Household Food Insecurity and Dietary Diversity Among Women in Ibadan South West Local Government Area, Oyo State, Nigeria

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Abstract
Background: *Optimal nutrition plays a crucial role in both population well-being and development of a nation; its implication should not be underrated. This study was conducted to assess the household food security (HFI) level and dietary diversity among women in selected households of Ibadan, South-Western Nigeria.*
Materials and Methods: *The study was cross-sectional design and 393 apparently healthy women were selected using multi-stage sampling techniques. An interviewer-administered questionnaire was used to collect data on the socio-demographic variables, household food insecurity levels and dietary diversity of the respondents. Household food insecurity and dietary diversity of the respondents were assessed using standardized measures namely Household Food Insecurity and Access Scale (HFIAS) and household dietary diversity guide respectively. Data were obtained and analysed using SPSS version 21 and summarized using descriptive statistics such as frequencies, means and percentages.*
Results: *The mean age of the respondents was 30 years. One third of the women were artisans (30.0%). Household food security status showed that 28.2%, 48.6%, 12.7% and 10.5% of the respondents were food secure, mildly, and moderately and severely food insecure respectively The respondents had their dietary diversity score at the low (21.1%), medium (56.7%) and high levels (22.2%) respectively. Overall, the starchy staples food group 99.4% was mostly consumed, more than two-third of the respondents consumed beans and other legumes while nuts and seeds were consumed by more than half of them (54.1%).*
Conclusion: *This study found a high prevalence of household food insecurity and low dietary diversity among women. It is therefore recommended that strategies targeted at improving nutrition education and empowerment among women should be promoted to improve their diet and household food security levels.*
Keywords: *Dietary diversity, Household Food insecurity, Women, Diet*

I.   Introduction

Food insecurity remains a critical and global issue affecting several millions of individuals, particularly vulnerable populations[1]. Being food secured 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[2]. Food insecurity is an important cause of morbidity and mortality, especially among vulnerable populations including women[3]. 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[4]. It is also strongly connected with 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[5]. 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[6].

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[7]. This is because the country was still trying to recover from the effects of economic recession in 2016 when another recession hit in 2020 due to the effects of the COVID-19 pandemic, further disrupting its economic recovery. This further increased household insecurity levels as reported by the Nigeria

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Bureau of Statistics that about 63% of Nigerians which resulted from lack of access to health, education, living standard, employment and security.

The Household Dietary Diversity Score (HDDS) measures the total number of food groups consumed in the past 24hours by a household member, including foods prepared at home but eaten away[8]. Dietary diversity is a measure of individual/household food access to provide an overview of the food and nutrition security status in a community[9]. It is an appropriate proxy that provides insights into the consumption of a wide variety of foods represented in a woman's diet[10]

Women constitute over 60% of the people living in poverty in Nigeria[11] and going by the International Monetary Fund statistics reported that Nigeria has approximately 52 million women experiencing extreme poverty. Despite the fact that women play important role and contribute positively to the growth of homes, communities and national development at large; studies have shown that a large number of them are mostly affected by poverty and are often deprived in many ways[12,13]

With recent economic hardships experienced in developing countries, this is likely to have a great effect on how household can vary their diet and ensure food security especially among women. The household dietary diversity score (HDDS) is intended to depict at a glance the economic ability of a household to have a variety of foods while individual dietary diversity scores are intended to reflect nutrient adequacy[9].

Dietary diversity as a measure of household food access and food consumption can be combined with other food-related information to in order to bring about an all-inclusive picture of the food and nutrition security status in a community[9]. Several studies have assessed the household food security and dietary diversity among household levels in Nigeria[14, 15,16 ,17] but very few have laid emphasis on women of reproductive age based on location density in urban areas. This paper will therefore assess dietary diversity levels and level of food security among women in Ibadan South West Local Government Area. The result will assist policy makers in formulating policies and programs that are more specific to women and will help to improve the level of food security among them and their households.

II. Materials and Methods

This is a descriptive cross-sectional study conducted in Ibadan South West Local Government Area in Ibadan, Oyo State. Ibadan is the largest and capital city of Oyo state. It is one of the South-Western states in Nigeria. It is referred to be the largest city in Africa. It is located between latitudes 7° 25' and 7° 45' N and longitudes 3° 40' and 3° 70' E and shares borders with the states of Osun and Ondo states. It has a land mass of about 244,55km square.

