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ORIGINAL ARTICLE

PREVALENCE AND RISK FACTORS OF FOOD INSECURITY AMONG OLDER PERSONS IN ILORIN METROPOLIS, KWARA STATE, NIGERIA.

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Keywords

Food Insecurity,

Household,

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ABSTRACT

BACKGROUND: Older persons are more vulnerable to food insecurity due to factors such as retirement and loss of income, social isolation, inadequate social safety nets, and declining health status. This study assessed the prevalence, pattern, and risk factors of food insecurity among older persons in Ilorin metropolis, Nigeria.

METHODS: A cross-sectional study was conducted among 269 eligible respondents selected using a multistage sampling technique between May and November 2024. The study tool was adapted from the Household Food Insecurity Access Scale (HFIAS) and administered via electronic questionnaire. HFIAS consists of 9 questions, graded 0 to 3, to determine the presence of food insecurity. Data were analyzed using STATA 11.0. Descriptive and inferential analyses were conducted, and the level of significance was set at $p < 0.05$. Ethical approval was obtained.

RESULTS: Mean age was 71.0 ± 8.4 years. About 44% live in an urban setting, while more than two-thirds have fewer than six people per household. Most respondents (72.6%) earn less than 50,000 naira monthly. Most respondents (94.1%) were food insecure. Age ($p=0.015$) and place of residence ($p=0.008$) were significant risk factors associated with food insecurity. Age, place of residence, wealth index, number per household, average monthly income and BMI were predictors of food insecurity.

CONCLUSION: The study revealed high levels of food insecurity among older persons, indicating it's a multifactorial issue influenced by various socio-economic factors. These results underscore the need for targeted interventions that address identified risk factors among older adults.

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INTRODUCTION

According to the United Nations, an older person is defined as an individual aged 60 or older.¹ Older persons are variously referred to as the elderly, senior citizens, or the aged. Food insecurity remains a major global public health and developmental concern, disproportionately affecting vulnerable groups such as older adults. In Nigeria, food insecurity is one of the most pressing developmental challenges, exacerbated by economic instability, rising food prices, and social inequalities. It is defined as a condition in which *all people, at all times, have physical and economic access to sufficient, safe, and nutritious food that meets their dietary needs and food preferences for an active and healthy life*.¹ Conversely, food insecurity refers to a situation in which individuals or households lack consistent access to adequate, safe, and nutritious food, or have limited capacity to obtain such food in socially acceptable ways.² Older adults are more vulnerable to food insecurity due to factors such as retirement and loss of income, social isolation, inadequate social safety nets, and declining health status.³ They are particularly susceptible to nutritional deficiencies resulting from inadequate dietary intake or impaired nutrient metabolism due to ill health.⁴ These deficiencies may involve micronutrients, such as iron, or macronutrients, such as protein, and may occur in combination. Such conditions are further aggravated when older persons experience food insecurity. Globally, about 25% of older persons are malnourished, with a greater proportion residing in Sub-Saharan Africa.⁴ In addition, the risk of malnutrition is doubled, meaning that for every elderly person who is malnourished, two more are at risk of becoming malnourished.⁴ Factors perpetuating malnutrition in this age group also include a variety of social and economic challenges, as nutritional deficiencies have been shown to have an inverse relationship with the socio-demographic index.⁵ Globally, the population of older persons is increasing steadily. It is estimated that by 2050,

approximately 2 billion people will be aged 60 or older. In Africa, about 74 million people were older persons in 2020, and this figure is projected to exceed 200 million by 2050, a nearly 30% increase. Nigeria has the largest population of older persons in Africa and ranks 19th globally in terms of its geriatric population. Currently, about 6 million Nigerians (2.8%) are older persons, and this number is expected to rise to 16 million (4.0%) by 2050.⁶ With this rising demographic trend comes an increasing need to understand the unique health and social challenges faced by older persons. Meeting their nutritional needs is essential, and this largely depends on access to adequate and nutritious food. Food security among older persons, therefore, plays a critical role in promoting healthy ageing and improving quality of life.⁷ Furthermore, the absence of an effective national policy on ageing in Nigeria^{3,8} coupled with the ongoing shift from the traditional extended family system, which historically provided strong social support for older persons, to a predominantly nuclear family structure, has reduced the availability of care for older adults. These challenges are compounded by hyper-inflation in food prices, insecurity and civil unrest that disrupt agricultural activities, and broader economic instability. Collectively, these factors underscore the need for robust, context-specific research to generate local evidence on the burden and determinants of food insecurity among older persons. Such data are vital for informing policy development and implementing interventions that enhance food security and promote healthy ageing in Nigeria. The study therefore assessed prevalence, pattern and risk factors of food insecurity among older persons in Ilorin, Kwara State, Nigeria.

