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ABSTRACT

Background: Food insecurity remains a critical and global issue affecting several millions of individuals, particularly vulnerable population.

Objectives: This study aimed at assessing household food insecurity, dietary diversity and coping strategy in selected wards in Ido Local Government, Ibadan, Oyo State.

Methodology: This study was cross-sectional in design. A total of 150 respondents from each household were selected from the local government. A semi-structured interviewer-administered questionnaire was used to elicit information. Household food insecurity was measured using the Household Food Insecurity Access Scale (HFIAS). The coping strategy was assessed using the coping strategy index questionnaire adapted by USAID, WFP. A 24-hour dietary recall was used to obtain the dietary diversity of the mothers. The data obtained was analyzed using SPSS version 20 and presented using descriptive statistics.

Results: The household demographic characteristics revealed that 64.7% of the respondents were born in Oyo State. Also 53.3% of the respondents were Oyo state indigene. The prevalence of household food insecurity revealed that food secure household constituted (8%), mildly food insecure (8%), moderately food insecure (74%) and severely food insecure (10%). The household with the least severe coping strategy was (10%), intermediate coping strategy was (12%), severe coping strategy (57.3%) and most severe coping strategy was (20%). For the dietary diversity (43.7%) of the household had low dietary diversity while (52.7%) had medium dietary diversity. There were significant differences between age, household food

insecurity and dietary diversity (p-value < 0.05), also there was significant difference between education level, household food insecurity and dietary diversity. Furthermore, there was no significant differences between ethnicity, household food insecurity and dietary diversity (p-value >0.05).

Conclusion: High prevalence of household food insecurity, low dietary diversity exists among the selected wards in the local government with severe coping strategy. Addressing household food insecurity calls for joint efforts from both government and private sectors.

Keywords*:* Food insecurity, Coping Strategy, Dietary diversity

Introduction

Food insecurity remains a critical and global issue affecting several million of individuals, particularly vulnerable populations (Oderinde et al., 2023). With an increasing undernourished population around the world in recent times, hunger and food insecurity remained on the front burner of most debates globally (Otekunrin et al., 2021). Being food secure is one of the basic rights of human, yet due to several social, economic, and environmental disparities, millions of people are battling with food insecurity. Food insecurity is an important cause of morbidity and mortality, especially among vulnerable populations including women. It is associated with a reduction in the quality of life, a higher proportion of cardiovascular diseases including hypertension and heart disease, metabolic disorders, depression, and poor health outcomes across several illnesses during childhood and adult life. It is also strongly connected with the income level of households though not all households living in poverty are food insecure. Food security exists when all people have physical, social and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life (Oketunde, 2024). Adequacy and quality of food are regarded as a prerequisite for food security that may meet the nutritional requirements for the growth and development of human beings. More than 41 million people in Western and Central Africa are facing acute food insecurity in 2023 and 29 million people currently depend on emergency food assistance with Nigeria been listed among countries struggling with food insecurity (World Food Programme, 2023).

Moreover, food insecurity can further be referred to as a situation “when people do not have adequate physical, social or economic access to food” as defined above. Household food insecurity (HFI) is referred to as a situation of uncertain, insufficient, or unavailable access, or use of food (Obayelu et al., 2021). This has a link with insufficient intake of important nutrients and inadequate resources to afford sufficient food both for individual and household needs, which leads to poor nutrition. When an individual is food insecure, it will affect the productive capacity of that person, and by extension, reduce the productivity of the labour force and result in low-quality human capital development of a country (Otekunrin et al., 2021).

Globally about 2 billion people (26.4%) of the world population in the world experience a moderate or severe level of food insecurity. Among these, 1.04 billion (52%) are found in Asia; 676 million (34%) are in Africa; and 188 million (9%) are in Latin America. The lack of regular access to nutritious and sufficient food that these people experience puts them at greater risk of malnutrition and poor health (Yohannes et al., 2023)

Nigeria is one of the West African countries experiencing food insecurity. The Food and Agriculture Organisation (2021) estimated that 12.1 million Nigerians are in a food insecurity crisis, and it is feared to increase to 16.9 million people if humanitarian support and government

interventions are not scaled up. Although endowed by nature with extensive land mass, varieties of crops in different ecological zones with optimal yield, oil wells and an increasing population, harnessing these resources to provide national food sufficiency has proved problematic (Ukonu et al., 2024).