Subject and Selection Methods: The study participants were households with women living in Ibadan South West Local Government Area of Oyo State.

A three-stage sampling procedure was employed in selecting women for the study. Ibadan South West Local Government Area was purposively selected out of the 33 local Government Areas of Oyo state due to its unique characteristics of having different density groupings of high, medium and low density location according to the National Population Commission groupings. A list of the 12 wards in the Ibadan South West Local Government Area was drawn and stratified into high, medium and low density areas. Three wards (one from high, medium and low density areas) were selected using the simple random technique of sampling and then one community from each of the three wards selected. The list of women in the selected study communities was obtained from the National Population Commission (NPC) of the three different communities. Using systematic sampling, every fifth women in each of the three selected communities were chosen for the study. In the case of non-availability of woman in a selected household, the next household was selected to replace it. Three hundred and ninety-three women were randomly selected from the communities.

Procedure methodology: A semi-structured interviewer-administered questionnaire was used for data collection. The questionnaire contained three main sections which assessed the respondent's socio-demographic characteristics, household food security status and dietary diversity using 24-hour dietary recall. The Household Food insecurity was assessed using the 9-item Household Food Insecurity Access Scale (HFIAS) for estimating the prevalence of food security in the United States of America. The questions contained in the Household Food Insecurity Access Scale (HFIAS) were asked with a recall period of 12 months. The respondent was first asked an occurrence question, i.e. whether the condition in the question happened at all in the past 52 weeks (with the provision of 'yes' or 'no' response) and if it was, then with what frequency (rarely, sometimes or often). The resulting responses can be transformed into either a continuous categorical indicator of food security. When calculating the HFIAS as a continuous indicator, each of the nine questions are scored 0-3, with 3 been the highest frequency of occurrence and the scores for each is added together. The total HFIAS can range from 0 to 27, indicating the degree of insecure food access. The

households are further categorized as food secure, mildly food insecure, moderately food insecure and severely food insecure. The constituents of household food insecurity categories are shown in table 1.

Table 1: Categories of Household food insecurity Categories

Categories of Household food security	Conditions experienced
Food secure	when the members of an household 'rarely' in the past 12 months, worried about not having enough food and had replied 'no' to question number 2 to 9.
Mildly food insecure	The members of the household in the last 12 months were worried about not having enough food sometimes or often, and/or were unable to eat preferred foods, and/or ate a more monotonous diet than desired, and/or ate some foods considered undesirable but only rarely
Moderately food insecure	The household members in the last 12 months sacrificed quality more frequently by eating a monotonous diet or undesirable foods sometimes or often, and/or had started to cut back on quantity by reducing the size of meals or number of meals, rarely or sometimes.
Severely food insecure	The individuals in the household in the last 12 months had to cut back on meal size or number of meals often, and/or experienced any of the three most severe conditions (running out of food, going to bed hungry, or going a whole day and night without eating).

24-hour dietary recall
The dietary recall was obtained using the 24-hour dietary recall method. The women were asked to recall all the food and drinks consumed either during the day and by night in the past 24hours. This was used to assess the Minimum Dietary Diversity for Women of Reproductive Age (MDD-W) with 10 food groups for women. Foods were categorized into 10 groups based on FAO in (2021)[18] guidelines for the women as follows (i) All starchy foods, (ii) Beans and other legumes, (iii) other Vitamin A rich fruits and vegetables, (iv) fleshy foods (meat, fish, poultry and liver/organ meats), (v) eggs, (vi) other vegetables, (vii) other fruits, (viii) dairy (ix) oil and fats and (x) nuts and seeds. The response categories were 'Yes' if at least two food items in a group were consumed and this was scored one point. Dietary Diversity was obtained by summing the number food groups consumed in each group. The total score was calculated and this ranged from 0-10. Terciles of DDS were used to classify the women into groups of low (≤ 4), medium (5-8) and high (9-10).