METHODS

This study adopted a community-based cross-sectional analytical design and was conducted among older persons resident in Ilorin metropolis, Kwara State, Nigeria. Kwara State lies within the North-Central geopolitical zone and comprises 16 Local Government Areas (LGAs).

Table IA: Socio-demographic Characteristics

Variable	Frequency (N=269)	Percentage (100%)
Age in years		
<65	54	20.07
≥65	215	79.93
Mean Age ± SD	71.0 ± 8.35	Range = 60-96
Religion		
Islam	214	79.56
Christianity	55	20.44
Gender		
Male	104	38.66
Female	165	61.34
Community type		
Peri-urban	149	55.39
Urban	120	44.61
Tribe		
Yoruba	256	95.16
Hausa	5	1.86
Igbo	4	1.49
Other	4	1.49
Occupation		
Civil servant	10	3.72
Artisan	33	12.27
Trader	120	44.61
Retired/Unemployed	72	26.77
Farmer	8	2.97
Others	26	9.67
Marital status		
Single	2	0.74
Married	151	56.13
Divorced	7	2.61
Widowed	109	40.52
Education status		
None	148	55.02
Primary	57	21.19
Secondary	40	14.87
Tertiary	24	8.92

Ilorin, the state capital, is a major urban centre with diverse socio-economic activities and health facilities, including the University of Ilorin Teaching Hospital, Kwara State University Teaching Hospital and several secondary health centres. The study population consisted of individuals aged 60 years and older who had resided in the Ilorin metropolis for at least 6 months. Those who were critically ill, cognitively impaired, or temporary residents were excluded. Verbal informed consent was obtained from all participants after the study objectives and the

voluntary nature of participation were explained. The minimum sample size was calculated using Fisher's formula for a single proportion, assuming a prevalence of 81%⁹, a 95% confidence level, and a 5% margin of error. This yielded a sample size of approximately 240, adjusted for a 10% non-response rate, resulting in a target of approximately 269 respondents. A multistage sampling technique was adopted for the study. In the first stage, two LGAs (one urban and one rural) were randomly selected from Kwara State.

Table 1B: Socio-demographic Characteristics

Variable	Frequency (N=269)	Percentage (100%)
Household wealth index		
Average ≤ 18	105	39.03
Richer > 18	164	60.97
Number in Household		
< 6	188	69.89
> 6	81	30.11
Mean Household No $\pm$ SD	5.74 $\pm$ 3.31	
Monthly income		
$< \text{₦}70000$	236	87.73
$\geq \text{₦}70000$	33	12.27
Mean Income (₦34000)		
Health Insurance		
Covered	25	9.29
Not covered	244	90.71
Source Insurance (n=25)		
Private	12	48.00
Public	8	32.00
Others	5	20.00
Engaged in Farming		
Yes	69	25.65
No	200	74.35
Type of farming (n=69)		
Home (garden)	30	43.47
Large scale	4	5.80
Small scale	34	49.28
Others	1	1.45

In the second stage, two wards were selected from each chosen LGA using simple random sampling. Subsequently, one community was randomly selected from each ward. In the fourth stage, households in the selected communities were sampled using systematic sampling with a predetermined sampling interval.

The sampling interval (k) was calculated using $k = N/n$, where N represents the estimated total number of households within the selected communities (approximately 800 households) and n represents the required sample size (269). Thus, $k = 800/269 \approx 3$. The first household was selected by simple random sampling (random start), after which every third household ($k=3$) was subsequently recruited. Within each selected household, all eligible older persons were identified, and those who provided informed consent were enrolled until the required sample size was attained. Data were collected using a semi-structured, interviewer-administered questionnaire.