Nigeria is currently home to over 200 million people and remains the most populous country on the African continent. The World Bank recently reported that Nigeria has turned home to the largest number of poorest people in the world (Oketunde, 2024). This is because the country was still trying to recover from the effects of the economic recession in 2016 when another recession hit in 2020 due to the effects of the COVID-19 pandemic, further disrupting its economic recovery. Food insecurity is a leading cause of morbidity and mortality, especially among vulnerable populations such as children, women and people living with HIV infection. It is associated with a reduction in the quality of life, a higher proportion of cardiovascular diseases including hypertension and heart disease, metabolic disorders, depression, and poor health outcomes across several illnesses during childhood and adult life (Oderinde et al., 2023)

Several studies have assessed the household food security and dietary diversity among household levels in Nigeria (Oketunde, 2024) but very few have laid emphasis on coping strategy based on location density in urban areas. This study therefore assessed dietary diversity level and level of household food insecurity among selected wards in Ido Local Government Area.

Here is a polished academic paraphrase that preserves the original methodology and findings while improving clarity, grammar, and scholarly tone.

MATERIALS AND METHODS

Study Design

A cross-sectional study design was employed to assess household food insecurity, dietary diversity, and food coping strategies among households in Ido Local Government Area.

Study Population

The study population comprised households residing in the selected wards of Ido Local Government Area, Oyo State.

Sampling Technique and Sample Size

A multistage sampling procedure was used to select participants for the study. In the first stage, Ido Local Government Area was purposively selected as the study location. In the second stage, five of the ten wards constituting the Local Government Area were selected using a random sampling procedure. In the third stage, 30 households were randomly selected from each of the five selected wards, resulting in a total sample of 150 households. The sample size was determined using the Fischer formula (Fischer, 1998).

Informed Consent
Consent to participate

Ethical approval was obtained from Ethical Review Committee of the Institute of Advanced Medical Research and Training, College of Medicine, University of Ibadan. Ethical approval was granted under reference number UI/EC/25/0190, in accordance with the principles of the Declaration of Helsinki prior to data collection.

Written informed consent was obtained from the Chairman of the Local Government Area while oral informed consent to participant was subsequently obtained from representatives of participating households. The purpose of the study was clearly explained to the participants, and those who consented to participate were recruited for the detailed investigation.

Data Collection

Data were collected using a semi-structured interviewer-administered questionnaire consisting of several sections. The questionnaire obtained information on the respondents' socio-demographic characteristics, economic characteristics, household food insecurity, food coping strategies, and dietary diversity. Household food insecurity was assessed using the Household Food Insecurity Access Scale (HFIAS), while coping strategies were assessed using a modified coping strategy index. Dietary diversity was determined from information obtained through a 24-hour dietary recall.

Household Food Insecurity

Household food insecurity was assessed using the Household Food Insecurity Access Scale (HFIAS), developed for measuring household food access (Coates et al., 2007). Mothers or household representatives were asked nine questions concerning their household's experiences of food insecurity during the preceding 30 days. The questions covered three major dimensions of food insecurity:

- anxiety and uncertainty regarding access to food (1 question);
- inadequate food quality (3 questions); and
- inadequate food quantity (5 questions).

For each item, respondents were initially asked an occurrence question to establish whether the stated condition had occurred during the previous four weeks. Responses were recorded as either "yes" or "no." When a respondent indicated that an experience had occurred, a frequency-of-occurrence question was subsequently administered to determine whether it occurred rarely (once or twice), sometimes (three to ten times), or more frequently.

Based on their HFIAS responses, households were classified into four food-security categories:

- Food secure: households reporting little or no evidence of food-access problems;
- Mildly food insecure: households that expressed concerns about obtaining food but rarely experienced reductions in food quality or quantity;
- Moderately food insecure: households that compromised food quality and variety and/or reduced the quantity of food consumed; and
- Severely food insecure: households experiencing substantial food-access constraints, including situations in which household members went without food for an entire day.

The classification was based on the HFIAS methodology described by Coates et al. (2007).

