses the entire process, from selecting and acquiring food to preparing and consuming it. Eating food can be interesting and can also be affected by some factors such as time, habits, choices, health, and others. Understanding and dealing with these factors provides a basis for defining and understanding food consumption patterns. Food consumption pattern refers to the habits, preferences, and behaviours people exhibit regarding the types and quantities of food they consume. Ferreira et al. (2019) opined that the food consumption pattern of an individual is essential to the evaluation of their nutritional and health status.

The ageing and retiree population (60 years and above) is increasing globally and becoming an important proportion of the population in developing countries (World Health Organisation [WHO], 2025). Retirees are individuals who have withdrawn from active services based on their chronological age or years of service. In Nigerian universities, it is usually 70 years of age for professors, and other members of staff retire at the age of 65. The World Population Prospects

* Corresponding author: OKORUWA, Juliet Obiageli

established that by 2050, 1 in 6 people in the world will be over the age of 65 (United Nations, 2019). The period of statutory retirement is a critical stage in life, accompanied by changes in health, behaviours, food habits, and consumption (Stenholm & Vahtera, 2017). Retirees are identified to be susceptible to nutritional deficiencies resulting from poor food consumption patterns (Norman et al., 2021). Hence, in promoting health and prolonging the lives of retirees, a food consumption pattern that includes an adequate intake of Fruits is essential. A lower risk of chronic diseases, a better quality of life, and longevity are associated with a diet rich in Fruits (Schulze et al., 2018). These Fruits can be regarded as functional foods because they not only provide essential vitamins and minerals but also provide significant health benefits when they are consumed at a sufficient level as part of a diversified diet regularly. The World Health Organisation recommends that Fruits be consumed per day to meet the body's needs (Food and Agriculture Organisation of the United Nations [FAO], 2019). Fruits are considered functional foods because they are not only essential to life but also play significant roles in the prevention of diseases and the reduction of disease risk factors (Essa et al 2023).

Fruits are an important part of a healthy diet, and inadequate intake of Fruits has been reported as part of the major contributors to nutritional problems in Nigeria (Obayelu, 2019). Fruits are the freshly or dry-ripened ovary of a flowering plant, enclosing the seed or seeds. They are a rich source of a wide range of nutrients, including vitamins, minerals, proteins, dietary fibres, and biologically active compounds such as polyphenols and carotenoids that are either alone or in combination with other food groups such as cereals, vegetables, spices, and nuts, which are essential for dietary disease prevention. Some examples of fruits are mangoes, oranges, cashews, bananas, Berries, and pineapple. Fruits are seasonal foods, and some may not be available throughout the year for consumers. When in season, they are abundant and fresh, available at affordable prices. Fruits can be consumed fresh, canned, or as juice. However, one leading challenge influencing the consumption pattern of Fruits in Nigeria is inadequate storage and processing facilities. This challenge is subjecting fresh Fruits to spoilage and reduced shelf life. Like fruits, vegetables are also subject to spoilage. However, all of these processing and preservation techniques have varying effects on Fruits' nutritional and physical value.

The health benefits of fruits refer to the positive physiological effects they exert on the body, primarily through their rich content of essential nutrients, phytochemicals, antioxidants, and bioactive compounds that promote well-being and reduce disease risk (Slavin & Lloyd, 2012; Yashin et al., 2017). Health benefits encompass improvements in immune function, enhanced digestive and cardiovascular health, reduced oxidative stress, and a lower likelihood of developing chronic non-communicable diseases such as diabetes, cancer, and hypertension (Schulze et al., 2018; Norman et al., 2021). Regular consumption of fruits provides vital vitamins, minerals, and dietary fiber that support metabolic efficiency and gut health, while spices contribute bioactive components with anti-inflammatory, antimicrobial, and antioxidant properties that protect body tissues from cellular damage (Gottardi et al., 2016; Ozkur et al., 2022). Hence, maintaining a diet abundant in these foods contributes significantly to healthy ageing and overall quality of life, countering the physiological decline often observed in older adults. These benefits are particularly relevant as dietary patterns in later life influence disease prevention and management, aligning with evidence that consistent intake of fruits mitigates the health challenges described by Celidoni et al. (2020). Therefore, this study sought to assess the consumption pattern and nutritional benefits of fruits among retirees in tertiary institutions in Delta State.