The instrument captured socio-demographic characteristics, household food insecurity and anthropometric measurements. Food insecurity was assessed using the Household Food Insecurity Access Scale (HFIAS)¹, which comprises 9 items scored from 0 (never) to 3 (often). Responses were summed to generate a total score ranging from 0 to 27, and households were classified as food secure (score = 0), mildly insecure (1–7), moderately insecure (8–14), or severely insecure (15–27). For regression analysis, food insecurity was dichotomized into secure (score = 0) and insecure (score ≥ 1). Anthropometric measurements were taken according to standard WHO protocols, and body mass index (BMI) was calculated. The wealth index was derived using principal component analysis of household assets. Data analysis was performed using STATA version 11.0. Descriptive statistics were used to summarize socio-demographic characteristics and prevalence estimates.

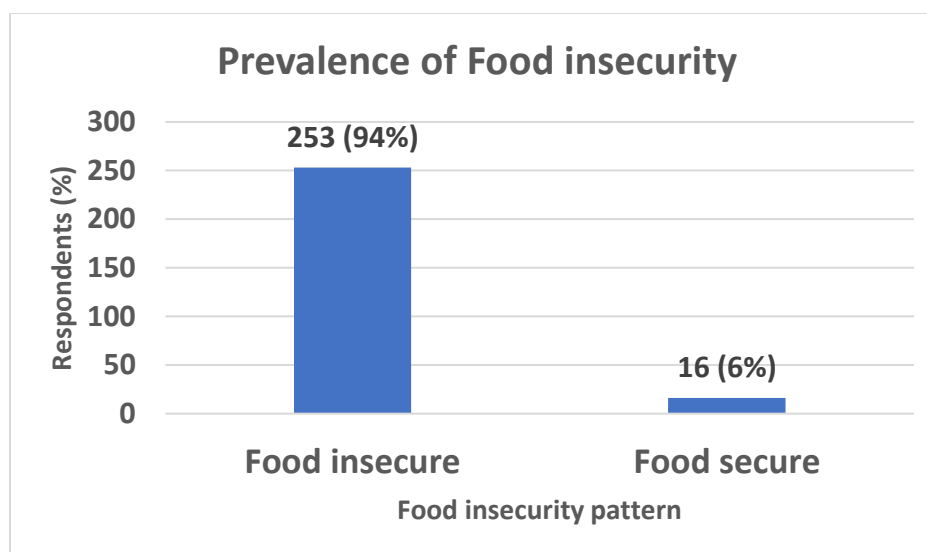


Figure I: Food Security of respondents

Associations between categorical variables were assessed using Chi-square tests, and Binary logistic regression was used to identify predictors of food insecurity. Results were expressed as adjusted odds ratios (aOR) with 95% confidence intervals, and Statistical significance was set at $p < 0.05$.

Ethical approval was obtained from the Kwara State Ministry of Health Ethical Review Committee (approval ID-ERC/MOH/2024/05/303). Permission was also secured from community leaders. Participation was voluntary, and confidentiality was maintained. No personal identifiers were collected, and participants were informed of their right to withdraw at any time without consequence.

RESULTS

The study included 269 participants with a mean age of 71.0 ± 8.4 years; most (79.9%) were 65 years or older, female (61.3%), Muslim (79.6%), and lived in peri-urban areas (55.4%). The majority were Yoruba (95.2%), mainly traders (44.6%), and over half were married (56.1%) or widowed (40.5%). More than half (55.0%) had no formal education. Most participants were classified as “richer” (55.4%), with an average wealth score of 19.4 ± 2.8 , and lived in households with an average

of 5.7 ± 3.3 members. Most participants (72.7%) earned less than ₦50,000 per month (mean income: ₦34,000). Only 9.3% had health insurance, and just 25.7% engaged in farming, largely on a small scale (49.3%) or backyard basis (43.5%). Table 2 shows that out of the 269 participants, 93 (34.6%) were aware of health insurance. Approximately half (48.9%) of whom got their information from the media. Nearly half of the respondents (48.7%) have not utilized health care services in the last three months. The average weight was 61.3 ± 14.2 kg, with a range of 33.7-123.4kg. Average height was 1.6 ± 0.1 m at a spread of 1.3m to 1.8m. About 10.4% were underweight, 50.2% were normal weight, 27.9% were overweight, 10.4% were obese, while only 1.1% were morbidly obese; with a mean of BMI of 24.2 ± 5.1 kg/m² (range of 14.3kg/m² to 47kg/m²). Tables 3 and Figure I depict Household Food Insecurity. Among the 269 participants, 253 (94%) were food insecure, while only 16 (6%) were Food Secured (average score of 14.8 ± 7.6).