Dietary Diversity

Dietary diversity was assessed using the Dietary Diversity Score (DDS). Data from the 24-hour dietary recall were used to determine the number of food groups consumed by each respondent. Foods reported during the recall period were aggregated into nine food groups: starchy staples; dark green leafy vegetables; vitamin A-rich fruits and vegetables; other fruits and vegetables; organ meats; meat and fish; eggs; legumes, seeds and nuts; and milk and milk products.

Each food group consumed contributed one point to the respondent's dietary diversity score. Based on the classification adopted in the study, respondents were categorized as having:

- Low dietary diversity: DDS <4;
- Moderate dietary diversity: DDS 5–8; and
- High dietary diversity: DDS >9.

The dietary diversity assessment was based on the approach described by FAO (2010).

Food Coping Strategies

Food coping strategies were assessed to determine the adaptive measures households employed to manage or mitigate the effects of food insecurity. A modified food coping strategy questionnaire based on the CARE/WFP field methods manual was used for data collection (Maxwell & Caldwell, 2008).

Data Analysis

Data were coded and analysed using the Statistical Package for the Social Sciences (SPSS), version 20. Descriptive statistics were used to summarize the data, with findings presented as frequencies and percentages. The chi-square test was employed to examine associations between socio-demographic characteristics, household food insecurity, and coping strategies. Statistical significance was established at $p < 0.05$.

RESULTS

Table 1 presents the socio-demographic and economic characteristics of the respondents. The findings showed that 64.7% of respondents were born in Oyo State, whereas 35.3% were born outside the state. Similarly, 53.3% identified as indigenes of Oyo State, while 46.7% originated from other states. Christians accounted for 55.3% of the respondents, whereas Muslims constituted 44.7%. The respondents were predominantly female (95.3%), with males accounting for 4.7%.

Regarding marital status, 94.0% of respondents were married, while the remaining 6.0% were single, divorced, or widowed. More than half of the respondents (54.3%) were aged 30–39 years, 8.0% were younger than 30 years, and 37.3% were aged 40 years or older. With respect to educational attainment, 63.3% of respondents had completed secondary education, whereas 11.3% had no formal education.

Table 1: Socio-Demographic and Socio-Economic Characteristics of the Respondents

Variables	Frequency	Percent (%)
State of origin		
Oyo state	80	53.3
Other states	70	46.7
State of birth	97	64.7
Oyo State		
Other states	53	35.3
Marital status	9	6.0
Single/Divorced/widow		
Married	141	94.0
Ethnicity		
Igbo/Hausa/Other Tribes	7	4.6
Yoruba	143	95.3
Religion		
Christianity	83	55.3
Islam	67	44.7
Age (years)	12	8.0
Below 30 years		
30-39 years	82	54.7
40 and above	56	37.3
Education Level		
No formal Education	17	11.3
Primary Education	11	7.3
Secondary Education	95	63.3
Tertiary Education	27	18.0
Occupation		
Civil servant	16	10.7
Farmer	20	13.3
Trader	81	54.0
Artisan	31	20.7
Others	2	1.3
Total	150	100

Table 2 presents the distribution of households according to their level of food security. The findings indicate that 8.0% of households were food secure, 8.0% experienced mild food insecurity, 74.0% were moderately food insecure, while 10.0% experienced severe food insecurity.

Table 2: Household Food Insecurity Scale

Classification	Frequency	Percent (%)
Food Secure	12	8.0
Mildly Food Insecure	12	8.0

Moderately Food Insecure	111	74.0
Severely Food Insecure	15	10.0
Total	150	100.0

Figure 1 shows the prevalence of household food insecurity which was classified into two. The result shows that (8%) was food secure, 92% was food insecure.

