



Food Consumption Patterns and Dietary Variety among Senior Civil Servants in Umuahia North Local Government Area, Abia State, Nigeria

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ABSTRACT

Background: Food consumption patterns and the variety of foods consumed are important dimensions of nutritional well-being. Changing lifestyles, urbanization and increased reliance on convenience foods have contributed to rising diet-related non-communicable diseases. This study assessed food consumption patterns and dietary variety among senior civil servants in Umuahia North Local Government Area, Abia State, Nigeria.

Methods: A cross-sectional descriptive analysis was conducted among 222 senior civil servants selected through multistage sampling from ministries and government establishments. Data were collected using a structured, interviewer-administered questionnaire developed for the parent study and subjected to expert review and pretesting. Food-frequency data were analysed descriptively. Dietary variety was described from the range of food groups and food items reported in the food-frequency questionnaire; a validated dietary diversity score, recall-period score or diversity cutoff was not calculated.

Results: Respondents consumed foods from several food groups, but frequency varied substantially across items. For example, gari was consumed daily by 55.9% of respondents, beans three times a week by 37.8%, and oranges weekly by 31.5%. Milk products were generally infrequently consumed, while sugar and sweetened beverages were also present in the diet. These findings describe food-frequency patterns and food-group variety rather than a standardized dietary diversity score.

Conclusion: Respondents reported consumption from multiple food groups, but the frequency of nutrient-dense and energy-dense foods varied. Nutrition education and workplace-based interventions are recommended to promote healthier food choices. Because no validated dietary diversity score was calculated, the findings should be interpreted as descriptive evidence of dietary variety and food-consumption patterns.

Keywords: Food consumption pattern; Dietary variety; Civil servants; Nutrition; Food frequency; Nigeria; Public health nutrition.

INTRODUCTION

Diet plays a critical role in human health and well-being, influencing growth, development, productivity, and the prevention of disease throughout the life course. Adequate nutrition is achieved not only through sufficient food intake but also through the consumption of diverse foods that provide essential macro- and micronutrients required for optimal physiological functioning. Dietary diversity is widely recognized as a key indicator of diet quality and nutrient adequacy, particularly among adults and working populations (FAO, 2021; WHO, 2023). Studies have consistently shown that individuals consuming a wider variety of food groups are more likely to meet their nutritional requirements and experience better health outcomes than those with monotonous diets (Ruel, 2003; Caswell *et al.*, 2021). Globally, dietary patterns have undergone significant transformations over the last few decades due to rapid urbanization, economic growth, globalization of food systems, and changing lifestyles. These transitions have led to increased consumption of processed foods, refined carbohydrates,



sugar-sweetened beverages, and foods high in saturated fats, while the intake of fruits, vegetables, legumes, and whole grains has declined in many populations (Popkin *et al.*, 2020; GBD Diet Collaborators, 2022). Such dietary changes have contributed substantially to the rising burden of non-communicable diseases (NCDs), including obesity, cardiovascular diseases, hypertension, type 2 diabetes mellitus, and certain cancers, which collectively account for a significant proportion of global morbidity and mortality (WHO, 2023). The concept of dietary diversity has gained increasing attention in public health nutrition because it serves as a practical proxy measure for assessing nutrient adequacy and overall diet quality. According to the Food and Agriculture Organization, dietary diversity reflects household and individual access to a broad range of foods and is closely associated with nutritional status and health outcomes (FAO, 2021). Previous studies have demonstrated positive relationships between dietary diversity and improved micronutrient intake, better nutritional status, enhanced immune function, and reduced risk of chronic diseases (Arimond *et al.*, 2019; Fung *et al.*, 2022). Conversely, poor dietary diversity has been associated with nutrient deficiencies, compromised health, and increased vulnerability to both infectious and chronic diseases.