Statistical Analysis
Data were obtained and analysed using SPSS version 21 and summarized using descriptive statistics such as frequencies, means and percentages. The chi-square test for independence was used to determine the significance of the association between the food security categories and socio-economic factors.

Ethical Consideration
The study protocol was approved by the Joint Ethical Review Committee of the University of Ibadan and University College Hospital, Ibadan with the approval number UI/EC/17/0200. Also, the permission to conduct research in the Local Government Area was also obtained from the Chief Medical Officer in Ibadan South West Local Government Area. Informed consent was sought from the participants throughout the period of data collection of this study.

III. Results

The mean age of the women was 30.8 years. Majority of the respondents (72.8%) were of Yoruba origin while only 27.2% of them were migrants in the urban communities. More than half of the respondents were Muslims (53.9%). Most of the women (93.1%) were married, about one third of the respondents were artisans (30.0%), traders (26.5%) and few farmers (3.1%) in the three communities as shown in table 2. More than half (52.2%) completed secondary school while only a third (30%) of the respondents had degree qualifications.

Table 2: Socio-economic characteristics of respondents

Characteristics	High (139)	Medium (134)	Low (120)	Total (393)	p
Ethnic group					
Yoruba	84(60.4)	98(73.1)	104(86.7)	286(72.8)	
Igbo	34(24.5)	19(14.2)	10(8.3)	63(16.0)	.000
Hausa	20(14.4)	10(7.5)	0(0)	30(7.6)	
Others	1(0.7)	7(5.2)	6(5.0)	14(3.6)	
Religion					
Christianity	21(15.1)	59(44.0)	38(31.7)	118(30.0)	
Islam	98(70.5)	55(41.0)	59(42.9)	212(53.9)	.000

Others	20(14.4)	20(14.9)	23(19.2)	63(16.0)	
Marital status					
Married	126(90.4)	123(91.5)	131(97.5)	366(93.1)	
Single	7(5.2)	7(5.5)	2(1.7)	16(4.1)	.004
Divorced	6(4.4)	4(3.0)	1(0.8)	11(2.8)	
Occupation					
Civil servant	8(5.8)	19(14.2)	32(26.5)	59(15.0)	
Private-company worker	12(10.1)	14(10.4)	34(28.3)	60(15.3)	
Farming	2(1.4)	9(6.4)	0(0.0)	12(3.1)	.001
Trading	47(33.8)	23(17.2)	33(27.5)	103(26.5)	
Artisan	42(33.1)	54(40.3)	18(15.0)	118(30.0)	
Teaching	14(10.1)	11(8.2)	1(0.8)	26(6.6)	
Others	10(7.2)	4(3.0)	1(0.8)	15(3.8)	
Education					
No education	1(0.7)	3(2.2)	0(0.0)	4(1.0)	
Incomplete primary	11(7.9)	6 (4.5)	0(0.0)	17(4.3)	
Completed primary	16(11.5)	10 (7.5)	1(0.8)	27(6.9)	.000
Incomplete secondary	2(1.4)	3(2.2)	4(3.3)	9(2.3)	
Completed Secondary	96(69.1)	69(51.5)	40(33.3)	205(52.2)	
Degree	11(7.9)	38(28.4)	69(57.6)	118(30.0)	
Others	2(1.4)	5(3.7)	6(5.0)	13(3.3)	

