

ORIGINAL RESEARCH ARTICLE

Food Security Status, Dietary Diversity, and Food-Related Coping Strategies
Among Female Young Adults in Ibadan, Nigeria

Mofinyinfo luwa P. Ogungbure¹, Temilade W. Arulogun¹ , David A. Oladipo^{1*} ,
Folake O. Samuel¹ 

¹Department of Human Nutrition and Dietetics, Faculty of Public Health, College of Medicine, University of Ibadan, Ibadan, Nigeria.

DOI: [https://doi.org/10.70851/jfines.2026.3\(3\).247.258](https://doi.org/10.70851/jfines.2026.3(3).247.258)

Article history

Received;

24 March, 2026

Revised;

23 July, 2026

Accepted;

25 July, 2026

Keywords

minimum dietary diversity,
food security,
female young adults,
coping strategies

ABSTRACT

Food insecurity disproportionately affects women of reproductive age due to socioeconomic vulnerabilities and increased nutritional demands. This study investigated the food security status, dietary diversity, and coping mechanisms employed by female young adults in Ibadan, Nigeria. A cross-sectional study was conducted among 404 female young adults aged 18-35 years, recruited through a non-probability convenience sampling approach. Food security and MDD-W was determined using the Food Insecurity Experience Scale (FIES) and Diet Quality Questionnaire, respectively. Data was analyzed using Statistical Package for Social Sciences (SPSS). Most of the respondents (70.3%) were aged 18-24 years and approximately 64% had completed tertiary education. Only 26.7% of the respondents were food secure and 64% had met the minimum dietary diversity score. The most common coping strategies included relying on less preferred and less expensive foods (77.1%) and borrowing food or relying on help from a friend or relative (11.2%). In the multivariable binary logistic regression model, minimum dietary diversity (unmet vs. met; AOR = 2.36, 95% CI: 1.27–4.36), monthly income (₦50,000 and below vs. ₦100,001 and above; AOR = 21.79, 95% CI: 8.30–57.23), and living arrangement (with family vs. alone; AOR = 3.57, 95% CI: 1.34–9.55) were significantly associated with food insecurity. While food insecurity was highly prevalent among young female adults in Ibadan, dietary diversity was relatively better, with about two-thirds of respondents meeting the minimum recommended threshold. Adverse coping strategies were also identified. Targeted interventions are needed to improve food access and strengthen women's food security.

*Corresponding author

E-mail: oladipoakinola66@gmail.com (David A. Oladipo).

Peer review under responsibility of Journal of Food Innovation, Nutrition, and Environmental Sciences.

A Publication of EcoScribe Publishers company Limited,
Uganda. www.ecoscribepublishers.com

All the articles published by [Journal of Food Innovation, Nutrition, and Environmental Sciences](#) are licensed under a [Creative Commons Attribution 4.0 International \(CC-BY\) License](#) Based on a work at <https://jfines.org>



1. INTRODUCTION

The Sustainable Development Goals (SDGs) of the United Nations, especially SDG 2 (Zero hunger) and SDG 3 (Good health and well-being), emphasize the need to improve nutrition and achieve global food security by 2030 (United Nations, 2015). However, this target remains far from reality for many countries, particularly in sub-Saharan Africa (SSA), where persistent poverty, conflict, climate variability, and economic instability continue to undermine progress toward achieving adequate food access, dietary diversity, and optimal nutrition outcomes.

Food security is defined as a condition in which all people, at all times, have physical, social, and economic access to sufficient, safe, and nutritious food that meets their dietary needs and food preferences for an active and healthy life (Mbow et al., 2019). Food insecurity is the “lack of the financial resources to ensure reliable access to food to meet dietary, nutritional, and social needs (Blake, 2019). Globally, food insecurity persists. The State of Food Security and Nutrition (SOFI) reports that 2.3 billion people, representing about 28% of the global population, were moderately or severely food insecure in 2025. In Nigeria, 25 million Nigerians were projected to be at risk of experiencing hunger by the third quarter of 2023 (UNICEF, 2023). The consequences of food insecurity are severe, affecting health, productivity, economic growth and overall wellbeing adversely (Mukaila et al., 2021).

In Nigeria, food insecurity varies across households and is directly influenced by intra-household dynamics including decision-making procedures and household structure (Owoo, 2018). Women especially experience slightly higher rates of acute food insecurity worldwide and in different locations such as Africa, this is quite concerning because women are primarily in charge of food preparation and family care (FAO et al., 2014; Elum, 2021). This gender disparity is particularly concerning given women’s central role in food procurement, preparation, and caregiving. Response to food insecurity has led to the adoption of coping strategies among households and individuals. Coping strategies (CS) entail any measures adopted by individuals and households to minimize their spending or obtain extra revenue in order to pay for basic necessities and not be relegated too far behind society’s level of wellbeing (Snel and Staring, 2001). Some coping strategies adopted among women include eating less preferred foods, reducing meal portions, borrowing food or money, and maternal buffering (Akerele et al., 2013).

Dietary diversity is an essential component of food security, which focuses not only on access to food but also on the variety and quality of diets within households (Nicholson et al., 2020; Clapp et al., 2022). It is a qualitative measure of food consumption that reflects household access to a variety of foods and is also a proxy for nutrient adequacy of the diet of individuals" (Kennedy et al., 2011). Consumption of a diverse diet across multiple food groups is essential for meeting micronutrient requirements and reducing the risk of

micronutrient deficiencies, particularly among women of reproductive age (Yeneabat et al., 2019). Despite these benefits only slightly more than half of women of reproductive age in Nigeria were reported to have met the minimum dietary diversity (Ariyo et al., 2025). Therefore, the promotion of dietary diversity has been encouraged to address nutritional issues due to insufficient consumption of micronutrients (Yeneabat et al., 2019).