Food consumption pattern refers to the habitual way in which individuals or populations consume food and beverages, including the types, quantities, frequencies, and contexts of consumption. It encompasses dietary behaviours, preferences, and choices over time, influenced by factors such as income, health, and food availability. Food availability influences the consumption pattern of any food a great deal, as acknowledged by the World Health Organisation (2025); the accessibility of nutrient-dense foods such as fruits whole grains, lean protein, and healthy fats should be easy. When these foods are readily available, individuals are more likely to include them in their diets, thus leading to healthier consumption patterns. Consumption of fruits and vegetables is aimed at having an active lifestyle, which can support ageing. As people grow older, their eating habits and choice of food change. Changes in food habits or choice of food are a result of the quest for sustainable health.

Fruit consumption is an important source of nutrients for healthy growth and development, as well as a protective factor against chronic non-communicable diseases. In response to the paucity of data on Adolescents' fruit consumption in Ghana, Seidu et al. (2021) conducted a study on determinants of fruit consumption among 2786 in-school adolescents in Ghana. Data for this study were extracted from the 2012 Global School-Based Health Survey. The findings revealed that fruit consumption among Ghanaian adolescents is relatively low. Sex of adolescents, grade, soft drink intake, fast food consumption, and sedentary behaviour were factors associated with adequate fruit and vegetable consumption. The empirical study and the current study share common interest in understanding the factors that influence the consumption of fruits, though the empirical study focuses on school adolescents in Ghana, aiming to understand the determinants of fruits and vegetable consumption among younger population, the current study examines the

consumption pattern of fruits among retirees in tertiary institutions in Delta state, Nigeria, focusing on older adults. Both studies are in West African countries, although in different regions, which provides a comparative perspective on dietary habits and other influencing factors. Both studies emphasised the health benefits of consuming fruits for growth, development, and preventing future health issues among different population groups, and for maintaining health, managing chronic diseases among retirees.

Silva et al. (2017) assessed the knowledge and consumption patterns of fruits among junior secondary school students. This cross-sectional descriptive study was conducted among 220 randomly selected junior high school students in Surulere, Lagos. Data were obtained using an interviewer-administered questionnaire and analysed using Epi Info Version 7 statistical software. The majority (84.9%) of the respondents in this study had good knowledge of the nutritional and health values of fruits; however, the consumption of fruits was appropriate in only 5.48% of the respondents, having five portions of fruits daily. Parental intake, encouragement, and supervision, as well as availability and accessibility to fruits at home, were motivators for appropriate consumption. The current study is related to this research work in that both studies focus on the consumption patterns of fruits. They aim to understand how these dietary habits influence health outcomes in different populations. Both studies target specific population groups; the empirical study focuses on junior secondary school students, while the current study examines retirees in a tertiary institution. Again, both studies assess the knowledge of the specific group regarding the benefits of fruits. This will help to identify gaps in awareness and areas where educational intervention could be beneficial. The difference between both research is that the empirical study examines how their nutritional knowledge affects the consumption of fruits, while the current study on retirees examines how a diet rich in fruits, can promote sustainable health and prevent age-related diseases.

Olatona et al. (2018) assessed the knowledge and consumption patterns of fruits and vegetables, and associated factors among adults in Lagos, Nigeria. This cross-sectional descriptive study employed a multistage sampling method to select 330 adults from one local government area in Lagos State. Data was collected using structured interviewer-administered questionnaires. The findings showed that only 24.9% of respondents had a good level of knowledge, while 27.0% consumed an adequate amount of fruits and vegetables. Orange and pumpkin were the most frequently consumed fruits and vegetables, respectively. Educational status, income, female gender, and marriage were associated with adequate intake of fruits and vegetables. Both studies assessed the knowledge and consumption patterns of fruits and vegetables; the current study includes not only fruits and vegetables but also spices. However, while the empirical study focuses on adults in Lagos State, the current study's focus is on older adults (Retirees) in Delta State, both in Nigeria.

1.1. Research Questions

The following research questions guided the study

- What are the types of Fruits consumed among retirees from Tertiary Institutions in Delta State, Nigeria?
- What is the consumption pattern of Fruits among retirees from tertiary institutions in Delta State, Nigeria?
- What are the perceived health benefits of consuming Fruits by retirees from tertiary institutions in Delta State, Nigeria?

1.2. Research Hypotheses

The following null hypotheses were formulated to guide the study;

- Ho1: There is no significant difference between the mean responses of male and female retirees regarding the types of Fruits consumed among retirees from tertiary institutions in Delta state
- Ho2: There is no significant difference between the mean responses of urban and rural retirees regarding the consumption pattern of fruits among retirees from tertiary institutions in Delta State.
- Ho3: There is no significant difference between the mean responses of junior and senior retirees regarding the perceived health benefits of fruits among retirees from tertiary institutions in Delta State.

2. Methods

2.1. Design of the Study

This study adopted an ex-post facto research design and used survey research in this design. This design is therefore suitable for the research because it seeks to establish and describe the consumption pattern of Fruits among retirees from tertiary institutions in Delta State.