Household Food Insecurity among the respondents

Above a third (50.4%) of the respondents were worried they would run out of food because of lack of money and most of them were from the high density location as shown in Figure 1. Among the respondents in the high, medium and low density locations; (61.9%, 41.0%, and 26.6%) were unable to eat healthy foods, (58.2%, 39.5%, and 23.2%) ate only few kinds of foods and (68.3%, 53.7%, and 18.3%) skipped meal because of lack of money respectively. About 53.2% ate less than they should and lived in the high density area. About 26.6% ran out of food because of lack of money in the low density area. About 58.2% were hungry and did not eat because they did not have enough money in the high density area while only 17.9% went without eating for a whole day because of lack of money.
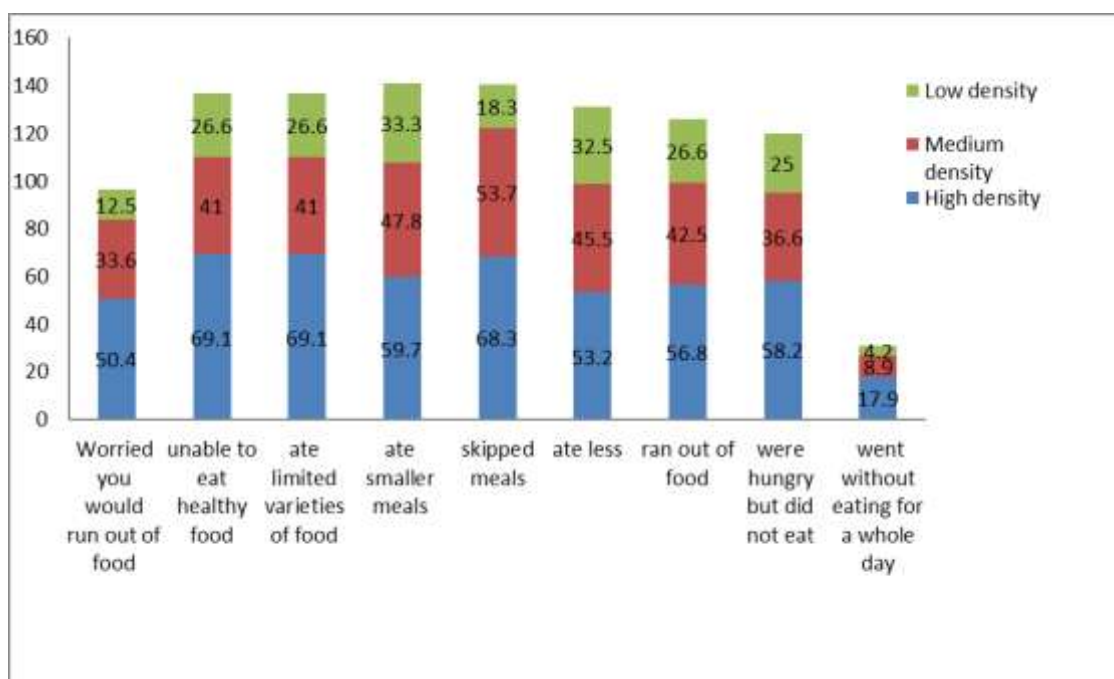

Figure 1: Food insecurity among the Respondents

Household Food Insecurity Categories of Respondents

In the high density area, only 6.9% were food secured, 19.8% were mildly food insecure 5.1% were moderately food insecure, while only 4.9% of the households were severely food insecure as shown in Figure 2. Among the medium density respondents, 8.6% were food secured, 15.2% were mildly food insecure 4.4% were

moderately food insecure, while only 3.2% of the households were severely food insecure. For the low density area respondents, 12.7% were food secured, 13.6% were mildly food insecure 3.2% were moderately food insecure, while only 2.4% of the households were severely food insecure. The study revealed that respondents in the low density areas were more food secured than those in the medium and low density areas.

Percentage of Food Groups consumed by Respondents

The percentage of food groups consumed by the women is shown in Figure 3 with all the food groups listed. The starchy staples food group 99.4% was mostly consumed by the women in the three selected areas. More than two-third of the women consumed beans and other legumes while nuts and seeds were consumed by more than half of them (54.1%). Dairy was mostly consumed among women in the high density (78.4%) areas. Fleshy foods were consumed by almost three-quarter of the respondents (76.2%) while eggs were poorly consumed in the high density respondents (18.6%).