Nigeria, like many low- and middle-income countries, is currently experiencing a nutrition transition characterized by changing food consumption patterns and increasing prevalence of diet-related diseases. Traditional diets rich in legumes, vegetables, roots, tubers, and minimally processed foods are increasingly being replaced by energy-dense diets containing refined grains, processed snacks, sugary beverages, and fast foods (Sloan, 2005). These dietary shifts have contributed to the growing burden of overweight, obesity, hypertension, and cardiovascular diseases observed among Nigerian adults. Recent national and regional studies have reported suboptimal consumption of fruits and vegetables alongside increased intake of processed foods among urban populations (National Bureau of Statistics and UNICEF, 2022; Lipoeto *et al.*, 2012). Occupational factors are known to influence food choices and dietary behaviors. Civil servants represent an important workforce population whose dietary practices may be affected by work schedules, sedentary job characteristics, workplace environments, socioeconomic status, and time constraints. Long hours of desk-based work often encourage meal skipping, frequent snacking, consumption of convenience foods, and eating outside the home, all of which may adversely affect dietary quality (Adeoye *et al.*, 2021). Senior civil servants, in particular, may have greater purchasing power and access to a wider variety of foods, but this does not necessarily translate into healthier dietary choices. Evidence from several Nigerian studies suggests that employed adults frequently exhibit inadequate dietary practices despite relatively stable incomes. For example, studies among public-sector workers and urban professionals have reported insufficient consumption of fruits, vegetables, and dairy products, coupled with high consumption of refined carbohydrates and fried foods (Afolabi *et al.*, 2020; Eze *et al.*, 2022). Such dietary patterns have been linked to increased risks of obesity, dyslipidaemia, hypertension, and cardiovascular diseases. Similar findings have been reported in other African countries, where workplace dietary behaviors have emerged as important determinants of adult health outcomes.

Food consumption patterns are influenced by multiple factors, including income level, food availability, cultural beliefs, nutrition knowledge, household composition, and personal preferences. Understanding these patterns among specific occupational groups is essential for designing targeted nutrition interventions and workplace health promotion programmes. Standardized dietary diversity indicators can provide useful information on food-group variety and nutrient adequacy when they are based on a defined recall period, food-group classification, scoring procedure and interpretation threshold (FAO, 2021). The present manuscript was derived from a broader investigation on cholesterol profile and feeding practices among senior civil servants in Umuahia North Local Government Area of Abia State, Nigeria. The parent study documented feeding practices, food consumption patterns, anthropometric characteristics and lipid profiles. Because the parent food-frequency questionnaire was not designed to generate a validated dietary diversity score, this manuscript distinguishes food-frequency findings from a descriptive assessment of dietary variety across food groups. Accordingly, no dietary diversity score or adequacy cutoff is reported. The study therefore assessed food consumption patterns and dietary variety among senior civil servants in Umuahia North LGA, with the aim of informing workplace nutrition interventions and healthier dietary practices.



METHODS

Study Area

The study was conducted in Umuahia North Local Government Area (LGA) of Abia State, Nigeria. Umuahia North serves as the administrative headquarters of Abia State and hosts numerous government ministries, departments, and agencies. The LGA is predominantly urban, with a population engaged in civil service, commerce, education, and other economic activities. The urban nature of the area provides access to a wide variety of foods through local markets, supermarkets, restaurants, fast-food outlets, and street vendors, thereby influencing food consumption patterns and dietary behaviors among residents.

Study Design

This manuscript presents a cross-sectional descriptive analysis of the food-consumption component of a broader study of cholesterol profile and feeding practices among senior civil servants in Umuahia North Local Government Area, Abia State.

Study Population

The study population comprised senior civil servants employed in selected ministries, departments and government establishments in Umuahia North LGA. Eligible participants were officers in the senior cadre who were actively employed during the study period, available for data collection and willing to provide informed consent.

Sample Size and Sampling Technique

A total of 222 senior civil servants with completed questionnaires were included. Multistage sampling was used. First, government ministries and establishments within Umuahia North LGA were identified and selected. Second, the number of participants recruited from each selected establishment was allocated proportionately. Eligible senior civil servants within the selected establishments were then approached and consenting participants were enrolled. The retained parent-study records available for this analysis did not include the total number of eligible staff approached; therefore, a response rate could not be calculated.