In Table 4, age was a significant factor of household food insecurity ($p = 0.015$), with a higher proportion of participants aged above 65 years (95.8%) experiencing food insecurity compared to 87.0% of those below 65 years.

Table 2: Awareness of respondents about Health Insurance and Utilization & Anthropometry measurement

Variable	Frequency (N=269)	Percentage (100%)
Awareness of Insurance		
Yes	93	34.57
No	176	65.43
Sources of information (n=93)		
Family/friends	13	13.98
Hospital	24	25.80
Media	45	48.39
Others	11	11.83
Mean weight $\pm$ SD	61.3 $\pm$ 14.2	Range = 33.7 – 123.4
Mean Height $\pm$ SD	1.6 $\pm$ 0.1	Range = 1.3 – 1.8
BMI		
<18.5	28	10.41
18.5-24.9	135	50.19
25-29.9	75	27.88
30-39.9	28	10.41
≥ 40	3	1.11
Mean BMI $\pm$ SD	24.21 $\pm$ 5.09	Range = 14.34 – 47.02
BMI		
Normal	135	50.19
Abnormal	134	49.81
Underweight	28	10.41
Overweight	75	27.88
Obese	28	10.41
Morbid Obese	3	1.11

Place of residence was also significantly associated with food insecurity ($p = 0.008$), with nearly all urban residents (98.3%) reporting food insecurity, indicating that both advanced age and urban living are key determinants of food insecurity in this population. Age and BMI were predictors of food insecurity, with p -values of 0.020 and 0.012, respectively (Table 5). Table 5 and Figures II and III show that wealth index, income, number of people in the household, weight, BMI, and age were independent predictors of Food Insecurity. To compare the relative strength of these independent variables within the same regression model, a beta test was conducted, with the following order of decreasing strength: Wealth Index-21 % > Income-20.8% > Number-in-Household-18.7% > Weight-12.7% > BMI-10% > Age-7.6%.

DISCUSSION

The findings of this study corroborate previous research indicating that food insecurity among older populations is a multifaceted problem influenced by various socio-economic determinants. The majority of respondents were not

enrolled in any form of health insurance. This contrasts sharply with findings from the United States, where 93.6% of older adults reportedly had more than one type of health insurance.¹⁰

The low level of insurance coverage observed in this study likely increases out-of-pocket healthcare expenditures, thereby reducing disposable income available for food and worsening household food insecurity. The socio-demographic and economic characteristics identified in this study are comparable to findings from research conducted among older adults in Ilaro, Ogun State, Nigeria.¹¹ The predominance of low socioeconomic status in both settings suggests a persistent vulnerability among older persons, which may negatively affect their quality of life and food security status. Regarding food access experiences, a small proportion of respondents reported no anxiety or uncertainty about household food supply, while approximately one-third indicated that they had compromised their food preferences due to financial constraints. These proportions are higher than those reported in a Polish study, where 28.7%