2.2. Population of the Study

The population of the study comprised 1116 (male and female) retirees across the tertiary institutions in the three Senatorial Zones (Delta North, Delta South, and Delta Central) in Delta State, Nigeria, from 2019 to 2024.

2.3. Sample and Sampling Technique

The sample size for the study consisted of four hundred and forty-six (446) retirees (2019 - 2024) in the three senatorial zones in Delta State using multistage sampling procedure of stratified and simple random sampling techniques.

2.4. Instrument for Data Collection

The data was collected using a multicomponent questionnaire titled "Consumption Patterns and Health Benefits of Fruits Questionnaire" (CPHBFQ). This questionnaire contained two parts: Part I solicited data on demographic characteristics of respondents (retirees), which included their gender, age, location, and job status at retirement. Part II comprised sections A-C, with each section designed to address a specific research question that was answered by retirees. Section A assessed the types of fruits, consumed by retirees; Section B assessed the retirees' consumption pattern of fruits; Section C assessed the perceived health benefits of consuming fruits among retirees. The section A and C consist of (27) closed ended questionnaire items with a four (4) point rating scale of Strongly Agree (SA) (4), Agree (A) (3), Strongly Disagree (SD) (2), and Disagree (D) (1); Sections B questionnaire contain items with five (5) point rating scale of Daily (5), Often (2-4times weekly) (4), Occasionally (Once weekly) (3), Rarely (Monthly) (2), and Never (1)

2.5. Validity of the Instrument

The instrument was validated by three experts, two from the Department of Vocational Education and one from the Department of Guidance and Counselling (Measurement and Evaluation) in the Faculty of Education, all at Delta State University, Abraka.

2.6. Reliability of the Instrument

The instrument was administered to 100 respondents in Edo State to estimate the reliability of the instrument. The data obtained from the pilot study were subjected to a reliability test using Cronbach's alpha reliability coefficient. It yielded the following coefficient; 0.78 for Types of Fruits; 0.71 for Consumption Pattern of Fruits and 0.700 for Health Benefits of Consuming Fruits as Perceived by Retires

2.7. Method of Data Collection

The questionnaires were administered to the respondents with the aid of five (5) research assistants who briefed the respondents before administering the questionnaire. This enabled the researcher to have more coverage, with a week's interval between the 3 zones. The research instruments were administered and retrieved on the spot from the retirees.

2.8. Method of Data Analysis

The data obtained were sorted, organised, and coded into Statistical Package for Social Sciences (SPSS) Version 28. The data collected were analysed for descriptive statistics (frequency count, percentages, mean, and standard deviations) and inferential statistics. Mean and Standard Deviation (SD) were used to answer the research questions while t-test was used to test the hypotheses at a 0.05 level of significance.

3. Presentation of Results

3.1. Research Question 1: What are the types of Fruits consumed among retirees from Tertiary Institutions in Delta State, Nigeria?

Table 1 Mean and Standard Deviation on the types of Fruits consumed among retirees from Tertiary Institutions in Delta State, Nigeria

Variables	Items	N	Mean	SD	Decision
Fruits	Grape	446	3.09	1.01	Agreed
	Banana	446	2.68	1.20	Agreed
	Pineapple	446	2.88	1.13	Agreed
	Pawpaw	446	2.80	1.12	Agreed
	Oranges	446	2.95	1.14	Agreed
	Mango	446	2.23	1.15	Disagreed
	Sour sop	446	2.18	1.23	Disagreed
	Guava	446	2.47	1.19	Disagreed
	Water melon	446	3.51	0.67	Agreed
	Pear	446	3.00	1.15	Agreed
	Cashew	446	2.48	1.17	Disagreed
	Apple	446	2.87	1.03	Agreed

Source: Field Work (2025)

Table 1 presents the mean and standard deviation of the types of fruits, consumed among retirees from tertiary institutions in Delta State. The results showed that watermelon was the most consumed type of fruit, with the highest mean score ($M = 3.51$, $SD = 0.67$), while soursop had one of the lowest mean scores ($M = 2.18$, $SD = 1.23$). Furthermore, the result also showed that respondents consumed grape, banana, pineapple, pawpaw, oranges, and apple with mean score ratings above 2.50, while mango, Sour Sop, guava, and cashew were not considered the type of fruits consumed by the respondents, with mean scores below 2.50. The findings indicate that the type of fruits consumed by retirees includes watermelon, orange, banana. The standard deviation of all the items ranged from 0.54 to 1.23, showing that retirees were close in their responses on the types of fruits consumed. The table also showed a grand mean of 2.76.