Data Collection Instrument

Data were collected using a structured, interviewer-administered questionnaire developed specifically for the parent study. The instrument covered socio-demographic characteristics, feeding practices, food consumption, anthropometric measurements and biochemical characteristics. The present analysis used the food-consumption component, which recorded how often respondents consumed commonly eaten foods across major food groups. The food-frequency component was not adapted as a scored dietary diversity instrument.

Assessment of Food Consumption Patterns

Food consumption patterns were assessed using a semi-quantitative Food Frequency Questionnaire (FFQ). Respondents were asked to indicate how frequently they consumed selected food items within major food groups, including:

- Cereals and cereal products;
- Green leafy and non-leafy vegetables;
- Roots and tubers;
- Legumes and legume products;
- Milk and milk products;
- Fats and oils;
- Beverages;
- Fruits;

- Starchy fruits;
- Meat and fish products; and
- Foods classified as empty-calorie foods.

The original response categories were daily, three times a week, weekly, monthly, rarely and no response, depending on the food item/table. Food-frequency results were analysed and presented as frequencies and percentages for individual food items. These frequency categories describe habitual consumption patterns and were not converted into a dietary diversity score.

Assessment of Dietary Variety

Dietary variety was assessed descriptively from the range of food groups and food items represented in the food-frequency questionnaire. Foods were considered within broad categories including cereals, roots and tubers, vegetables, fruits, legumes, dairy products, animal-source foods, fats and oils, and beverages. This approach was informed conceptually by FAO guidance on food-group diversity, but the parent questionnaire did not use a specified 24-hour recall period, a validated food-group scoring algorithm or predefined cutoff points. Therefore, no formal dietary diversity score, mean/median diversity score or proportion meeting a diversity threshold was calculated. Food-frequency findings and descriptive food-group variety are reported as distinct outcomes and should not be interpreted as interchangeable measures.

Quality Control

The questionnaire underwent face and content review by specialists in Human Nutrition and Dietetics and was pretested among individuals with characteristics similar to the study population who were not included in the final sample. Feedback from the pretest was used to improve wording, clarity, comprehensiveness and consistency, and research assistants were trained on interview procedures and questionnaire administration. A formal reliability coefficient or test-retest statistic for the food-frequency component was not available in the retained parent-study documentation.

Data Management and Statistical Analysis

Completed questionnaires were checked for completeness and consistency before data entry. Data were coded and analysed using the Statistical Package for Social Sciences (SPSS) version 20.0. Descriptive statistics, including frequencies and percentages, were used to summarize food-consumption patterns. Food-frequency distributions were generated for individual foods within each food group. No inferential comparison or standardized dietary diversity score was calculated for the present manuscript; statistical significance was therefore not used to interpret the food-frequency findings.

Ethical Considerations

Ethical approval for the parent study was obtained from the appropriate institutional authorities before commencement of data collection. Permission to conduct the study was obtained from relevant government establishments included in the study. Participation was voluntary, and written informed consent was obtained from all respondents before enrolment. Respondents were assured of confidentiality and anonymity, and all information obtained was used strictly for research purposes. Participants were informed of their right to decline participation or withdraw from the study at any stage without penalty.

RESULTS AND DISCUSSION

Table 1 presents the consumption pattern of roots and tubers among the respondents.

Table 1: Consumption of roots and tubers (N = 222)

Root and Tuber	No response	Daily	3 X a week	Weekly	Monthly	Rarely
Gari	37(16.7)	124(55.9)	22(9.9)	9(4.1)		30(13.5)