Figure 1: Prevalence of Household Food Insecurity

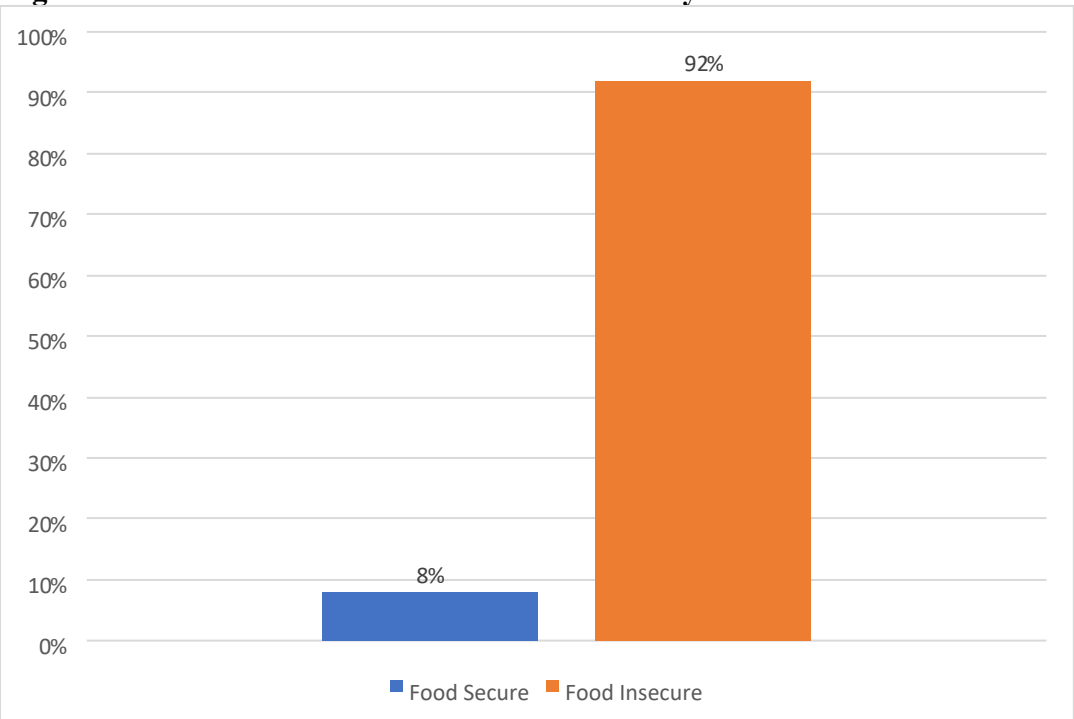


Figure 2 shows that household with the least severe coping strategy was (10%), intermediate coping strategy was (12%), severe coping strategy (57.3%) and most severe coping strategy was (20%).

Figure 2: Distribution of coping strategy among household

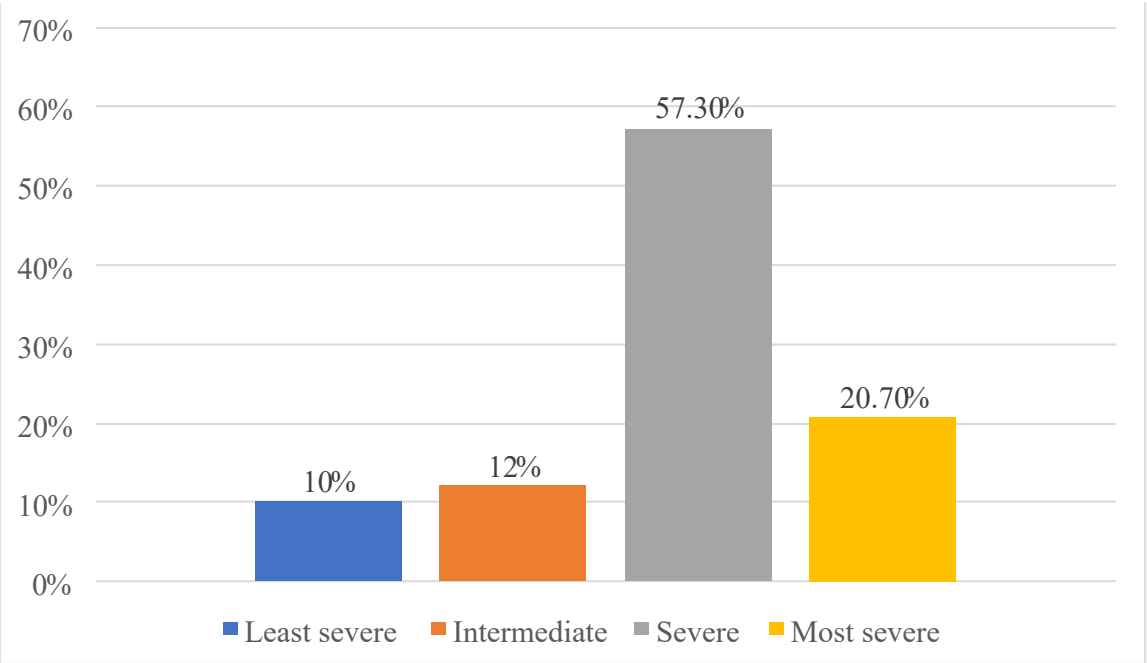


Figure 3 shows that (43.7%) of the household had low dietary diversity while (52.7%) had medium dietary diversity.