Vitamin A dark green leafy vegetables were consumed by 60.8% of the women. Other vitamin A- rich fruits and vegetables, other vegetables and other fruits were consumed at low levels in the three different locations. This study revealed that starchy staples and beans and other legumes were the most commonly consumed food groups, while other vegetables and fruits were mostly less consumed by women residing in the high density areas.
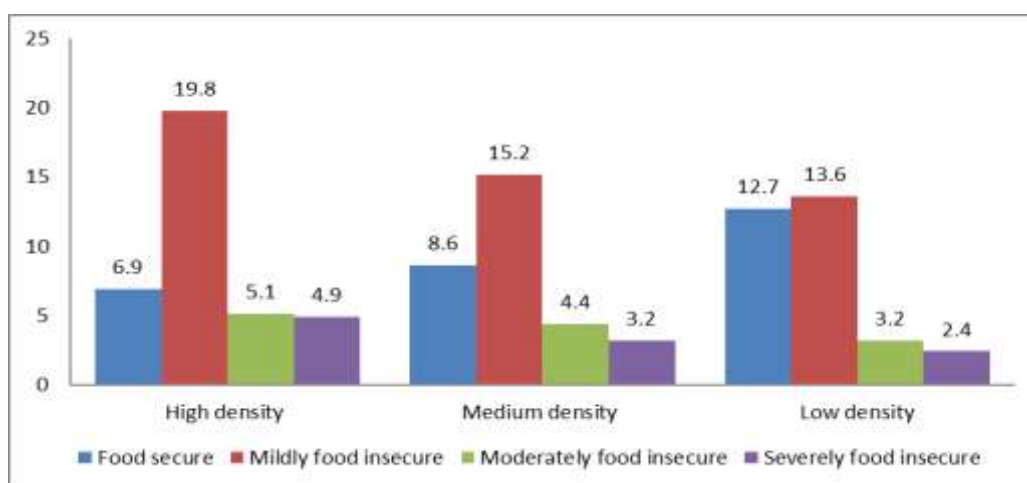

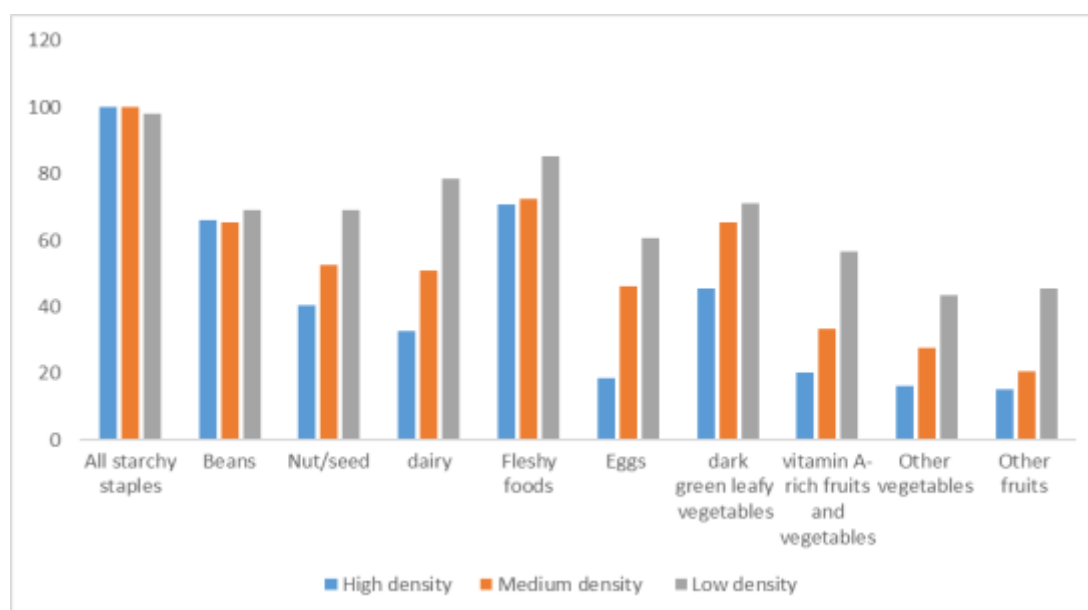**Figure 2: Household Food Insecurity Status of Respondents**

Figure 3: Percentage Consumption of food groups by Respondents

Dietary Diversity Score

The Dietary Diversity Scores for the women as shown in table 3 revealed that 21.1% of the respondents had up to 4 dietary diversity scores. About 36.3% of the women in the high density areas had 5-7 dietary diversity scores, while 56.7% of the women had between 5-7scores. The low density respondents had the highest dietary diversity score (30.4%) between scores 7-8, while the high density respondents had the least score (22.2%) in this category.