Fufu	77 (34.7)	52(23.4)	7(3.2)	9(4.1)	11(5.0)	66(29.7)
Abacha	42(18.9)	3(1.4)	2(0.9)	27(12.2)	29(13.2)	119(53.6)
Yam	41(18.5)	24(10.8)	76(34.2)	47(21.2)	24(10.8)	10(4.5)
Sweet potato	51(23.0)	4(1.8)	16(7.2)	56(25.2)	26(11.7)	69(31.1)
Irish potato	44(19.8)	2(0.9)	7(3.2)	8(3.6)	17(7.7)	114(64.6)
Cocoyam	46(20.7)	4(1.8)	5(2.3)	19(8.6)	16(7.2)	132(59.5)
Three leaf yams	50(22.5)		3(1.4)	3(1.4)	9(4.1)	157(70.7)
Water yam	58(26.1)	4(1.8)	3(1.4)	12(5.4)	7(3.2)	136(61.3)

Source: Household survey,

Figures in parentheses are the percentage values

Table 2 presents the consumption pattern of legumes and legume products among the respondents.

Table 2: Consumption of legumes and its products by the respondents (N = 222)

Legume crop	No response	Daily	3 x a week	Weekly	Monthly	Rarely
Beans	7(3.2)	53(23.8)	84(37.8)	49(22.1)	15(6.58)	14(6.3)
Akara	21(9.5)	2(0.9)	8(3.6)	96(43.2)	33(14.9)	62(27.9)
Moi-moi	21(9.5)	5(2.3)	32(14.4)	115(51.8)	32(14.4)	17(7.7)
African yam bean	36(16.2)		3(1.4)	40(18.0)	35(15.8)	108(48.7)
Soybean	81(36.8)		10(4.5)	13(5.9)	5(2.3)	113(50.5)
Groundnut	18(8.1)	15(6.8)	52(23.4)	88(39.6)	17(7.7)	32(14.4)
Okra	33(14.9)	8(3.6)	29(13.1)	64(28.8)	26(11.7)	62(27.9)
Ugba	21(9.5)	8(3.6)	5(2.3)	18(8.1)	46(20.7)	124(55.8)
Breadfruit (Ukwa)	22(9.9)	2(0.9)	8(3.6)	12(5.4)	48(21.6)	130(58.6)
Egusi (Melon)	28(12.6)	5(2.3)	61(27.5)	69(31.1)	42(18.9)	17(7.7)

Source: Household survey,

Figures in parentheses are the percentage values

Table 3 presents the consumption pattern of milk and milk products among the respondents.

Table 3: Consumption of milk products (N = 222)

Responses	Frequency	Percentage
Ice cream		
No response	88	39.6
Daily	5	2.3
3 x a week	2	0.9
Weekly	12	5.4
Monthly	7	3.2
Rarely	108	48.6
Cheese		
No response	83	37.4
Daily	2	0.9
3 x a week	4	1.8
Weekly	10	4.5
Monthly	2	.9
Rarely	121	54.50
Yoghurt		
No response	57	25.7



Daily	2	0.9
Weekly	18	8.2
Monthly	34	15.3
Rarely	109	49.1

Source: Household survey, (2014)

Table 4 presents the consumption pattern of fats and oils among the respondents.

Table 4: Consumption of fats and oil (N = 222)

Responses	Frequency	Percentage
Red palm oil		
No response	9	4.1
Daily	156	70.3
3 x a week	31	13.9
Weekly	22	9.9
Monthly	4	1.8
Margarine		
No response	63	28.4
3 x a week	2	0.9
Weekly	12	5.4
Monthly	24	10.8
Rarely	121	54.5
Palm kernel		
No response	65	29.3
Daily	3	1.4
3 x a week	8	3.6
Weekly	5	2.3
Monthly	26	11.7
Rarely	115	51.8

Source: Household survey, (2014)

Table 5 presents the frequency of beverage consumption among the respondents.