Female young adulthood represents a nutritionally and socially vulnerable life stage, characterized by significant physiological, hormonal, social, and economic transitions. Women aged 18–35 years face increased nutritional demands related to menstruation, pregnancy, and lactation, while simultaneously navigating educational pursuits, employment instability, and limited income opportunities (Feskens et al., 2022). This group is also exposed to high rates of unemployment, social isolation, stigmatization, and low incomes, all of which adversely affect their livelihoods and economic status, and levels of food insecurity (Sithole and Dinbabo, 2016; Elgar et al., 2021). Despite this, numerous studies in Nigeria have assessed the dietary diversity and food security at household levels (Oyebanjo et al., 2013; Ambali et al., 2015; Obasan et al., 2017; Egwue et al., 2020; Mukaila et al., 2021) with limited focus on individual-level.

In addition, female young adults play important roles in ensuring nutrition and diet quality as they are often involved in the processing and preparation of food for their households (Anugwa and Agwu, 2016). These peculiarities justify the focus on this demographic, as their unique developmental and socioeconomic transitions may have distinct implications for dietary diversity and food security. Hence, this study examined the food security, dietary diversity and coping strategies adopted by female young adults in Ibadan, Nigeria.

2. METHODOLOGY

2.1 Study design

This study employed a cross-sectional design.

2.2 Study area

The study was conducted in Ibadan North Local Government Area (LGA), one of the urban LGAs in Ibadan metropolis, Oyo State, southwestern Nigeria. Ibadan is a major urban center characterized by diverse socioeconomic activities, educational institutions, and varying income levels, making it suitable for examining food security and dietary patterns among young adults.

2.3 Study population, sample size, and sampling technique

The study population comprised female young adults aged 18–35 years residing in Ibadan North LGA at the time of the study. Eligibility criteria included being within the specified

age range, residing in the study area, and providing informed consent. Pregnant women who were severely ill or respondents who declined consent were excluded.

Participants were recruited both in-person and online using a non-probability convenience sampling approach between January to March, 2025. Female young adults aged 18–35 years were approached in-person at selected homes and shops within the study location, as well as invited through survey links shared via online platforms. Regardless of recruitment channel, the questionnaire was self-administered online, with participants independently completing the survey via the Kobo Collect app. As a non-probability approach was adopted, no formal sampling frame or randomization procedure was applied; participants were enrolled based on availability and willingness to participate. To minimise the risk of multiple responses, each participant's phone number was recorded and cross-checked to prevent duplicate entries. Eligible participants who provided informed consent were enrolled in the study.

2.4 Sample size determination

The sample size was calculated using the single population proportion formula described by Charan and Biswas (2013): $n = Z^2pq/d^2$. A 95% confidence level ($Z = 1.96$), a 5% margin of error ($d = 0.05$), and an estimated prevalence (p) of 50% were used, with q calculated as $(1 - p)$. The minimum required sample size was 384 participants. After adjusting for a 5% non-response rate, the estimated sample size was increased to 403 participants. During data collection, 415 eligible participants were recruited, of whom 404 were included in the final analysis.

2.5 Data collection instruments and procedure

Data were collected using a structured questionnaire administered through self-administered approaches. The questionnaire was administered in both English and Yoruba. The questions captured information on respondents' socio-economic and socio-demographic characteristics of participants, food security status, dietary diversity, and coping strategies. Data on food security status was collected using the FAO Food Insecurity Experience Scale (FIES), a standardized and validated instrument that has been widely applied across diverse cultural settings, including low- and middle-income countries (FAO, 2016; Cafiero et al., 2018). The FIES has also been previously applied among Nigerian populations, including a study assessing food insecurity among adults in Ibadan, Nigeria (Ariyo et al., 2026), supporting its contextual relevance for the present study. It contains eight standardised questions in total. The eight questions were answered with a yes or no, and the answers were combined to produce raw scores that range from 0 to 8. Following the categorization used by Wambogo et al. (2018), households were classified as food secure (raw score 0–3), moderately food insecure (raw score 4–6), or severely food insecure (raw score 7–8).

Data on dietary diversity was collected using the Diet Quality Questionnaire, aligned with the Minimum Dietary Diversity for Women (MDD-W) indicator. Participants reported all

foods consumed over the previous 24 hours across ten food groups. A score of one was assigned for each food group consumed, yielding a maximum score of ten. Respondents who consumed foods from five or more food groups were considered to have achieved minimum dietary diversity (FAO, 2021).

Coping strategies were assessed using the Coping Strategies Index (CSI), a validated food security assessment tool that captures behavioural responses adopted by individuals and households during periods of food shortage or limited access to food (Maxwell and Caldwell, 2008). The Coping Strategy Index (CSI) was used to descriptively assess the types of coping strategies employed by respondents; a weighted composite score was not calculated, as this was beyond the scope of the present study. Consent form was written in English and interpreted to participants in the local language.

2.6 Data analysis and interpretation

Data obtained was imported into an Excel spreadsheet from the Kobo tool app, cleaned, and imported into Statistical Package for Social Sciences software (SPSS) version 24 for analysis. Descriptive statistics, including frequencies and percentages, were used to summarize categorical variables. Associations between categorical variables were assessed using the chi-square test. Food security status, the dependent variable, was assessed using the Food Insecurity Experience Scale (FIES), and was recoded into a binary outcome variable for regression analysis, with original categories merged; moderately, and severely food insecure households classified as food insecure (coded 1) and food secure households coded as 0. Multivariate logistic regression analysis was performed to identify factors associated with food insecurity among the study participants. Independent variables that showed significant associations during bivariate analysis ($p < 0.05$); these included level of education, age range, minimum dietary diversity (MDD), marital status, occupation, monthly income, and living arrangement. Categorical independent variables with more than two categories were entered into the model using tertiary education, 18–24 years, met MDD, single, employed, ₦100,001 and above, and living alone as the reference categories, respectively. Due to a very small number of respondents in the Primary education category ($n = 2$), this was combined with the Secondary category to form a single 'Primary/Secondary' group prior to analysis. The results were presented as adjusted odds ratios (AORs) with 95% confidence intervals (CIs), and statistical significance was set at $p < 0.05$. Statistical significance was set at $p < 0.05$.