Table 3: Dietary Diversity Score of Respondents based on Location

Scores	High density	Medium density	Low density	Total
	%	%	%	%
Less than 4	59.6	21.6	18.8	21.1
5-7	36.3	55.2	70.8	56.7
8-10	5.1	14.2	30.4	22.2

IV. Discussion

This study investigated household food security and dietary diversity in Ibadan South West Local Government Area, Oyo State, Nigeria.This study reported that inadequate access to funds was common among the high density respondents; hence most of them could not consume healthy food but just limited to certain foods they can afford or skip meals. This is similar to a study that reported a high level of food insecurity among poor urban households in Kenya[19]. This could be as a result of high levels of poverty predominant among the high and medium density areas. Urban populations are often thought to have better social indicators than rural areas; however, the growth of slums has eroded this advantage[20]. Research has shown that urban poor are often worse than their rural counterpart [21]. In slum setting, food insecurity leads to decreased food intake or skipping of meals as well as lack of nutritious foods to meet the dietary needs of household members[19].

This study reported about a third of the women (33.8%) were food secure, 45.1% were food insecure without hunger, while 21.6% were food insecure with hunger. This agrees with the study that conducted a survey of household food security among urban families in Lagos State, Nigeria[21] and reported that only 33.8% of households were food secure, 45.1% were food insecure without hunger and 21.1% were food insecure with hunger. Similar findings which agree with this study was also reported by Martin-Prevel *et al*.[22] which reported a similar proportion of women who participated as food secure. However, the study used the six-item HFIAS survey tool. The household food security level was much lower than levels reported from other studies in Ondo, Nigeria[23] and Nairobi, Kenya[24] but higher than what has been found in Latin America among urban households.[25]

This study reported that 7.2% of the women were underweight, 53.7% had normal weight, while 26.0% were overweight. More than one-fifth of the women were overweight and further confirms the popularity and increase in obesity among women in the urban settings which are often higher than those in the rural population due their access to more funds which often promotes sedentary lifestyles and also consumption of energy dense foods which promotes obesity among women. This is similar to observations made by Umuerri[26] who stated that the proportion of obese persons in the urban is three (3) times those in the rural areas (15.7% versus 4.7%) while Chukwuonye[27] in 2013 stated that the same trend in his results. Others studies that affirmed obesity as an urban problem in Nigeria.[28,29,30]

The high prevalence of overweight obtained in this study may be due to the type of lifestyles and dietary habits of the peculiar to people living in the low density areas. This includes the habit of regular consumption of energy dense foods that are not nutritious to the body but often promotes accumulation of body fat and increases the prevalence of obesity. City life encourages and promotes regular consumption of energy dense foods. This is so because most women in the city are very busy due to their work schedules and lack of enough time to go to the market and prepare meals which are nutritious and healthy for the family most of the time but will rather prefer a faster means which are often energy dense foods which are ready-to-eat in the eateries. Consumption of this type of foods contributes to weight gain to further promote obesity among them which indirectly predisposes them to cardiovascular diseases such as hypertension, cancer, diabetes[31].

The increase in the prevalence of obesity could also be due to the fact that some women do not regain their pre-pregnancy size after giving birth but tends to retain the newly gained weight as reported by Liu *et al*[32]. Furthermore, the highest prevalence was observed among those living in the low density areas. This could be due to high standard of living which promotes sedentary lifestyles and low physical exercise, better assess to social amenities, higher level of income and educational status, increase in level of consumption of junks and fatty foods which often encourages the accumulation of fat in their bodies.

The dietary consumption pattern of the women showed that more than 70% of the women had scores greater than five. Respondents in high and medium density areas had low consumption levels in eggs, meat, fruits and milk and milk products. The decrease in consumption level of meat, fish and fruits could be as a result of low purchasing power of the family. Prices of fruits, meat and eggs may not be affordable by the respondents since poverty is more common among the people living in high density areas. Furthermore, they might not be well informed or knowledgeable about the health benefits that could be derived by consuming these food groups. There is therefore the need for nutrition education on the benefits of diversification of diets to improve the nutrient intake of the women and other nutrient such as vitamins, proteins and minerals are also necessary for healthy living in spite of the high energy intake.[33,34]

V.   Conclusion

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 vitamin A- rich fruits and vegetables were consumed at low levels especially among women the high density locations. 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 programmes among women.

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