Table 5: The number of times beverages are consumed among the Respondents

Responses	No response	Daily	Thrice a week	Weekly	Monthly	Rarely
Malt	43(19.4)	7(3.2)	23(10.4)	70(31.6)	19(8.6)	62(27.9)
Cola drink	68(30.6)	7(3.2)	9(4.1)	46(19.8)	16(7.2)	78(35.1)
Coconut drink	99(44.6)	3(1.4)		10(4.5)	3(1.4)	109(48.2)
Bournvita	68(30.6)	17(7.7)	22(9.9)	57(24.8)	9(4.1)	51(22.9)
Lipton	57(25.7)	26(11.7)	23(10.4)	45(20.3)	15(6.8)	56(25.5)
Ovaltine	93(41.9)	7(3.2)	9(4.1)	30(13.5)	5(2.3)	78(35.1)

Source: Household survey,

Figures in parentheses are the percentage values

Table 6 presents the consumption pattern of empty-calorie foods among the respondents.

Table 6: Consumption of empty calories by the respondents (N = 222)

Responses	Frequency	Percent
Sugar		
No response	54	24.3

Daily	44	19.8
3 x a week	33	14.9
Weekly	20	9.0
Monthly	4	1.8
Rarely	67	30.2
Sweets		
No response	43	19.4
Daily	11	4.9
3 x a week	7	3.2
Weekly	16	7.2
Monthly	9	4.1
Rarely	136	61.3

Source: Household survey, (2014)

Table 7 presents the frequency of fruit and starchy-fruit consumption among the respondents.

Table 7: Number of times fruits are consumed among the Respondents

Responses	No responses	Daily	Thrice a week	Weekly	Monthly	Rarely
Orange	27(12.2)	14(6.3)	32(14.4)	70(31.5)	24(10.8)	55(24.7)
Pineapple	44(19.8)	2(0.9)	18(8.1)	45(20.3)	34(15.3)	79(35.6)
Guava	57(25.7)			15(6.8)	18(8.1)	132(59.5)
Mango	61(27.5)	4(1.8)	23(10.4)	22(9.9)	8(3.6)	104(46.8)
African pear	52(23.4)	2(0.9)	5(2.3)	3(1.4)	50(22.5)	110(49.5)
Avocado	34(15.3)		7(3.2)	15(6.8)	48(21.6)	118(53.2)
Pear (Ube Ugba)	64(28.8)			3(1.4)	17(7.7)	138(62.2)
Cashew	49(22.1)	6(2.7)		6(2.7)	16(7.2)	151(68.0)
Nkwa (Icheku)	66(29.7)	2(0.9)	5(2.3)		17(7.7)	132(59.5)
Apple	27(12.2)	10(4.5)	29(13.1)	82(36.9)	35(15.8)	39(17.6)
Paw Paw	22(9.9)	18(8.1)	25(11.2)	65(29.3)	40(18.0)	52(23.4)
Sour soup	79(35.3)		3(1.4)	9(4.1)	20(9.0)	111(49.5)
Starchy Fruits						
Plantain	25(11.3)	5(2.3)	88(39.6)	59(26.6)	33(14.9)	12(5.4)
Banana	34(15.3)	3(1.4)	29(13.1)	79(35.6)	27(12.2)	50(22.5)

Source: Household survey,

Figures in parentheses are the percentage values

Table 8 presents the consumption pattern of meat and fish among the respondents.

Table 8: Consumption of Meat and Fish (N = 222)

Food items	No response	Daily	Thrice a week	Weekly	Monthly	Rarely
Beef	42(18.9)	109(49.1)	32(14.4)	15(11.3)		14(6.3)
Goat	44(19.8)	9(4.5)	24(10.8)	9(4.5)	42(18.9)	94(42.3)
Pork		72(32.4)	2(0.9)	2(0.9)	20(9.0)	124(55.8)
Frog (Akiri)	109(49.1)					113(50.9)
Crab	112(50.4)	5(2.3)		5(2.3)		100(45.1)
Dry fish	21(9.6)	80(36.0)	76(34.2)	37(16.8)	6(2.7)	2(0.9)
Fresh fish	53(23.9)	17(7.7)	42(18.9)	54(24.3)	32(14.4)	24(10.8)
Frozen fish	42(18.9)	16(7.2)	91(41.0)	29(13.1)	23(10.4)	21(9.5)
Cray fish	21(9.5)	14(6.3)	80(36.0)	55(24.7)	50(22.5)	2(0.9)
Snail	14(6.3)	145(65.3)	50(22.5)	10(4.5)		3(1.4)



Termite	39(17.6)	2(0.9)	7(3.2)	19(8.6)	24(10.8)	131(59.0)
Bush meat	89(40.1)		5(2.3)			128(57.7)
Egg	50(22.5)	2(0.9)	6(2.7)	26(11.7)	12(5.4)	126(56.8)

Source: Household survey, (2014)

Figures in parentheses are the percentage values

Table 9 presents the exercise patterns of the respondents.