2.7 Ethical approval

Ethical approval was obtained from the University of Ibadan/University College Hospital ethics committee with ethical approval number (UI/EC/24/01036).

3. RESULTS

3.1 Sociodemographic characteristics of female young adults surveyed

The socio-demographic, economic, and household characteristics of respondents are presented in **Table 1**. For the age categories, majority (70.3%) were aged 18-24 years,

some (28.7%) were aged 25-30 years and very few (1.0%) were aged 31-35 years. In terms of the level of education, majority (64.1%) had tertiary education. The employment status of the respondents revealed that 60.9% were student, 24.5% were self-employed, 13.4% were employed and 1.2% were unemployed. Information on the monthly income of the respondents showed that 18.8% earned below 20,000 naira, 41.8% earned 20,000-50,000 naira, 26.0% earned between 51,000 to 100,000 naira, 10.4% earned between 100,001-200,000 naira, and 3.0% earned above 200,000 naira.

Table 1. Sociodemographic Characteristics of Female Young Adults Surveyed

Variable	Frequency (%)
Age (years)	
18-24	284 (70.3)
25-30	116 (28.7)
31-35	4 (1.0)
Marital status	
Single	384 (95.0)
Married	20 (5.0)
Level of education	
Primary	2 (0.5)
Secondary	143 (35.4)
Tertiary	259 (64.1)
Employment status	
Student	246 (60.9)
Self-employed	99 (24.5)
Employed	54 (13.4)
Unemployed	5 (1.2)
Level of income per month (₦)	
Below 20,000	76 (18.8)
20,000-50,000	169 (41.8)
51,000-100,000	105 (26.0)
100,001-200,000	42 (10.4)
Above 200,000	12 (3.0)
Living arrangement	
Alone	377 (93.3)
With family	27 (6.7)

3.2 Respondent's food security level

The affirmative responses to the food security questions are presented in **Table 2**. Approximately 84.2% of the respondents were worried they would not have enough food to eat, about 62% were unable to eat healthy or nutritious food. Another 86% only ate few kinds of foods, 74.5% had to skip a meal, 67.3% ate less than they thought they should

and 46.5% ran out of food. About 65% were hungry but did not eat and 9.9% went without eating for a whole day.

Figure 1 revealed the respondent's level of food insecurity. Results showed that below half of the respondents (27%) were food secure. 41% of the respondent were moderately food insecure, while only 32% of the respondents were severely food insecure. The level of food insecurity (moderate and severe) among the respondent was 73%.

Table 2. Affirmative responses to the food security questions

Question	Frequency (%)
You were worried you would not have enough food to eat	340 (84.2)
You were unable to eat healthy and nutritious food	250 (61.9)
You ate only a few kinds of foods	348 (86.1)
You had to skip a meal	301 (74.5)

Question	Frequency (%)
You ate less than you thought you should	272 (67.3)
You or your household ran out of food	188 (46.5)
You were hungry but did not eat	264 (65.3)
You went without eating for a whole day	40 (9.9)

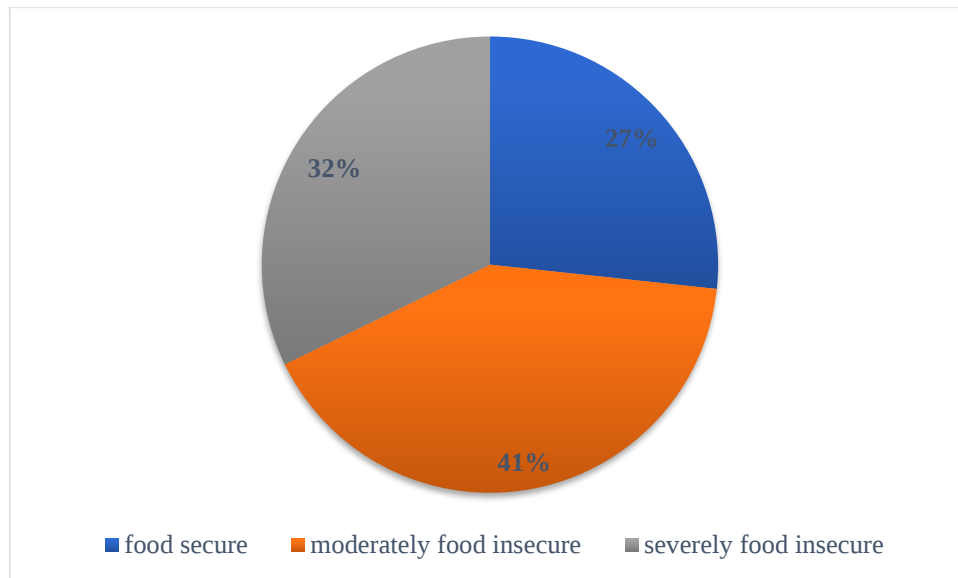


Fig. 1. Respondents' Level of Food Insecurity

3.3 Dietary diversity of the female young adults

The distribution of food groups consumed by the respondents is presented in **Figure 2**. The most frequently consumed food groups were grains, white roots and tubers, and plantain (99.8%), followed by other vegetables (86.6%), and meat, poultry, and fish (85.4%). Consumption of other food groups was comparatively lower, including eggs (50.0%), pulses such as beans, peas, and lentils (45.5%), dark green leafy

vegetables (32.9%), other fruits (37.9%), and nuts and seeds (27.5%).

As shown in **Figure 3**, 64% of the female young adults achieved the minimum dietary diversity for women of reproductive age, defined as consumption of at least five out of the ten recommended food groups within the previous 24 hours.