Figure 3: Distribution of dietary diversity among household

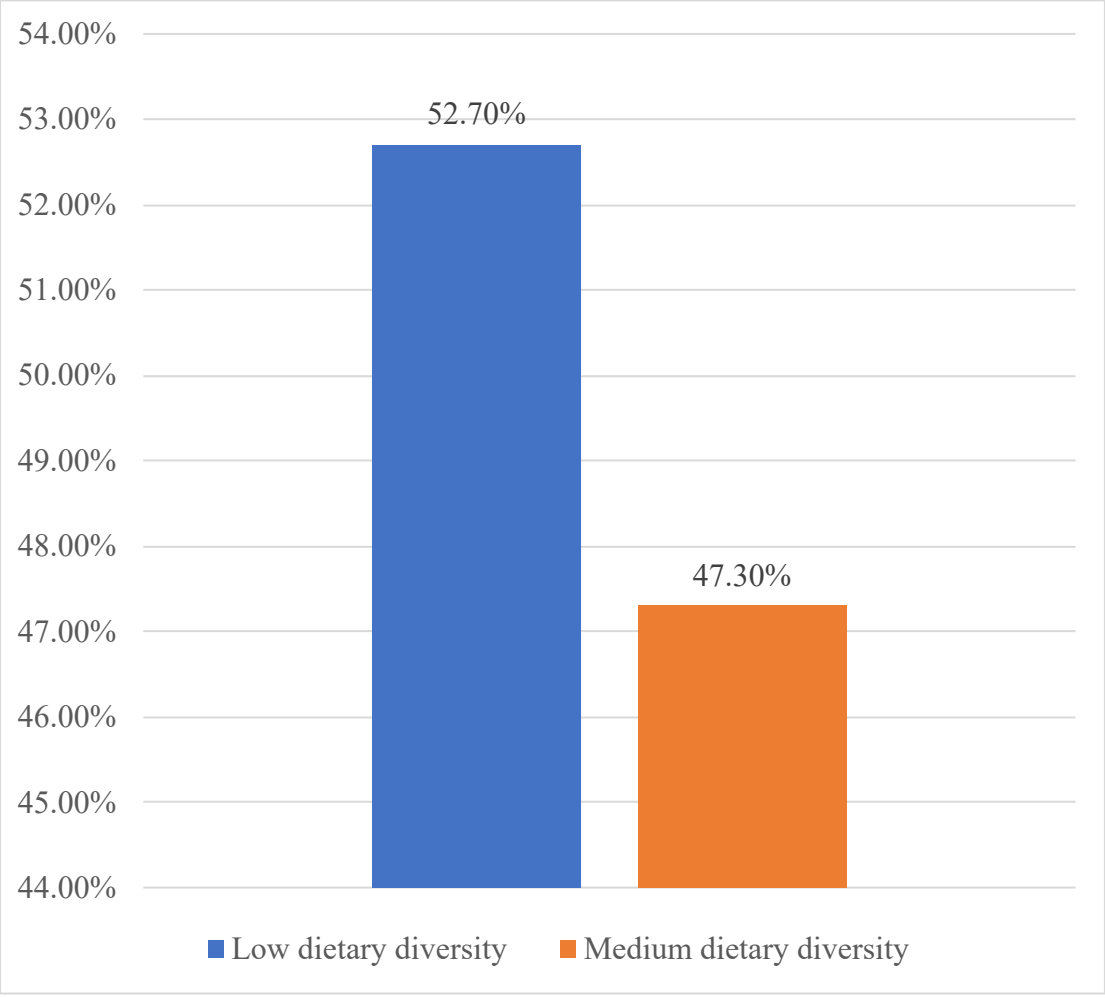


Table 3 shows that age was significantly associated with household food insecurity and dietary diversity ($p < 0.05$). Similarly, educational attainment demonstrated a significant association with both household food insecurity and dietary diversity. However, no statistically significant association was observed between ethnicity and either household food insecurity or dietary diversity ($p > 0.05$). In addition, dietary diversity was significantly associated with marital status ($p < 0.05$).