3.2. Research Question 2: What is the consumption pattern of Fruits among retirees from tertiary institutions in Delta State?

Table 2 Frequency count and percentage on the consumption pattern of fruits among retirees from tertiary institutions in Delta State

Variables	Items	Daily	Often	Occasionally	Rarely	Never
Fruits	Grape	1(2.0%)	46(10.3%)	256 (57.4)	123(27.6)	20(4.5%)
	Banana	65(14.6%)	214(48%)	147(33.0%)	17(3.8%)	3(7.0%)
	Orange	78(17.5%)	221(49.6%)	118(26.5%)	15(3.4%)	14(3.1%)
	Water melon	86(19.3%)	214(48.0%)	108(24.4%)	25(5.6%)	13(2.9%)
	Guava	11(2.5%)	66(14.8%)	176(39.5%)	137(30.7%)	56(12.6%)
	Apple	21(4.7%)	156(35.0%)	136(30.5%)	112(25.1%)	21(4.7%)
	Mango	16(3.6%)	63(14.1%)	207(46.4%)	148(33.2%)	12(4.7%)
	Pawpaw	48(18.0%)	131(29.4%)	205(46.0%)	48(10.8%)	14(3.1%)

Pineapple	49(11.0%)	171(38.3%)	158(35.4%)	44(9.9%)	24(5.4%)
Pear	48(10.8%)	110(24.7%)	186(41.7%)	72(16.1%)	30(6.7%)
Cashew	23(5.2%)	49(11.0%)	126(28.3%)	174(39.0%)	74(16.6%)
Sour sop	21(4.7%)	65(14.6%)	114(25.6%)	195(43.7%)	51(11.4%)
Tomatoes	100(22.4%)	125(28.0%)	96(21.5%)	88(19.7%)	51(11.4%)
Lemon	18(4.0%)	79(17.7%)	160(35.9%)	146(32.7%)	43(9.6%)
Berries	12(2.7%)	52(11.7%)	122(27.4%)	165(37.0%)	95(21.3%)
	Before meal		After Meal		
When do retirees consume these fruits?	196(43.9%)		250(56.1%)		

Source: Field Work (2025)

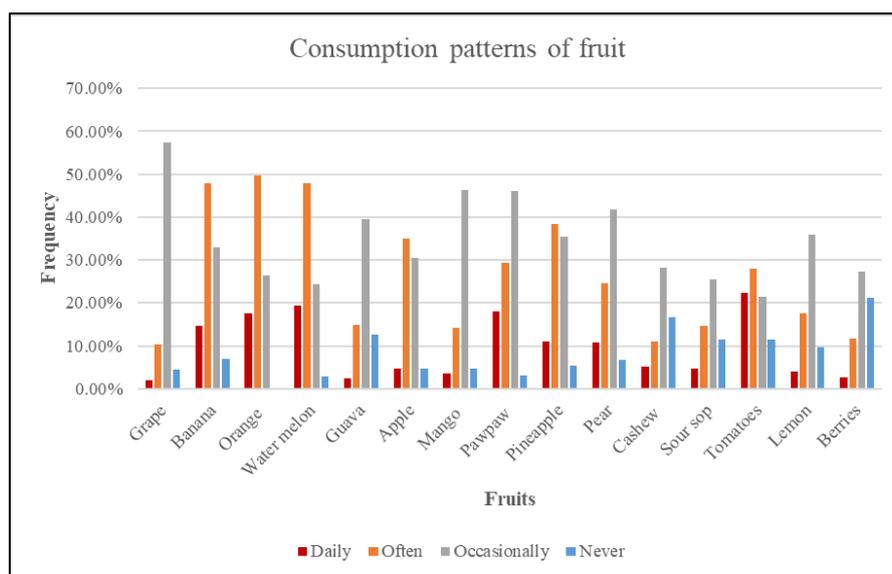


Figure 1 Bar chart showing the consumption patterns of fruits among retirees in Delta State (Field Work, 2025)