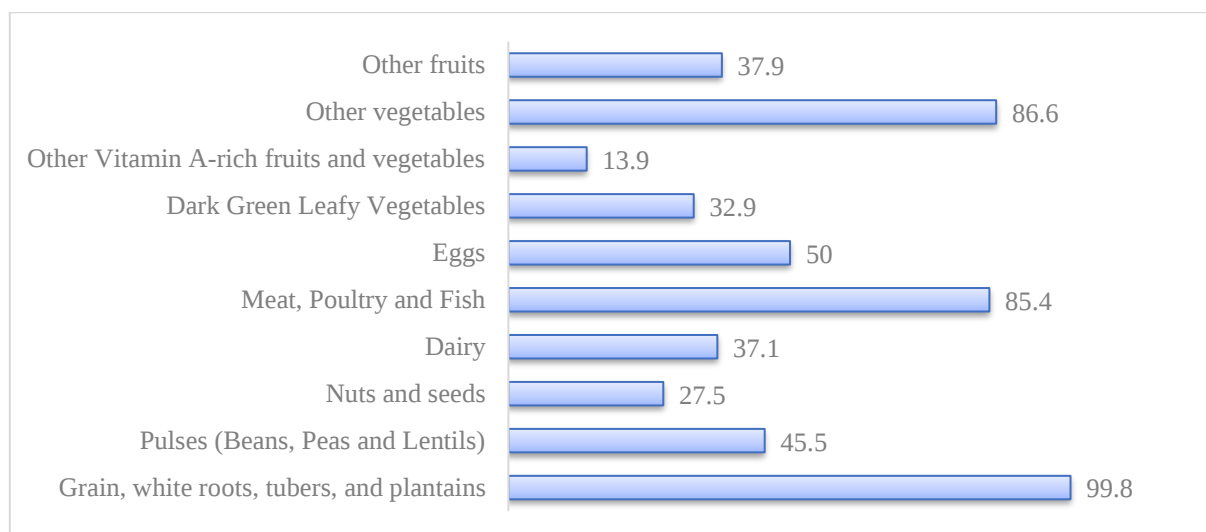


Fig. 2. Distribution of food groups consumed by the respondents

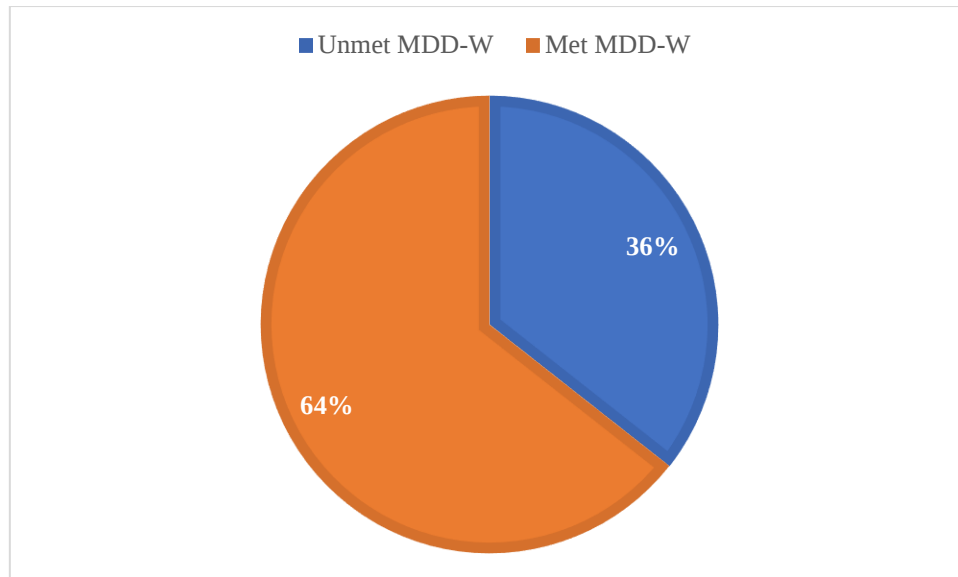


Figure 3. Minimum Dietary Diversity of the Female Young Adults

3.4 Association between respondents' characteristics and minimum dietary diversity status

Table 3 presents the association between respondents' characteristics and dietary diversity status. Age, level of education, occupation, and monthly income were all significantly associated with dietary diversity status ($p < 0.05$). A statistically significant association was found between age and dietary diversity status ($p = 0.014$); a higher proportion of respondents aged 25 years and above met the minimum dietary diversity threshold (73.3%) compared to

those aged 18–24 years (60.6%). Employed respondents recorded the highest proportion of met dietary diversity (83.3%), followed by the self-employed (70.7%), while students/unemployed respondents recorded the lowest proportion (57.8%). Similarly, level of education was significantly associated with dietary diversity status ($p = 0.008$). Respondents with tertiary education were more likely to meet minimum dietary diversity (69.1%) compared to those with only primary/secondary education (55.9%), $p = 0.002$.

Table 3. Association between Minimum Dietary Diversity and Respondents' Characteristics

Variable	Unmet MDD-W	Met MDD-W	P-value
Age			
18-24	112 (39.4)	172 (60.6)	0.014*
25 and above	32 (26.7)	88 (73.3)	
Marital status			
Married	5 (25.0)	15 (75.0)	0.308
Single	139 (36.2)	245 (63.8)	
Level of education			
Primary/Secondary	64 (44.1)	81 (55.9)	0.008*
Tertiary	80 (30.9)	179 (69.1)	
Occupation			
Employed	9 (16.7)	45 (83.3)	0.002*
Self employed	29 (29.3)	70 (70.7)	
Student/unemployed	106 (42.2)	145 (57.8)	
Monthly income			
₦50,000 and above	107 (43.7)	138 (56.3)	0.000*
₦51,000 - ₦100,000	27 (25.7)	78 (74.3)	
Above ₦200,000	10 (18.5)	44 (81.5)	

3.5 Food Coping Strategies adopted by the Respondents

The food coping strategies adopted by the respondents are presented in **Table 4**. Using responses for every day, pretty

often and once in a while, majority of the respondents reported to have relied on less preferred and less expensive foods (77.1%), some had borrowed food or relied on help from a friend or relative (11.2%). Purchasing food on credit

and gathering wild food, hunting or harvesting immature crops were reported among 6.0% and 0.7% of the respondents, respectively. Some respondents have had to eat somewhere else (12.9%), while others begged for food

(0.7%). Other strategies included limiting portion size at mealtimes (66.3%), rationing money to buy prepared food (41.5%), reducing the number of meals eaten in a day (67%) and going an entire day without eating (5.5%).