Table 9: Exercise pattern of the respondents (N = 222)

	S	T	R	J	BW	MW	CD	SWE	LAN	GAR	LW	COO
No responses	217 (97.7)	209 (94.1)	204 (91.9)	189 (85.1)	145 (65.3)	99 (44.6)	79 (35.8)	165 (74.3)	145 (65.3)	173 (77.9)	118 (53.1)	136 (61.6)
Day	5 (2.3)	10 (4.5)	11 (4.9)	28 (12.6)	61 (27.5)	99 (44.6)	123 (55.4)	37 (16.7)	35 (15.8)	22 (9.9)	98 (44.1)	72 (32.4)
Week	0 (0)	5 (2.3)	4 (1.8)	0 (0)	15 (6.8)	24 (10.8)	19 (8.6)	15 (6.8)	41 (18.5)	22 (9.9)	4 (1.8)	8 (3.6)
Month	0(0)	0	0(0)	5(2.3)	0(0)	0(0)	0(0)	4(1.8)	0(0)	4(1.8)	0(0)	4(1.8)

Source: Household survey, , (2014)

Figures in parentheses are the percentage values

S= Soccer, T-Tennis, R=Running, J=Jogging, BW = Brisk walking; MW = Moderate walking; SW=Sweeping, CD = Car driving; LW = Light walking, Gardening, coo=cooking

Table 10 presents the supplements used by the respondents and the reported reasons for their use.

Table 10: Supplements used by the respondents (N = 222)

Supplements	The heart	Longevity	Against diseases	Doctor's prescription	Habit	Reduces weight
No response	134(60.4)	162(63)	176(79.3)	161(72.5)	156(70.3)	174(78.4)
Vitamin A	20(9.0)	7(3.2)	2(0.9)	7(3.2)	2(1.8)	6(2.7)
Vitamin C	48(21.6)	28(12.6)	31(13.9)	35(15.7)	48(21.6)	37(16.7)
Vitamin E	2(0.9)	4(1.8)	0(0)	4(1.8)	9(4.1)	0(0)
Centrum	9(4.1)	13(5.8)	9(4.1)	4(1.8)	4(1.8)	0(0)
Omega 3	7(3.2))	4(1.8)	4(1.8)	4(1.8)	0(0)	0(0)
Multivite	2(09)	4(1.8)	0(0)	3(1.4)	2(0.9)	0(0)
Fish oil	0(0)	0(0)	0(0)	4(1.8)	0(0)	5(2.3)

Source: Household survey, (2014)

Figures in parentheses are the percentage values

Table 11 presents the body mass index (BMI) distribution of the respondents.

Table 11: Distribution of respondents by BMI (N = 222)

BMI	Distribution	Frequency	Percentage (%)
<18	Underweight	0	0
18.0 – 24.9	Normal	35	15.8



25.0 – 29.9	Overweight	84	37.8
30.0 – 39.9	Obese	92	41.4
40.0 – 49.0	Morbidly obese	11	4.9
Mean = 30.5			

Source: Household survey, (2014)