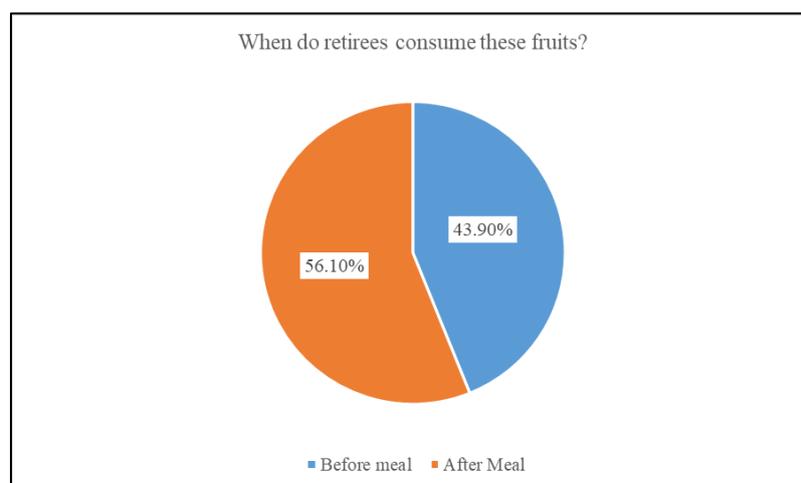


Figure 2 Pie chart showing the time of fruit consumption by the retirees in Delta State (Field Work, 2025)

Table 2 presents the percentage responses of consumption patterns of fruits, among retirees from tertiary institutions in Delta State. Results showed that tomatoes had the highest daily consumption patterns with 22.4%, watermelon,

orange, and banana had 19.3%, 17.5%, and 14.6% respectively. Specifically, Grape was occasionally consumed by 57.4% of the retirees, while bananas were most often consumed by 48.0%. Orange and watermelon had the highest intake in the often category, with 49.6% and 48.0% of respondents, respectively, indicating frequent consumption. Guava was occasionally consumed by 39.5% of retirees, while apple had its highest proportion in the often category at 35.0%. Mango was mostly taken occasionally by 46.4% of respondents. Pawpaw was primarily consumed occasionally by 46.0%, while pineapple was often consumed by 38.3%. Pear was mostly taken occasionally by 41.7%, and cashew had its highest frequency in the rarely category at 39.0%. Sour Sop was rarely consumed by 43.7% of the retirees. Lemon was occasionally consumed by 35.9%, while berries were rarely consumed by 37.0% of retirees. Additionally, 56.1% of retirees reported consuming fruits after meals.

3.3. Research Question 3: What are the perceived health benefits of consuming Fruits by retirees from tertiary institutions in Delta State, Nigeria?

Table 3 Mean responses on the perceived health benefits of consuming Fruits by retirees from tertiary institutions in Delta State, Nigeria

S/N	ITEMS	N	Mean	SD	Decision
1	Decreases the risk of chronic diseases	446	3.60	0.64	Agreed
2	Slows down ageing	446	3.39	0.72	Agreed
3	A good way to treat chronic disease	446	3.26	0.79	Agreed
4	Control blood sugar	446	3.45	0.74	Agreed
5	Prevent constipation	446	3.52	0.72	Agreed
6	Maintain my body weight	446	3.43	0.69	Agreed
7	Relieve pain in my bones	446	3.20	0.76	Agreed
8	Improves my vision	446	3.56	0.63	Agreed
9	Boost my immune system	446	3.61	0.59	Agreed
10	Promote longevity	446	3.37	0.69	Agreed
11	Stimulates my appetite	446	3.48	0.64	Agreed
12	Speed up healing from injuries	446	3.46	0.72	Agreed
13	Increase my cognitive function	446	3.35	0.72	Agreed
	Grand Mean		3.44	0.69	

Source: Field Work (2025)

Criterion Mean = 2.50

Table 3 shows the mean responses on the perceived health benefits of consuming fruits by retirees from tertiary institutions in Delta State. Across all items, the mean scores exceeded the criterion mean of 2.50, indicating a good perception. The respondents agreed that fruits decrease the risk of chronic diseases (3.60), slows down aging (3.39), a good way for treating chronic disease (3.26), control blood sugar (3.45), prevent constipation (3.52), maintain body weight (3.43), relieve pains on bones (3.20), improves vision (3.56), boost immune system (3.61), promote longevity (3.37), stimulates appetite (3.48), speed up healing from injuries (3.46) and increase cognitive function (3.35). The table also shows a grand mean of 3.44. This indicates that retirees in Delta State generally perceive fruits, vegetables, and spices as highly beneficial to health. The standard deviation of all the items ranged from 0.59 to 0.79, showing that retirees were consistent and close in their responses on the perceived health benefits of consuming fruits.

3.4. Hypothesis 1: There is no significant difference between the mean responses of male and female retirees regarding the types of fruits consumed among retirees from tertiary institutions in Delta state

Table 4 t-test Analysis on the difference in the mean responses of male and female retirees on the types of fruits consumed

Variables	Location	N	Mean	S.D	Mean diff.	df	t	p	Remark
Fruits	Male	200	33.62	4.34	0.88	444	1.927	0.055	Not significant
	Female	246	32.74	5.14					

N = Frequency df = degree of freedom t = test statistic p = p-value

Table 4 presents the results of independent samples t-tests comparing the mean consumption scores of fruits between male and female retirees from tertiary institutions in Delta State. Males had a higher mean score of fruit consumption than females, but the difference was not statistically significant (t = 1.927, p = 0.055).