Table 3 Association between Socio Demographic, Household Food Insecurity and Dietary Diversity

Variables	**Household Food Insecurity**			**Dietary diversity**		
	Food Secure	**Food insecure**	**P-value**	**Low (1-4)**	**Medium (5-8)**	**P-value**
Age(years)						
Below 30	0	12(100)	0.004	4(33.3)	8(66.7)	0.005
30-39	12(14.6)	70(85.4)		36(43.9)	46(56.1)	
40 and above	0(0)	56(100)		39(69.6)	17(30.4)	
Education level						
No formal education	0(0)	17(100)	0.002	14(82.2)	3(17.6)	0.008
Primary Education	0(0)	11(100)		6(54.5)	5(45.5)	
Secondary education	5(5.3)	90(94.7)		51(53.7)	44(46.3)	
Tertiary education	7(25.9)	20(74.1)		8(29.6)	19(70.4)	
Occupation						
Civil servant	7(43.8)	9(56.2)	0.001	5	11(68.8)	0.117
Farmer	0	20(100)		14	6(30.0)	
Trader	0	81(100)		43	38(46.9)	
Artisan	5(16.1)	26(83.9)		15	16(51.6)	
Others	0	2(100)		2	0 (0)	
Household size						
0-4	12(18.5)	53(81.5)	0.000	27(41.5)	38(58.5)	0.021
5-9	0	85(100)		52(61.2)	33(38.8)	
Marital Status						
Single/ divorced/widow	12(8.5)	129(91.5)	0.362	8(88.9)	1(11.1)	0.025
Married	0	9(100)		71(50.4)	70(49.6)	
Ethnicity						
Yoruba	12(8.4)	131(91.6)	0.727	74(51.7)	69(48.3)	0.376
Other tribes	0	7(100)		5(65)	2(35)	

Discussion

The observed relationship between socio-demographic characteristics and dietary diversity is consistent with evidence that social and demographic factors influence dietary practices and nutritional outcomes among Nigerian populations. Ebie et al. (2026), in a study of undergraduates in Abia State, examined the relationship between socio-demographic characteristics, dietary practices, and nutritional status. Although their study population differed from the household-based population in the present study, the findings provide relevant Nigerian evidence supporting the importance of considering socio-demographic factors when assessing dietary practices and nutrition-related outcomes.

Household food insecurity has increasingly become a public health concern globally and across Africa, Nigeria, Oyo State, and communities within Ibadan. The prevalence of household food insecurity observed in the present study is comparable with findings previously reported in Ibadan. Oketunde et al. (2024) reported that 76.0% of households were food insecure, while Obayelu (2018) found that approximately 81.0% of households living in urban slums experienced food insecurity. These findings indicate that inadequate and uncertain access to food remains a persistent challenge in Ibadan. Similarly, studies conducted among households in Osun and Oyo States and North-Central Nigeria have reported substantial levels of food insecurity (Adeniyi & Ojo, 2013; Ayoade & Ige, 2013; Kehinde & Favour, 2020). Okudu et al. (2025) also reported food-security concerns among undergraduates at Michael Okpara University of Agriculture, Umudike. Although these studies involved different populations and geographical settings, their findings collectively demonstrate that food insecurity affects diverse population groups across Nigeria. The association between household food insecurity and the risk of malnutrition, particularly among under-five children, further suggests that inadequate household food access may contribute to poor nutritional outcomes and increase vulnerability to diet-related health problems over the life course.

The findings regarding factors associated with household food insecurity are also consistent with evidence from Nigeria and other African countries. Previous studies conducted in Kenya, Ethiopia, Ghana, Kano, and Oyo State have identified low educational attainment, unemployment, and large household size as important factors contributing to household food insecurity (Adepoju & Adejare, 2013, 2016; Mutisya et al., 2016; Agbadi et al., 2017; Anugwa & Agwu, 2019). In the present study, maternal educational status was significantly associated with household food insecurity, with households in which mothers had little or no formal education being more likely to experience food insecurity than those with better-educated household members. This observation is consistent with findings from rural households in Edo State, Nigeria (Ehebhamen et al., 2017), and those reported by Diramo et al. (2018). Education may improve access to nutrition and food-security information, enhance decision-making capacity, and increase opportunities for income diversification. Greater educational attainment may therefore strengthen households' capacity to secure food through improved livelihood opportunities, agricultural practices, and resource management.