Table 4. Food Coping Strategies of the Surveyed Female Young Adults

Variable	Everyday	Pretty often (5-6 days)	Once in a while (1-2 days)	Hardly	Never
Relied on less preferred and less expensive foods	39 (9.7)	121 (30.0)	151 (37.4)	59 (14.6)	34 (8.4)
Borrowed food, or relied on help from a friend or relative	2 (0.5)	6 (1.5)	37 (9.2)	109 (27.0)	250 (61.9)
Purchased food on credit	2 (0.5)	4 (1.0)	18 (4.5)	18 (4.5)	358 (88.6)
Gathered wild food, hunted or harvested immature crops	0 (0.0)	1 (0.2)	1 (0.2)	2 (0.5)	400 (99.0)
Consumed seed stock held for next season	0 (0.0)	1 (0.2)	2 (0.5)	5 (1.2)	396 (98.0)
Went to eat elsewhere	3 (0.7)	10 (2.5)	39 (9.7)	40 (9.9)	312 (77.2)
Begged for food	0 (0.0)	1 (0.2)	2 (0.5)	4 (1.0)	397 (98.3)
Limited portion size at mealtimes	34 (8.4)	81 (20.0)	153 (37.9)	71 (17.6)	65 (16.1)
Rationed money to buy prepared food	11 (2.7)	51 (12.6)	106 (26.2)	147 (36.4)	89 (22.0)
Reduced the number of meals eaten in a day	30 (7.4)	78 (19.3)	154 (38.1)	87 (21.5)	55 (13.6)
Gone an entire day without eating	0 (0.0)	6 (1.5)	16 (4.0)	22 (5.4)	360 (89.1)

3.6 Predictors of food security among the respondents

As presented in **Table 5**, bivariate analysis showed that food security status was significantly associated with respondents' age, level of education, marital status, occupational status, minimum dietary diversity for women, and monthly income ($p < 0.05$).

Results of the multivariable logistic regression analysis are shown in **Table 6**. In the multivariable binary logistic regression model, minimum dietary diversity (MDD), monthly income, and living arrangement were significantly associated with food insecurity, while level of education, age range, marital status, and occupation were not significant predictors. Participants with unmet minimum dietary diversity had significantly higher odds of food insecurity compared to those with met minimum dietary diversity (AOR = 2.36, 95% CI: 1.27–4.36, $p = 0.006$). Monthly

income showed a strong graded association with food insecurity. Compared to participants earning ₦100,001 and above (reference category), those earning ₦50,000 and below had markedly higher odds of food insecurity (AOR = 21.79, 95% CI: 8.30–57.23, $p < 0.001$), while those earning ₦51,000–₦100,000 also had significantly higher odds of food insecurity (AOR = 5.00, 95% CI: 2.18–11.44, $p < 0.001$), relative to the highest income group.

Level of education (primary/secondary vs. tertiary, reference) was not significantly associated with food insecurity (AOR = 0.61, 95% CI: 0.32–1.18, $p = 0.141$). Similarly, age range (25 years and above vs. 18–24 years, reference; AOR = 1.39, 95% CI: 0.70–2.79, $p = 0.348$), marital status (married vs. single, reference; AOR = 0.85, 95% CI: 0.24–2.95, $p = 0.797$), and occupation (overall $p = 0.143$) were not significantly associated with food insecurity in the adjusted model.

Table 5. Association between Food Security and Respondents' Characteristics

Variable	Food secure (%)	Moderately food insecure (%)	Severely food insecure (%)	p-value
Age range (years)				
18-24	59 (20.8)	119 (41.9)	106 (37.3)	0.000*
25 and above	49 (42.2)	47 (39.2)	24 (20.0)	
Marital status				0.027*

Variable	Food secure (%)	Moderately food insecure (%)	Severely food insecure (%)	p-value
Married	8 (40.0)	11 (55.0)	1 (5.0)	
Single	100 (26.0)	155 (40.4)	129 (33.6)	
Educational level				
Primary/Secondary	28 (19.3)	57 (39.3)	60 (41.4)	0.005*
Tertiary	80 (30.9)	109 (42.1)	70 (27.0)	
Occupational Status				0.000*
Employed	35 (64.8)	16 (29.6)	3 (5.6)	
Self-employed	33 (33.3)	42 (42.4)	24 (24.2)	
Student/unemployed	40 (15.9)	108 (43.0)	103 (41.0)	
Monthly income (₦)				0.000*
₦50,000 and below	28 (11.4)	101 (41.2)	116 (47.3)	
₦51,000 – ₦100,000	39 (37.1)	53 (50.5)	13 (12.4)	
Above ₦100,000	41 (75.9)	12 (22.2)	1 (1.9)	
Living arrangement				0.234
Alone	98 (26.0)	154 (40.8)	125 (33.2)	
With family	10 (37.0)	12 (44.4)	5 (18.5)	
MDD-W				0.000*
Unmet	21 (14.6)	60 (41.7)	63 (43.8)	
Met	87 (33.5)	106 (40.8)	67 (25.8)	

*Value is statistically significant at P<0.05

Table 6. Predictors of food security among the respondents

Variable	OR (95% CI)	P-value
Marital status		
Single	Ref	0.734
Married	0.809 (0.238-2.753)	
Level of education		
Primary/Secondary	0.613 (0.320-1.176)	0.141
Tertiary	Ref	
Occupation		
Employed	Ref	0.113
Self-employed	1.970 (0.852-4.555)	
Student/Unemployed	2.540 (0.992-6.504)	
Monthly income		
50,000 naira and below	21.787 (8.295-57.226)	0.000*
51,000 – 100,000	4.995 (2.181-11.439)	
Above 100,000	Ref	0.000*
Living arrangement		
Alone	Ref	0.011*
With family	3.574 (1.339-9.545)	
MDD-W		
Unmet	2.355 (1.271 – 4.361)	0.006*
Met	Ref	
Marital status		
Single	Ref	0.797
Married	0.849 (0.244 – 2.950)	