DISCUSSION

This study assessed the food consumption patterns and dietary variety of senior civil servants in Umuahia North Local Government Area, Abia State, Nigeria. The findings revealed a dietary pattern characterized by frequent consumption of cereals and cereal products, moderate consumption of vegetables, fruits, legumes, and animal-source foods, and varying consumption of processed foods, beverages, and empty-calorie foods. Overall, the respondents reported foods from a relatively broad range of food groups, although some food groups appeared to be consumed more frequently than others. The study found that cereals and cereal products constituted a major component of the respondents' diets, with rice, bread, maize-based products, and noodles being among the most frequently consumed foods. This finding is consistent with the dietary patterns commonly observed in Nigeria and many other sub-Saharan African countries, where cereals serve as the primary source of dietary energy and account for a substantial proportion of daily caloric intake (FAO, 2023). The predominance of cereal-based foods among respondents may be attributed to their affordability, accessibility, convenience, and cultural acceptability. Similar findings have been reported among working-class populations in Nigeria, where rice and bread were identified as staple foods consumed regularly by employed adults (Afolabi *et al.*, 2020). While cereals provide important energy and some essential nutrients, excessive reliance on refined cereal products may contribute to poor dietary quality if not complemented with adequate consumption of fruits, vegetables, legumes, and other nutrient-dense foods.

Vegetable consumption among respondents was relatively encouraging, particularly the frequent consumption of onion, tomato, and fluted pumpkin (*Telfairia occidentalis*). These vegetables are commonly incorporated into traditional Nigerian meals and are recognized sources of vitamins, minerals, dietary fibre, and bioactive compounds with antioxidant properties. The frequent consumption of vegetables observed in this study is comparable to findings from previous studies conducted among urban populations in southeastern Nigeria, where vegetables formed an integral component of daily meals. Increased vegetable consumption has been associated with reduced risk of cardiovascular diseases, hypertension, obesity, and certain cancers due to the protective effects of dietary fibre and phytochemicals (WHO, 2023). Nevertheless, the frequency of vegetable consumption alone may not necessarily translate to adequate intake, as portion sizes and preparation methods also influence nutritional benefits. Fruit consumption was reported across a wide range of fruits including oranges, mangoes, pineapples, guava, avocado pear, pawpaw, apples, bananas, and African pear. The observed range of fruits indicates dietary variety, although it does not constitute a standardized dietary diversity score. Similar findings have been reported among urban Nigerian adults where seasonal fruits contribute substantially to dietary diversity scores. Fruits are important sources of vitamins, minerals, antioxidants, and dietary fibre, and regular consumption has been linked to lower risks of cardiovascular disease, type 2 diabetes, and all-cause mortality (GBD Diet Collaborators, 2022). However, studies have shown that fruit consumption among many Nigerian adults remains below recommended levels despite the availability of local fruits (National Bureau of Statistics and UNICEF, 2022).

Therefore, although respondents in the present study consumed a variety of fruits, there remains a need to promote regular and adequate fruit intake in accordance with international dietary recommendations. The findings also revealed moderate consumption of legumes and legume products among respondents. Legumes are valuable sources of plant protein, dietary fibre, iron, zinc, and other essential nutrients. In Nigeria, foods such as beans, soybean products, and other legumes constitute important components of traditional diets and contribute significantly to household food security. Previous studies have demonstrated that regular consumption of legumes is associated with improved dietary quality and reduced risk of obesity, cardiovascular diseases, and metabolic disorders (Fung *et al.*, 2022; Mohammed *et al.*, 2024). The moderate consumption of legumes observed in this study may therefore contribute positively to nutrient adequacy among respondents. However, greater inclusion of legumes in daily diets may broaden dietary variety and improve



overall nutritional quality. Consumption of milk and milk products varied among respondents, suggesting differences in dietary preferences, affordability, and accessibility. Dairy products are important sources of high-quality protein, calcium, phosphorus, and several micronutrients essential for bone health and metabolic functioning. Similar variability in dairy consumption has been reported among adult populations in Nigeria, where milk intake is often influenced by income level, dietary habits, and nutrition knowledge (Eze et al., 2022). Low consumption of dairy products may predispose individuals to inadequate calcium intake and associated health consequences, particularly among older adults.