3.5. Hypothesis 2: There is no significant difference between the mean responses of urban and rural retirees regarding the consumption pattern of fruits.

Table 5 t-test analysis on the difference in the mean responses of urban and rural retirees on the consumption pattern of fruits

Variables	Location	N	Mean	S. D	Mean diff.	df	t	p	Remark
Fruits	Urban	196	47.37	7.89	2.49	444	3.260	0.001	Significant
	Rural	250	44.88	8.15					

N = Frequency df = degree of freedom t = test statistic p = p-value

Table 5 shows the result of an independent samples t-test, which was used to compare the mean responses between urban and rural areas regarding the consumption pattern of fruits among retirees from tertiary institutions in Delta State. The mean consumption of fruits among urban (47.37) and rural (44.88) retirees was found to be statistically significant at p=0.001. Indicating that there is a significant difference in fruits consumption between urban and rural retirees.

3.6. Hypothesis 3: There is no significant difference between the mean responses of junior and senior retirees regarding the perceived health benefits of fruits.

Table 6 t-test analysis on the difference in the mean responses between junior and senior staff regarding the perceived health benefits of fruits among retirees from tertiary institutions in Delta State

Status at Retirement	N	Mean	S. D	Mean diff.	df	t	p	Remark
Senior	296	45.46	5.33	2.29	444	4.044	0.000	Significant
Junior	150	43.17	6.22					

a = 0.05

Table 6 shows the mean responses between junior and senior staff regarding the perceived health benefits of fruits among retirees from tertiary institutions in Delta State. Senior staff at retirement have a mean score of 45.46 with a standard deviation of 5.33, and junior staff at retirement have a mean score of 43.17 with a standard deviation of 6.22 and a mean difference of 2.29. The table also shows a t-value of 4.044 and a p-value of 0.000 testing at an alpha level of 0.05 the p-value is less than the alpha level, so the null hypothesis which state that there is no significant difference in the mean responses between junior and senior staff regarding the perceived health benefits of fruits among retirees from tertiary institutions in Delta State is rejected and the conclusion is that there is a significant difference in the mean responses between junior and senior staff regarding the perceived health benefits of fruits among retirees from tertiary institutions in Delta State.

4. Discussion of Findings

4.1. Types of Fruits Consumed Among Retirees from Tertiary Institutions in Delta State, Nigeria

The finding showed that retirees from tertiary institutions in Delta State consume a variety of fruits, with a preference for watermelon, orange, banana, onion, bitter leaf, waterleaf, garlic, and ginger. Traditional fruits like soursop, guava, and cashew. The types of fruits consumed align with the findings of Gianfredi et al (2025) that the ageing population is increasingly concerned about maintaining good health, and as a result, chooses fruits that offer essential nutrients. A corresponding hypothesis revealed that though males had a higher mean score of fruit consumption patterns than females, the difference was not statistically significant. Additionally, females reported a higher mean than males in the types of fruits; however, this difference was also not statistically significant. This finding suggests that gender does not play a major role in determining the types of fruits consumed by retirees. This contradicts the findings of Kpodo et al (2015) that male students indicated a statistically significantly higher preference for some fruits and vegetables than their female counterparts. This contradiction might be explained by differences in study populations. Younger populations may have more gender-related differences in food choices, whereas older adults at the retirement stage may adopt similar dietary habits shaped more by health concerns, availability, and personal preferences than by gender-based differences.

4.2. Consumption Pattern of Fruits among Retirees from Tertiary Institutions in Delta State, Nigeria

The findings showed that retirees from tertiary institutions in Delta State frequently consume fruits such as tomatoes, watermelon, oranges, and bananas, while fruits like soursop and berries were rarely consumed by retirees in Delta State. These findings are corroborated by Olatona et al (2018), who reported that fruits such as apples, oranges, and watermelon are among the most consumed in Nigerian households due to affordability, seasonal availability, and taste. This is also supported by the findings of Onigbinde and Obanewa (2025), who reported frequent consumption of fruits like orange, watermelon, and apple among students in Nigeria. This pattern reflects a preference for more familiar, readily available, and affordable fruit options. Tomatoes and watermelon, in particular, are not only easily accessible but also commonly integrated into both meals and snacks, making them convenient choices for daily consumption. Oranges and bananas are also staple fruits in many Nigerian households and are valued for their refreshing taste, high vitamin content, and minimal preparation requirements.