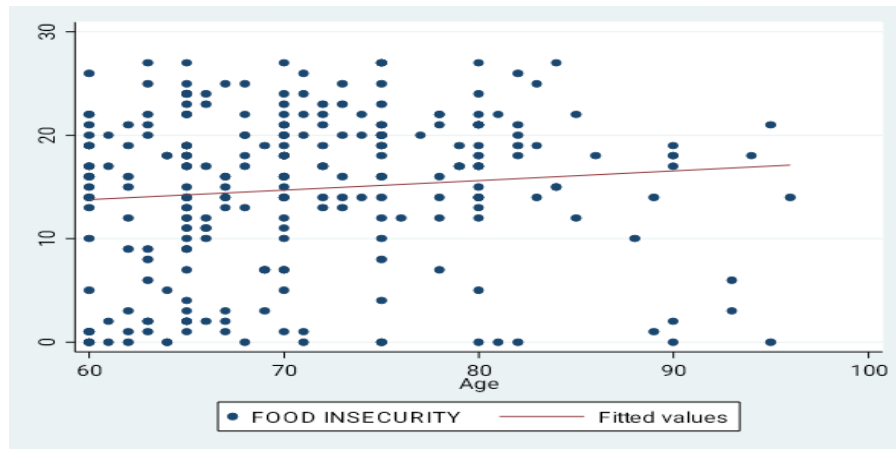


Figure II: Regression line graph age fitted for food insecurity. Food insecurity=8.26+0.09*Age

(For each one-point increase in Age, Food insecurity increases by 0.09)

expressed concern about food availability and about 24.0% modified their food consumption due to financial difficulties.¹² The overall prevalence of food insecurity in this study was 94.1%, with nearly two-thirds experiencing severe food insecurity. This is considerably higher than findings from an American survey, which reported 13.6% marginal food insecurity among older adults.¹⁰ In South-West Nigeria, one study reported that 19.0% of households were food insecure,¹³ while another found that approximately half were food insecure, with only 2.5% experiencing severe food insecurity.¹⁴ Similarly, a study conducted in Ilaro, Ogun State, Nigeria documented that 25.0% of older adults were food secure, 21.8% mildly food insecure, 41.8% moderately food insecure, and 11.4% severely food insecure.¹¹ Food insecurity was also found to be 60% among cassava farmers in Oyo state with level of education and number of household and age significantly influencing food insecurity among the respondents.¹⁵ A study in South-West on determinants of food insecurity among smallholder farming household also reported similar pattern of food insecurity as 61.44% of the households were severely food insecure, 35.73% were moderately food insecure while 1.80% and 1.03% were food secured and mildly food insecure.¹⁵ Significant factors related to

food insecurity among the farming households were age, education, family size, adoption of technology, farm income, association membership, engagement in non-farm activities, and access to credit.¹⁶ The findings from this study are also similar to a study from South-East Nigeria, where a high level of household food insecurity in Nsukka Local Government Area was reported at 82.6%, with 60.3% of households severely food insecure, 13.3% mildly food insecure, and 9% moderately food insecure.¹⁷ A systematic review of food insecurity in Nigeria further demonstrated wide variability, with prevalence ranging from 12% to 100%.^{15, 18} The markedly higher prevalence observed in the present study may reflect recent economic challenges, including rising food prices and currency devaluation. Age was significantly associated with food insecurity, consistent with findings from the Canadian Community Health Survey, which shows that certain age categories of older persons were particularly vulnerable to food insecurity.^{16, 19} Additionally, residential location was associated with food security status. Although fewer than half of respondents resided in urban areas, a higher proportion of urban dwellers experienced food insecurity than those in peri-urban areas, where communal food-sharing practices may provide informal social protection.

Table 3: Household Food Insecurity

Household Food Insecurity In the last 4 weeks	No (%)	Rarely (%)	Sometimes (%)	Often (%)
Anxiety and uncertainty about household food supplies				
1. Worry household would not have enough food (n=269)	36 (13.38)	37 (13.75)	104 (38.66)	92 (34.20)
Insufficient quantity (including food varieties and preferences)				
2. Not able to eat the kinds of foods preferred because of a lack of resources (n=266)	38 (14.29)	20 (7.52)	104 (39.10)	104 (39.10)
3. Have to eat a limited variety of food due to a lack of resources (n=268)	37 (13.81)	19 (7.09)	105 (39.18)	107 (39.93)
4. Have to eat some foods not wanted to eat because of a lack of resources to obtain other types of food (n=267)	38 (14.23)	23 (8.61)	108 (40.45)	98 (36.70)
Insufficient food intake and physical consequences				
5. Have to eat a smaller meal than felt needed because there was not enough food (n=268)	47 (17.54)	19 (7.09)	104 (38.81)	98 (36.57)
6. Have to eat fewer meals in a day because there was not enough food (n=265)	50 (18.87)	20 (7.55)	109 (41.13)	86 (32.45)
7. No food of any kind to eat because of lack of resources to get food (n=268)	62 (23.13)	54 (20.15)	107 (39.93)	45 (16.79)
8. Go to sleep at night hungry because there was not enough food (n=268)	115 (42.91)	63 (23.51)	67 (25.00)	23 (8.58)
9. Go a whole day & night without eating anything because there was not enough food (n=266)	160 (60.15)	66 (24.81)	30 (11.28)	10 (3.76)
Household Food Insecurity	Frequency (N=269)		Percentage (100%)	
Food Insecurity				
No Food Insecurity (Food secured)– Score 0	16 39		5.95 14.50	
Mild Food Insecurity – 1-7	56		20.82	
Moderate Food Insecurity - 8-14	158		58.74	
Severe Food Insecurity - 15-27	14.8±7.6		Range = 0-27	
Mean FI ± SD				