*Value is statistically significant at P<0.05

4. DISCUSSION

The study investigated the food security status, dietary diversity and coping strategies of female young adults in Ibadan, Nigeria. This study represents one of the few studies conducted among this socially vulnerable population in recent years. The findings revealed a high prevalence of food insecurity and low dietary diversity, highlighting them as significant nutritional challenges faced by young women in this urban setting. Information on the food security status of the respondents showed that few of the respondents were food secure. When compared with individual-level prevalence estimates, the food insecurity observed in the present study aligns more closely with patterns reported elsewhere in Nigeria. Ariyo et al. (2026) reported high level of food insecurity among mothers living in a barrack in Ibadan, using the same Food Insecurity Experience Scale (FIES) applied in the present study. This study was also conducted in South-West Nigeria, the same geopolitical zone as the present study, further strengthening the relevance and comparability of this finding.

This pattern is further supported by Ukegbu et al. (2019) and Oladipo et al. (2025), who similarly reported a high prevalence of food insecurity among university/medical students in Nigeria, using the 10-item US Household Food Security Survey Module (HFSSM). Although the HFSSM captures household-level food access rather than a purely individual-level experience, the comparison remains relevant given that a large majority of respondents in the present study were also students, suggesting that similar income-related vulnerabilities may contribute to food insecurity among student populations across different geopolitical zones in Nigeria.

The low food security levels reported among this population could have intergenerational and livelihood implications, adolescents who were food insecure were shorter than their peers who were food secure, this may influence adult productivity and childbirth outcomes (Belachew et al., 2013). Additionally, low food security may paradoxically increase risk of unhealthy weight gain (Gooding et al., 2012). Bivariate analysis using chi-square test showed significant association between food security status and several sociodemographic variables including age, level of education, marital status, occupation, and income. Previous research has shown a clear correlation between food insecurity and individual variables such as lower educational attainment, lower income, unemployment, renting a home, and single parenthood (Rosier, 2011, Banks et al., 2021). In the logistic regression model, monthly income was found to be a significant predictor of food security. This implies that female young adults with lower monthly income were less likely to be food secure compared to those with higher earnings. This result supports previous research that found low income to be a significant factor in food insecurity since it limits people's capacity to buy a range of nutrient-dense foods (Akerle et al., 2013; Elgar et al., 2021). The correlation between young women's income and food security highlights their economic fragility, especially in

situations where gender gaps in employment and income continue to exist.

Food insecurity is closely linked to dietary diversity. Individuals who experience food insecurity often have compromised diet quality as this is attributable to nutrient-poor energy-dense foods which cost less than lean meats, vegetables, and fruits (Drewnowski, 2019; Elsahoryi et al., 2020). The consumption pattern showed that grains, white roots and tubers, and plantain were consumed the most of the 10 food groups, with fewer consumption of pulses, nuts, seeds, and other fruits and vegetables. This dietary pattern aligns with prior studies among similar population (Offei-Ansah, 2012, Oladipo et al., 2025). The heavy reliance on these food groups reflects the coping strategies adopted by respondents during periods of food insecurity. A considerable proportion reported resorting to less preferred and less expensive foods, as well as rationing money to buy prepared food. These coping strategies adopted coincides with previous study conducted in South-West, Nigeria (Akerle et al., 2013). When combined with limited dietary options of lower nutritional value, these compensatory tactics used during food shortage may ultimately result in over-consumption of energy and cyclical weight gain (Seligman and Schillinger, 2010; Spees et al., 2017).

Several cross-sectional studies have shown that a high dietary diversity improves mental health and lowers the risk of depression, diabetes mellitus, hypertension, and cardiovascular illnesses in older adults living in the community (Poorrezaeian et al., 2017; Emerson et al., 2020; Chalermisri et al., 2022). In this study, a good proportion had met the Minimum Dietary Diversity for Women (MDD-W), indicating the consumption of at least five of the ten recommended food groups in the previous day. This proportion is higher than the 29.7% reported in Bangladesh (Shaun et al., 2023) and the 54% reported in Nigeria (Ariyo et al., 2025). However, more than one-third of respondents did not achieve the minimum dietary diversity, suggesting that a substantial proportion of women may still have inadequate access to diverse, nutrient-rich foods, potentially increasing their risk of micronutrient deficiencies and poor nutritional status (Arimond et al., 2016).

CONCLUSION

High food insecurity and low dietary diversity were reported among the female young adults surveyed. Food security was significantly associated with income and living arrangement. The most common coping strategies included relying on less preferred and cheaper foods, borrowing food or seeking assistance from relatives or friends, and reducing portion sizes or the number of daily meals. Some respondents also reported rationing money to purchase prepared food as a means of managing food shortages. A significant drawback of this study is the use of a single food security indicator. Hence, results of coping strategies may vary depending on the context or specific measurement tools used. The non-probability sampling approach may affect the

representativeness of our sample and limits the generalizability (external validity) of our findings to the broader population. Since the study employed a cross-sectional design, causal relationships between food insecurity and associated factors cannot be established; rather, the findings indicate associations at a single point in time. Furthermore, some information, including food security experiences and coping strategies, was self-reported, which may have introduced recall bias or social desirability bias. Future studies should incorporate multiple measures of food security, such as both experiential and quantitative indicators, to capture the multidimensional nature of food insecurity more accurately.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

ACKNOWLEDGEMENTS

The authors appreciate the female young adults in Ibadan North Local Government Area, Oyo state, who consented and provided data for this study.

ETHICAL CONSIDERATION

Ethical approval was obtained from the UI/UCH ethical committee, College of Medicine, University of Ibadan (ethical approval number: UI/EC/24/01036). Informed consent was sought from all respondents, and it was made clear that they had the right to withdraw from participation or skip any question they were not willing to answer without penalty.