A corresponding hypothesis highlights the influence of geographical location on retirees' consumption patterns in Delta State, with urban retirees reporting significantly higher intake of fruits. This may be explained by better access to food markets, wider availability of local and imported produce, improved storage facilities, and greater exposure to nutrition education in urban centres. This finding contradicts the study of Ygnatios et al. (2023) in Brazil, which reported that rural residents consumed fruits less frequently than their urban counterparts. The disparity between this study and the findings may be attributed to contextual differences across countries.

The finding that more than half of the retirees consume fruits after meals reflects a culturally influenced dietary habit, possibly shaped by taste preferences or traditional mealtime patterns. While this practice may contribute to improved digestion and provide post-meal hydration and fibre, it does not align with some evidence-based recommendations on meal sequencing. For instance, Abdul Hakim et al. (2019) reported that consuming fruits before meals significantly increased satiety, reduced total energy intake, and positively influenced appetite-regulating hormones. This suggests that the common practice of consuming fruits after meals among retirees, although beneficial, may not maximise the metabolic and appetite-control benefits documented in the literature.

4.3. Perceived Health Benefits of Consuming Fruits by Retirees from Tertiary Institutions in Delta State, Nigeria

The finding reveals that retirees from tertiary institutions in Delta State hold a positive perception of the health benefits of fruits. The consistently high mean scores across all assessed items indicate a widespread belief that these foods contribute to overall well-being and help prevent or manage age-related conditions such as hypertension, diabetes, and cardiovascular disease. Respondents particularly associated their consumption with decreasing the risk of chronic diseases, boosting immunity, improving vision, and preventing constipation. These perceptions align with Bruns et al. (2024), who linked plant-based diets with reduced incidence of non-communicable diseases, and with Akinyemi et al. (2021), who observed that older adults often prioritise foods they believe can alleviate existing health concerns. This suggests that retirees' positive perceptions are shaped largely by personal health experiences and the increased vulnerability to chronic illnesses that accompany ageing.

A corresponding hypothesis revealed a statistically significant difference in the perceived health benefits of fruits between junior and senior staff retirees from tertiary institutions in Delta State. This indicates that staff category during

active service influences how retirees view the role of these foods in promoting health and preventing disease in old age. Senior staff, who generally possess higher educational qualifications and hold more administrative roles, likely had greater access to wellness programmes, healthcare services, and nutrition-related campaigns, shaping a more positive perception of dietary choices. In contrast, junior staff, often with fewer opportunities for structured health education and lower socioeconomic standing, displayed less favourable perceptions. Similar patterns have been reported by Akinyemi et al. (2021), who observed that nutrition perceptions in older adults are closely linked to education and socioeconomic background, and by Olatona et al. (2018), who found that higher education enhances understanding of the benefits of fruit and vegetable consumption.

5. Conclusion

Based on the findings of the study, it was concluded that grape, pineapple, watermelon, oranges, bananas, pawpaw, pear and apple were the most types of fruits consumed by retirees, no significant difference exist between male and female retirees on the types of fruits consumed. On the consumption pattern, the study showed a significant difference between urban and rural retirees and on health benefit a significant difference exist between senior and junior retirees.

Recommendations

Based on the above finding, the researcher recommended the following:

- Awareness campaign should be carried out on consumption patterns of fruits in the rural areas to enhance better consumption pattern.
- Government should regulate the price of fruits to enable junior staff retirees purchase the required fruits needed.

Compliance with ethical standards

Disclosure of conflict of interest

No conflict of interest to be disclosed.

References

- [1] Ferreira RC, Barbosa LB, Vasconcelos SML. Studies assessing food consumption by the score method: a systematic review. *Cien Saude Colet.* 2019;24(5):1777-1792. doi:10.1590/1413-81232018245.12362017.
- [2] World Health Organization. Ageing and health [Internet]. Geneva: World Health Organization; 2025 [cited 2026 Feb 14]. Available from: <https://www.who.int/news-room/fact-sheets/detail/ageing-and-health>
- [3] United Nations Department of Economic and Social Affairs, Population Division. World Population Prospects 2019: Highlights [Internet]. New York: United Nations; 2019 [cited 2026 Feb 14]. Available from: <https://population.un.org/wpp/>
- [4] Stenholm S, Vahtera J. Does retirement benefit health? *Prev Med.* 2017;100:294-295. doi:10.1016/j.ypmed.2017.05.007.
- [5] Norman K, Haß U, Pirlich M. Malnutrition in older adults—recent advances and remaining challenges. *Nutrients.* 2021;13(8):2764. doi:10.3390/nu13082764.
- [6] Schulze MB, Martínez-González MA, Fung TT, Lichtenstein AH, Forouhi NG. Food-based dietary patterns and chronic disease prevention. *BMJ.* 2018;361:k2396. doi:10.1136/bmj.k2396.
- [7] Food and Agriculture Organization of the United Nations. Report on Functional Foods. Rome: FAO; 2019. Available from: http://www.fao.org/ag/agn/agns/files/Functional_Foods_Report_Nov2019.pdf
- [8] Essa MM, Bishir M, Bhat A, et al. Functional foods and their impact on health. *J Food Sci Technol.* 2023;60(3):820-834. doi:10.1007/s13197-021-05193-3.
- [9] Obayelu AE, Ogunnaike MG, Omotoso FK. Socio-economic determinants of fruits consumption among students of the Federal University of Agriculture, Abeokuta, Ogun State, Nigeria. *Int J Fruit Sci.* 2018;19(2):211-220.
- [10] Slavin JL, Lloyd B. Health benefits of fruits and vegetables. *Adv Nutr.* 2012;3(4):506-516. doi:10.3945/an.112.002154.