Animal-source foods, including meat and fish, were consumed by a substantial proportion of respondents. Animal-source foods provide highly bioavailable protein and essential micronutrients such as iron, zinc, vitamin B12, and omega-3 fatty acids. Fish consumption, in particular, has been associated with improved cardiovascular health and reduced risk of coronary heart disease (WHO, 2023). The observed consumption of meat and fish among respondents may reflect their relatively stable income and purchasing power as senior civil servants. However, excessive intake of processed meats and high-fat animal products may increase the risk of cardiovascular disease and other chronic conditions, highlighting the importance of balanced consumption. An important finding of this study was the consumption of beverages and empty-calorie foods among respondents. Increased consumption of sugar-sweetened beverages, confectioneries, pastries, and other highly processed foods has become a hallmark of the nutrition transition occurring in many low- and middle-income countries (Popkin et al., 2020). Such foods are often energy-dense but nutrient-poor and have been associated with weight gain, obesity, insulin resistance, and cardiovascular diseases (GBD Diet Collaborators, 2022). The presence of these foods in respondents' diets suggests an emerging dietary pattern that combines traditional foods with modern processed products. This trend has been reported in several Nigerian studies and may partly explain the increasing prevalence of overweight and obesity among urban working populations. Overall, respondents reported foods from multiple groups, including cereals, vegetables, fruits, legumes, dairy products, roots and tubers, and animal-source foods, indicating broad food-group variety. However, because the parent instrument did not generate a validated dietary diversity score, the present findings cannot classify respondents as having low, moderate or high dietary diversity, nor can they directly establish nutrient adequacy.

Food-group variety should not be considered equivalent to dietary quality. A diet that includes multiple food groups but also contains excessive amounts of refined carbohydrates, sugar-sweetened beverages, and processed foods may still increase the risk of chronic diseases. The findings of this study have important public health implications. Civil servants constitute a productive segment of the workforce whose nutritional status directly affects productivity, absenteeism, and overall well-being. Promoting healthy food choices through workplace nutrition education, dietary counselling, and health promotion programmes may help improve dietary quality and reduce the burden of diet-related non-communicable diseases among this population. Furthermore, policies that encourage healthier food environments within government establishments may support sustainable improvements in dietary behavior. Taken together, the findings indicate that senior civil servants in Umuahia North consume foods from multiple groups, but opportunities remain to improve dietary quality through increased consumption of fruits, vegetables, legumes, and other nutrient-dense foods, alongside reduced intake of energy-dense processed foods and sugar-sweetened beverages. Such improvements could contribute significantly to the prevention of obesity, cardiovascular diseases, and other nutrition-related chronic conditions among working adults.

LIMITATIONS

This analysis is based on a food-frequency questionnaire developed for the parent study rather than a validated dietary diversity instrument. The available data did not include a standardized recall-period dietary diversity score, predefined diversity cutoff or individual-level score distribution; consequently, dietary diversity scores and proportions meeting a diversity threshold could not be calculated retrospectively. Food-frequency results should therefore be interpreted as descriptive consumption patterns, while food-group variety is presented only as a descriptive concept. The retained records also did not include the denominator required to calculate a survey response rate. Future studies should use a validated dietary diversity instrument with a defined recall period and scoring procedure and should retain complete sampling-flow information.



CONCLUSION

This study described food consumption patterns and dietary variety among senior civil servants in Umuahia North Local Government Area, Abia State, Nigeria. Respondents reported foods from a wide range of groups, including cereals, vegetables, fruits, legumes, dairy products, roots and tubers, and animal-source foods, although consumption frequencies varied considerably across items. The findings also showed consumption of sugar-sweetened beverages and other energy-dense foods. These results identify opportunities for workplace nutrition education that promotes fruits, vegetables, legumes, whole grains and other nutrient-rich foods while discouraging excessive intake of processed foods and sugar-sweetened beverages. Because a validated dietary diversity score was not calculated, the findings should not be interpreted as evidence of a particular level of dietary diversity or nutrient adequacy. Future studies should use standardized dietary diversity indicators with clearly defined food groups, recall periods, scoring procedures and thresholds.

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