This finding aligns with previous research demonstrating that place of residence and household composition significantly influence perceptions and experiences of food insecurity.¹² Similarly, a Nigerian study reported that under-five children living in urban slums were significantly more likely to experience household food insecurity compared to their rural counterparts.¹³ Furthermore, this study found that increasing

household size significantly increased the likelihood of food insecurity. This finding is consistent with other Nigerian studies showing that larger household size, the number of dependent children, and the presence of a disabled older adult were significantly associated with higher levels of household food insecurity.^{17, 20}

The study acknowledges certain limitations.

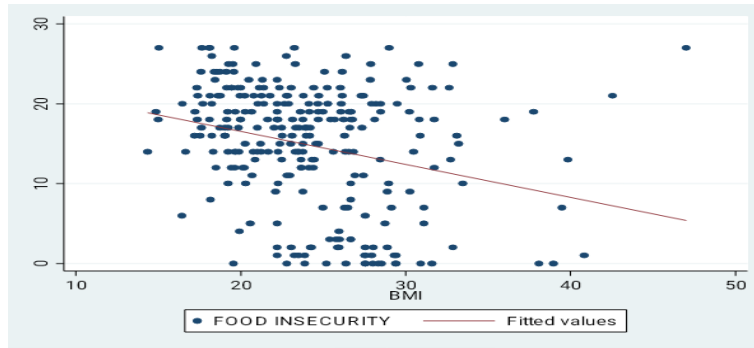


Figure III: Regression line graph BMI fitted for food insecurity. Food insecurity = $24.83 - 0.41 \times \text{BMI}$
 (For each one-point increase in BMI, Food insecurity significantly decreases by 0.4)

Its cross-sectional design precludes causal inference, and reliance on self-reported data may introduce recall and social desirability bias.

CONCLUSIONS

HFIAS tools showed a high prevalence of Household Food insecurity, and some important associated risk factors such as Household wealth index, income, number in household, BMI, and age were identified as predictors of Food Insecurity among the elderly. These findings corroborate previous studies that demonstrate that food insecurity among older persons is a complex phenomenon influenced by diverse socio-economic factors. It is recommended that financial social programs, social education of families, provision of food vouchers and living stipends, nutritional literacy, subsidization of food, and engaging the older persons in income-generating works could enhance food security and the overall health status of older persons in the community. It is also necessary to embrace and further investigate an integrated approach that accounts for other contextual socioeconomic dynamics of food insecurity in Nigeria.

CONFLICT OF INTEREST

None to declare

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Nil

AUTHORS' CONTRIBUTIONS

AIS: Study conception, Study design supervision, revising the study critically for important intellectual content, final approval of the version to be published.

IET: Drafting the work, data collection, data analysis, interpretation and manuscript writing.

KTG: Drafting the work, data collection, interpretation and manuscript writing.

AMO: Drafting the work, data collection, interpretation and manuscript writing.

JTG: Drafting the work, data collection, interpretation and manuscript writing.

DLO: Drafting the work, data collection, interpretation and manuscript writing.

OFT: Drafting the work, data collection, interpretation and manuscript writing.