REFERENCES

- Ariyo, O., Eyinla, T. E., Oladipo, D. A., Arulogun, T. W., Samuel, F. O., & Bola, K. F. Association Between Food Security and Women Empowerment Among Mothers Living in a Barrack in Ibadan.
- Ambali, O. I., Adewuyi, S. A., Babayanju, S. O., & Ibrahim, S. B. (2015). Expansion of rice for job initiative programme: Implications for household food security in Lagos State, Nigeria. *Advances in Economics and Business*, 3(3), 99–106.
- Anugwa, I. Q., & Agwu, A. E. (2016). Assessment of rural women's use of food security information in Bayelsa State, Nigeria. *Journal of Agricultural & Food Information*, 17(4), 246–259. <https://doi.org/10.1080/10496505.2016.1217779>
- Arimond, M., Ballard, T. J., Deitchler, M., Kennedy, G., & Martin-Prével, Y. (2016). *Minimum dietary diversity for women: A guide to measurement*. Food and Agriculture Organization of the United Nations.
- Ariyo, O., Akinyemi, J. O., Adeyemo, T., Oladiran, S., Shittu, O., Oyejobi, O., ... Samuel, F. O. (2025). Empowerment and minimum dietary diversity among women of reproductive age in Nigeria. *Global Social Welfare*, 1–12.
- Babatunde, R. O., Omotesho, O. A., & Sholotan, O. S. (2007). Socio-economic characteristics and food security status of farming households in Kwara State, North-Central Nigeria. *Pakistan Journal of Nutrition*, 6(1), 49–58.
- Banks, A. R., Bell, B. A., Ngendahimana, D., Embaye, M., Freedman, D. A., & Chisolm, D. J. (2021). Identification of factors related to food insecurity and the implications for social determinants of health screenings. *BMC Public Health*, 21, Article 1410. <https://doi.org/10.1186/s12889-021-11465-6>
- Belachew, T., Lindstrom, D., Hadley, C., Gebremariam, A., Kasahun, W., & Kolsteren, P. (2013). Food insecurity and linear growth of adolescents in Jimma Zone, Southwest Ethiopia. *Nutrition Journal*, 12, Article 55. <https://doi.org/10.1186/1475-2891-12-55>
- Blake, M. K. (2019). More than just food: Food insecurity and resilient place making through community self-organising. *Sustainability*, 11(10), Article 2942. <https://doi.org/10.3390/su11102942>
- Cafiero, C., Viviani, S., & Nord, M. (2018). Food security measurement in a global context: The Food Insecurity Experience Scale. *Measurement*, 116, 146–152. <https://doi.org/10.1016/j.measurement.2017.10.065>
- Chalerm Sri, C., Ziaei, S., Ekström, E. C., Muangpaisan, W., Aekplakorn, W., Satheanopakao, W., & Rahman, S. M. (2022). Dietary diversity associated with risk of cardiovascular diseases among community-dwelling older people: A national health examination survey from Thailand. *Frontiers in Nutrition*, 9, Article 1002066. <https://doi.org/10.3389/fnut.2022.1002066>
- Clapp, J., Moseley, W. G., Burlingame, B., & Termine, P. (2022). The case for a six-dimensional food security framework. *Food Policy*, 106, Article 102164. <https://doi.org/10.1016/j.foodpol.2021.102164>
- Drewnowski, A. (2010). The cost of US foods as related to their nutritive value. *The American Journal of Clinical Nutrition*, 92(5), 1181–1188. <https://doi.org/10.3945/ajcn.2010.29300>
- Egwue, O. L., Agbugba, I. K., & Mukaila, R. (2020). Assessment of rural households' food insecurity during COVID-19 pandemic in South-East Nigeria. *International Journal of Research - Granthaalayah*, 8(12), 182–194. <https://doi.org/10.29121/granthaalayah.v8.i12.2020.2713>
- Elgar, F. J., Pickett, W., Pfortner, T. K., Gariépy, G., Gordon, D., Georgiades, K., & Melgar-Quinonez, H. R. (2021). Relative food insecurity, mental health and wellbeing in 160 countries. *Social Science & Medicine*, 268, Article 113556.
- Elsahoryi, N., Al-Sayyed, H., Odeh, M., McGrattan, A., & Hammad, F. (2020). Effect of COVID-19 on food security: A cross-sectional survey. *Clinical Nutrition ESPEN*, 40, 171–178. <https://doi.org/10.1016/j.clnesp.2020.09.026>
- Elum, Z. A. (2021). Gender and poverty: Its influence on household food security in Africa. In *Gender equality* (pp. 399–411). Springer International Publishing. https://doi.org/10.1007/978-3-319-70060-1_121-1
- Emerson, J. A., Caulfield, L. E., Kishimata, E. M., Nzanu, J. P., & Doocy, S. (2020). Mental health symptoms and their relations with dietary diversity and nutritional status