- [11] Yashin A, Yashin Y, Xia X, Nemzer B. Antioxidant activity of spices and their impact on human health: a review. *Antioxidants (Basel)*. 2017;6(3):70. doi:10.3390/antiox6030070.
- [12] Gottardi D, Bukvicki D, Prasad S, Tyagi AK. Beneficial effects of spices in food preservation and safety. *Front Microbiol*. 2016;7:1394. doi:10.3389/fmicb.2016.01394.
- [13] Ozkur M, Benlier N, Takan I, et al. Ginger for healthy ageing: a systematic review on current evidence of its antioxidant, anti-inflammatory, and anticancer properties. *Oxid Med Cell Longev*. 2022;2022:4748447. doi:10.1155/2022/4748447.
- [14] Celidoni M, Dai Bianco C, Rebba V, Weber G. Retirement and healthy eating. 2020. doi:10.1111/1475-5890.12196.
- [15] Seidu AA, Aboagye RG, Frimpong JB, et al. Determinants of fruits and vegetables consumption among in-school adolescents in Ghana. *Adolescents*. 2021;1(2):199-211. doi:10.3390/adolescents1020016.
- [16] Silva OO, Ayankogbe OO, Odugbemi T. Knowledge and consumption of fruits and vegetables among secondary school students of Obele Community Junior High School, Surulere, Lagos State, Nigeria. *J Clin Sci*. 2017;14(2):68-73. doi:10.4103/jcls.jcls_60_16.
- [17] Olatona FA, Sosanya A, Sholeye OO, et al. Knowledge of fruits and vegetables, consumption patterns, and associated factors among adults in Lagos State, Nigeria. *Res J Health Sci*. 2023;6(2):50-62. Available from: <https://rjhs.org/index.php/home/article/view/174>
- [18] Gianfredi V, Nucci D, Pennisi F, et al. Aging, longevity, and healthy aging: the public health approach. *Aging Clin Exp Res*. 2025;37(1):125. doi:10.1007/s40520-025-03021-8.
- [19] Kpodo FM, Mensah C, Dzah CS. Fruit and vegetable consumption patterns and preferences of students in a Ghanaian polytechnic. *World J Nutr Health*. 2015;3(3):53-59. Available from: <https://pubs.sciepub.com/jnh/3/3/2>
- [20] Onigbinde AO, Obanewa EK. Fruits and vegetables consumption pattern among female undergraduate students of a Nigerian university. *Int J Acad Appl Res*. 2025;9(5):116-122.
- [21] Ygnatios NTM, Moreira BS, Lima-Costa MF, Torres JL. Urban-rural differences in food consumption and environment and anthropometric parameters of older adults: results from ELSI-Brazil. *Cad Saude Publica*. 2023;39(7):e00179222. doi:10.1590/0102-311XPT179222.
- [22] Abdul Hakim BN, Yahya HM, Shahar S, et al. Effect of sequence of fruit intake in a meal on satiety. *Int J Environ Res Public Health*. 2019;16(22):4464. doi:10.3390/ijerph16224464.
- [23] Bruns A, Greupner T, Nebl J, Hahn A. Plant-based diets and cardiovascular risk factors: a comparison of flexitarians, vegans and omnivores in a cross-sectional study. *BMC Nutr*. 2024;10(1):29. doi:10.1186/s40795-024-00839-9.
- [24] Akinyemi OR, Adepoju OT, Osundahunsi OF. Dietary habits and nutrition knowledge among elderly Nigerians: implications for health and well-being. *J Nutr Health Sci*. 2021;8(2):45-56.