Table 4A: Factors associated with Food insecurity among older persons in Kwara State Nigeria

Variable	Food insecurity			χ^2	p-value
	Food in-secure 253 (94.04%)	Food secure 16 (5.95%)	Total 269 (100%)		
Age in years					
<65	47 (87.04)	7 (12.96)	54	5.94	0.015
≥65	206 (95.81)	9 (4.19)	215		
Gender					
Male	154 (93.33)	11 (6.67)	165	0.39	0.530
Female	99 (95.19)	5 (4.81)	104		
Religion					
Christianity	49 (90.74)	5 (9.26)	54	1.371	*0.370
Islam	203 (94.86)	11 (5.14)	214		
Others	1 (100)	0 (0.00)	1		
Marital status					
Divorced/separated	7 (100)	0 (0.00)	7	0.613	0.893
Married	142 (94.04)	9 (5.96)	151		
Single	2 (100)	0 (0.00)	2		
Widowed	102 (93.58)	7 (6.42)	109		
Education status					
None	138 (93.24)	10 (6.76)	148	3.275	0.351
Primary	56 (98.25)	1 (1.75)	57		
Secondary	36 (90.00)	4 (10.00)	40		
Tertiary	23 (95.83)	1 (4.17)	24		
Occupation					
Artisans	31 (93.94)	2 (6.06)	33	2.981	*0.714
Civil servant	9 (90.00)	1 (10.00)	10		
Farming	8 (100.00)	0 (0.00)	8		
Trader	111 (92.50)	0 (0.00)	26		
Unemployed/retired	68 (94.44)	9 (7.50)	120		
	26 (100.00)	4 (5.56)	72		
Others					

***Yate correction**

Each of the authors confirms that this manuscript has not been previously published and is not currently under consideration by any other journal. Additionally, all authors have approved the

contents of this paper and have agreed to the Journal of Community Medicine and Primary Health Care's submission policies. This work has been read and approved by all the authors

Table 4B: Factors associated with Food insecurity among older persons in Kwara State Nigeria

Variable	Food in-secure 253 (%)	Food insecurity Food secure 16 (%)	Total 269 (100%)	χ^2	p-value
Household wealth index					
Third (Average)	101 (96.19)	4 (3.81)	105	2.476	*0.206
Fourth (Richer)	139 (93.29)	10 (6.71)	149		
Fifth (Richest)	13 (86.67)	2 (13.33)	15		
Household wealth index					
Average	101 (96.19)	4 (3.81)	105	1.408	*0.297
Rich	152 (92.68)	12 (7.32)	164		
Number in Household					
<6	174 (93.05)	13 (6.95)	187	1.105	*0.405
>6	79 (96.34)	3 (3.66)	82		
Monthly income					
<1\$	186 (94.90)	10 (5.10)	196	0.924	0.336
≥1\$	67 (91.78)	6 (8.22)	73		
Monthly income					
<70000	223 (94.49)	13 (5.51)	236	0.664	*0.423
>70000	30 (90.91)	3 (0.09)	33		
Community type					
Peri-urban	135 (90.60)	14 (9.40)	149	7.098	0.008
Urban	118 (98.33)	2 (1.67)	120		
Health Insurance					
Covered	230 (94.26)	14 (5.74)	244	0.208	*0.450
Not covered	23 (92.00)	2 (8.00)	25		

*Yate correction

Table 5: Predictors of food insecurity in households among older persons in Kwara State

Variable	Unadjusted Logistic Regression			Adjusted Logistic Regression		
	OR	95% CI	p-value	OR	95% CI	p-value
Age in years						
<65 (Reference)						
≥65	0.2933	0.1039-0.8277	0.020	0.3217	0.1053-0.9831	0.049
Household wealth index						
Average (Reference)						
Rich	1.8165	0.5540-5.9563	0.325	0.9178	0.2554-3.2985	0.895
Richer	3.8846	0.5540-5.9563	0.138	1.4941	0.2085-10.7096	0.689
No in Household						
<6 (Reference)						
>6	0.4526	0.1151-1.7799	0.301	0.5083	0.1409-1.8340	0.242
Monthly income						
<1USD (Reference)						
>1USD	1.6657	0.5829-4.7596	0.341	1.1909	0.2837-4.9995	0.811
BMI						
Underweight (Reference)						
Normal	0.1364	0.0287-0.6482	0.012	0.1304	0.0265-0.6424	
Overweight	0.8182	0.2304-2.9049	0.756	0.7035	0.1861-2.6601	0.012

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