- among mothers of young children in eastern Democratic Republic of the Congo. *BMC Public Health*, 20, Article 225. <https://doi.org/10.1186/s12889-019-8092-3>
- Food and Agriculture Organization of the United Nations, International Fund for Agricultural Development, United Nations Children's Fund, World Food Programme, & World Health Organization. (2024). The state of food security and nutrition in the world 2024: Financing to end hunger, food insecurity and malnutrition in all its forms. FAO. <https://doi.org/10.4060/cd1254en>
- Feskens, E. J. M., Bailey, R., Bhutta, Z., Biesalski, H. K., Eicher-Miller, H., Krämer, K., Pan, W. H., & Griffiths, J. C. (2022). Women's health: Optimal nutrition throughout the lifecycle. *European Journal of Nutrition*, 61(Suppl 1), 1–23. <https://doi.org/10.1007/s00394-022-02915-x>
- Gooding, H. C., Walls, C. E., & Richmond, T. K. (2012). Food insecurity and increased BMI in young adult women. *Obesity*, 20(9), 1896–1901. <https://doi.org/10.1038/oby.2011.233>
- Kassy, W. C., Ndu, A. C., Okeke, C. C., & Aniwađa, E. C. (2021). Food security status and factors affecting household food security in Enugu State, Nigeria. *Journal of Health Care for the Poor and Underserved*, 32(1), 565–581. <https://doi.org/10.1353/hpu.2021.0041>
- Kennedy, G., Ballard, T., & Dop, M. C. (2011). Guidelines for measuring household and individual dietary diversity. Food and Agriculture Organization of the United Nations. <https://openknowledge.fao.org/handle/20.500.14283/i1983e>
- Mbow, C., Rosenzweig, C., Barioni, L. G., Benton, T. G., Herrero, M., Krishnapillai, M., & et al. (2019). Food security. In *Climate change and land: An IPCC special report on climate change, desertification, land degradation, sustainable land management, food security, and greenhouse gas fluxes in terrestrial ecosystems*. Intergovernmental Panel on Climate Change. <https://hdl.handle.net/102.100.100/494856>
- Mukaila, R., Falola, A., & Omotesho, O. A. (2021). Food security status: Its drivers and coping strategies among vegetable farming households. *Cercetări Agronomice în Moldova*, 53(4), 414–425. <https://doi.org/10.46909/cerce-2020-035>
- Nicholson, C. F., Kopainsky, B., Stephens, E. C., Parsons, D., Jones, A. D., Garrett, J., & Phillips, E. L. (2020). Conceptual frameworks linking agriculture and food security. *Nature Food*, 1(9), 541–551. <https://doi.org/10.1038/s43016-020-00142-3>
- Obasan, T. A., Okojie, L. O., & Okuneye, P. A. (2017). *Determinants of rural households' food security in Ogun State, Nigeria* (No. 288341). Nigerian Association of Agricultural Economists.
- Offei-Ansah, C. (2012). Food habits and preferences as a factor in the choice of meals by students in the University of Cape Coast. *Nutrition and Health*, 21(3), 151–172. <https://doi.org/10.1177/0260106012467245>
- Oladijo, D. A., Akintimehin, O. O., & Samuel, F. O. (2025). Dietary diversity and food insecurity among medical students of the University of Ibadan: A cross-sectional study. *West African Journal of Medicine*, 42(3), 215–224.
- Owoo, N. S. (2018). Food insecurity and family structure in Nigeria. *SSM–Population Health*, 4, 117–125.
- Oyebanjo, O., Ambali, O. I., & Akerele, E. O. (2013). Determinants of food security status among rural farming households in Ijebu Division of Ogun State, Nigeria. *Journal of Agricultural Science and Environment*, 13(1), 92–103.
- Poorrezaeian, M., Siassi, F., Milajerdi, A., Qorbani, M., Karimi, J., Sohrabi-Kabi, R., & Sotoudeh, G. (2017). Depression is related to dietary diversity score in women: A cross-sectional study from a developing country. *Annals of General Psychiatry*, 16, Article 39.
- Rosier, K. (2011). *Food insecurity in Australia: Who experiences it and how can child and family services support families experiencing it?* Australian Institute of Family Studies.
- Samuel, F. O., Eyinla, T. E., Oluwaseun, A., Leshi, O. O., Brai, B., & Afolabi, W. (2021). Food access and experience of food insecurity in Nigerian households during the COVID-19 lockdown. *Food and Nutrition Sciences*, 12(11), 1062–1072. <https://doi.org/10.4236/fns.2021.1211078>
- Seligman, H. K., & Schillinger, D. (2010). Hunger and socioeconomic disparities in chronic disease. *The New England Journal of Medicine*, 363(1), 6–9. <https://doi.org/10.1056/NEJMp1003173>
- Shaun, M. M. A., Nizum, M. W. R., Shuvo, M. A., Fayeza, F., Faruk, M. O., Alam, M. F., ... Mali, S. K. (2023). Determinants of minimum dietary diversity of lactating mothers in rural northern region of Bangladesh: A community-based cross-sectional study. *Heliyon*, 9(1), Article e13020. <https://doi.org/10.1016/j.heliyon.2023.e13020>
- Sithole, S. T., & Dinbabo, M. F. (2016). Exploring youth migration and the food security nexus: Zimbabwean youths in Cape Town, South Africa. *African Human Mobility Review*, 2(2), 512–537.
- Snel, E., & Staring, R. (2001). Poverty, migration, and coping strategies: An introduction. *Focaal: European Journal of Anthropology*, 38, 7–22.
- Spees, C. K., Clark, J. E., Hooker, N. H., Watowicz, R. P., & Taylor, C. A. (2017). Dietary intake contributions by food source and food security status in U.S. adults. *Journal of Nutrition Education and Behavior*, 49(8), 667–673. <https://doi.org/10.1016/j.jneb.2017.01.009>
- United Nations General Assembly. (2015). *Transforming our world: The 2030 agenda for sustainable development*. United Nations. <https://sdgs.un.org/2030agenda>
- United Nations Children's Fund. (2023). *25 million Nigerians at high risk of food insecurity in 2023*. <https://www.unicef.org/press-releases/25-million-nigerians-high-risk-food-insecurity-2023>
- Wambogo, E. A., Ghattas, H., Leonard, K. L., & Sahyoun, N. R. (2018). Validity of the Food Insecurity Experience Scale for use in Sub-Saharan Africa and characteristics of food-insecure individuals. *Current Developments in Nutrition*, 2(9), Article nzy062. <https://doi.org/10.1093/cdn/nzy062>
- Yeneabat, T., Adugna, H., Asmamaw, T., Wubetu, M., Admas, M., Hailu, G., Bedaso, A., & Amare, T. (2019). Maternal dietary diversity and micronutrient adequacy during pregnancy and related factors in East Gojjam Zone, Northwest Ethiopia, 2016. *BMC Pregnancy and*

Childbirth, 19, Article 173.
<https://doi.org/10.1186/s12884-019-2299-2>