Food-insecure households in the present study adopted various coping strategies to manage inadequate food availability and limited resources. This finding agrees with Iheme et al. (2026), who reported that households in South-East Nigeria commonly responded to food insecurity by reducing meal portions, consuming less preferred foods, decreasing meal frequency, and obtaining food on credit. Similarly, Quinton et al. (2024) found that Nigerian households experiencing food insecurity adopted multiple coping strategies, with both the severity and

number of strategies increasing as the level of food insecurity worsened. These findings suggest that households commonly rely on short-term adaptive responses to reduce the immediate effects of food shortages and financial constraints. The specific strategies adopted in the present study appeared to vary according to the severity of household food insecurity, ranging from relatively less disruptive measures to more severe responses.

The pattern of coping strategies further indicates that households may progressively adopt more detrimental measures as food insecurity intensifies. In the present study, less severe and moderately severe strategies were used more frequently than the most severe coping mechanisms. This progression may involve an initial attempt to preserve household resources, followed by the reduction or disposal of assets and, in more extreme circumstances, strategies associated with destitution. Such a pattern is consistent with Yohannes et al. (2023), who demonstrated that the severity of food insecurity influences the nature and intensity of coping responses. The findings highlight the importance of addressing food insecurity before households are compelled to adopt coping strategies that may undermine their longer-term economic resilience and food security.

Household dietary diversity was also limited, with fewer than half of the households recording dietary diversity scores above five. Consumption of eggs, meat, fruits, and milk and milk products was particularly low among respondents in the selected local government area. The relatively limited consumption of these food groups may partly reflect constrained household purchasing power, particularly where the prices of animal-source foods and fruits place them beyond the regular food budgets of economically vulnerable households. This pattern is comparable with findings reported by Oketunde (2024), who also identified limitations in the consumption of diverse food groups among households experiencing food-access constraints. In addition to economic barriers, inadequate knowledge regarding the nutritional importance of diverse food groups may influence household food choices. Nutrition education should therefore complement food-security interventions by emphasizing practical and affordable ways of diversifying household diets. Greater dietary diversity can help improve the adequacy of essential nutrients, including protein, vitamins, and minerals, alongside sufficient energy intake, thereby supporting healthier household nutritional outcomes.

Conclusion

This study revealed high prevalence of food insecurity. High levels of household food insecurity were found among respondents in each of the locations considered. Starchy staples were the most commonly consumed food groups while micronutrient- rich foods and vegetables were consumed at low levels especially among women in the household. This situation therefore raises concerns about the physical health and nutritional status of women. Interventions from government and private organizations are therefore essential to improving food security levels in the different density areas through promotion of nutrition education and empowerment programs among women in the household.

Recommendation

Addressing household food insecurity calls for joint efforts from both the government and private sectors. Enhancing access to nutrition education and practical dietary guidance can help increase the intake of micronutrient-dense foods including fruits, vegetables, and animal-based products particularly in vulnerable households. Furthermore, empowering women through initiatives that promote continuous food production can strengthen household food availability and contribute to improved community nutrition outcomes.

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Author Contributions

C.V.E: worked on the conception, methodology, investigation, data curation, writing original draft, manuscript preparation, revision and provided resources.
J.O.S: worked on conception, methodology, investigation, data curation, writing original draft, manuscript preparation, revision and provided resources.
U.B.I: worked on the investigation, provided resources, supervision.
E.M.O: worked on the investigation, validation, manuscript preparation, revision, and provided resources.
All authors reviewed the manuscript.

Declaration of Generative AI and AI-Assisted Technologies in Scientific Writing

AI was used to comprise and correct grammatical. CHATGPT and quillbot was used.

Availability of data and materials

The data and materials supporting the findings of this study are available from the corresponding author upon reasonable request.

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Clinical trial number: Not applicable.

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