

*Full Length Research Paper*

# Prevalence of Food Insecurity and Inadequate Dietary Pattern Among Households with and without Children in Imo State Nigeria.

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The purpose of this study was to determine the dietary patterns and prevalence of food insecurity among households in Imo State Nigeria. A total of 411 head of households were selected as a convenience sample and interviewed using a questionnaire containing the Radimer/Cornell hunger and food insecurity items, food frequency table, demographics, residence, education level, and marital status. Pearson Chi-square was used to determine the prevalence of food insecurity and the association between food insecurity and dietary habits. Descriptive statistics was used to determine the frequency of food consumption. Results show that 51.6 percent of women head of households experienced severe food insecurity and 49 % reported food insecurity with moderate hunger. Thirty three percent of two parents participants experienced severe food insecurity, 66% reported food insecurity with moderate hunger, and 1.4% were food secure. Twenty- one percent of individuals without children experienced severe food insecurity while 79.5% were food insecure with moderate hunger. The difference between groups was statistically significant at  $p < 0.001$ . The prevalence of food insecurity was higher in those with less than high school education at  $p < 0.001$ . The consumption of foods decreased as the presence of food insecurity increased.

**Key Words:** Food insecurity, Head of Household.

## INTRODUCTION

Food consumption patterns can be defined as the familiar ways of eating foods. Rural residents tend to adhere to their eating patterns instead of changing to a new and more appropriate eating habits (Ogunniyi, 2012). In order to maintain healthful diet, Jama (2002) stated that a variety and balance of foods from all food groups and moderate consumption of all food items is very important. Widespread poverty resulting in chronic and persistent hunger is the biggest problem in the developing countries. In Nigeria, malnutrition is associated to food shortage linked to both quantity and quality of food to

provide a balance diet (Durojaie, 1987). Malnutrition is a condition which occurs among large sections of the poor, mainly amongst women and children. In a broader sense, the variable of concern is household's welfare, which is an important component for determining nutritional status.

It is reported that Nigeria's total agricultural output in areas of food production (including live stock and fishing), processing and marketing accounted for about 80% by value. However, in spite of the increase of food to the Nigerian agricultural economy, the food intake in the

country was still inadequate in terms of quantity and quality (Ogunniyi, 2012).

Food consumption studies assess immediate causes of malnutrition, and food security studies predict the adequacy of household dietary intake and nutritional status.

Food security is defined as access to nutritionally adequate and safe food for a healthy and active life. Food insecurity exists when the availability of nutritionally adequate and safe foods, or the ability to acquire foods in a socially acceptable way, is limited or uncertain (Life Sciences Research Office 1990). There is a direct relationship between food insecurity, hunger, and poverty. Also, studies have shown a direct relationship between food insecurity and malnutrition (Huet, 2012; Nalty, 2013; Sean, 2012). One of the contributing factors to food insecurity is socio-economic status. Limited income causes people to restrict the number and quality of meals they eat, reduce dietary variety, and look for inexpensively processed food. These options are usually low in essential nutrients and high in fats with empty calories (Nagataab, 2012; Sharkey, 2012).

Studies on the consequences of food insecurity show an association between food insecurity and lower cognitive performance, poor health, obesity, cardiovascular disease, and depression (Derek, 2013; Gao, 2009; Lyles, 2013; Rahul, 2013; Seligman, 2012). Therefore, food insecurity research helps characterize the impact of malnutrition on the quality of life. Increased food prices have made the situation worse. Studies in Nigeria show prices for millet, maize, and sorghum have increased by about 100 to 200% since 2007, and, consequently, lead to an increase in malnutrition, poverty, and threats to peace and stability (Cleaver, 2006; Monty, 2008; Olanike, 2007). In Nigeria, few studies measure food security status of households, despite general beliefs that many Nigerians are food insecure (Olanike, 2007; Sanusi, 2006). Other studies have demonstrated daily eating frequency was directly related to adequate carbohydrates, folic acids, vitamin C, calcium, magnesium, iron, potassium, and fiber intakes, while irregular eating was related to protein, total fat, cholesterol, and sodium intakes. Reports also show high intake of these nutrients could cause chronic health conditions (Albertsona, 2013; Dava, 2009; Liping, 2012; Mohamadpour, 2012; Popkin, 2012). The international covenant on Economic, Social, and Cultural Rights, adopted by the United Nations in 1966, formalized the right to food as a basic human right (Food and Agriculture Organization of the United Nations (FAO) 1996; Mamadou, 2006). A more general human rights framework affirms the basic rights of all people irrespective of race, culture, religion and gender. This approach implicates local, nongovernment, and international leaders to define policy and actions to reduce hunger. It refocuses attention on important aspects of food security, including the responsibility of international institutions and states to guarantee human

rights, and the ways of incorporating rights-based indicators into food security measurement (Mohamed, 2013). A study in Lagos and Ibadan, Nigeria shows that household food insecurity is over 70 % (Sanusi, 2006). Therefore, addressing food insecurity requires knowing the groups and communities affected, and prevalence of the problem. The purpose of this study was to determine the dietary patterns and prevalence of food insecurity among households in Imo State Nigeria.

## MATERIALS AND METHODS

A study was conducted to assess food insecurity and dietary patterns among households in one city (Owerri) and two rural (Okigwe and Orlu) Local Governments in Imo State Nigeria. Data were collected during the months of June and July for two consecutive years, 2011 and 2012. The study was conducted according to the guidelines found in the Declaration of Helsinki and all procedures involving human subjects were reviewed and approved by the University's Human Subject Institutional Review Board and the College of Education Institutional Review Board prior to conducting the research. Each participant was approached and asked if he/she was willing to participate in the study. Some refused to participate. A verbal informed consent was sought and obtained from participant. The consent was witnessed and formally recorded prior to the data collection. Those who wanted to participate were asked to meet the interviewer at a secluded area at the place alone to maintain confidentiality. A total of 434 head of households were randomly selected as a convenience sample and interviewed using a questionnaire containing the Radimer/Cornell hunger and food insecurity items (Kendall, et. al., 1995), the food frequency checklist, demographic characteristics, area of residence, education level and marital status during home visits and at community centers. Each interview was completed within 20 to 30 minutes. Convenience sampling method was utilized because it helped in gathering useful data and information that would not have been possible using probability sampling techniques. However, the limitation for this method of sampling is that it may not be representative of the entire Imo State population.

The food frequency checklist grouped foods according to similarities in food composition. For example, milk, cheese, and yogurt were grouped into dairy foods; the meat group included fish, chicken, turkey, eggs, groundnut, and dry beans; fresh vegetables were grouped into a vegetable group; citrus fruit or juice, mango, guava, and pawpaw were grouped as fruit; bread, cereals, yam, potato, cassava, rice, and pasta were grouped as grain products; candy, soft drinks, and syrups were grouped as sweets; chips, chin-chin, and cookies were grouped as fatty foods; and ukpa, moi-moi, and akara were grouped as snacks. The questionnaire had been previously tested internationally in countries, such as India (Nweze, 2002). Twenty-three questionnaires were excluded from the study because of unanswered questions. Therefore, this study collected 411 usable surveys.

For comparison purposes, participant's surveys were divided into groups, based on marital status, education level, type of household, and area of residence, such as rural. This division resulted in 95 women head of household, 277 were two-parents household, and 39 participants were household without children. Participants were also grouped into area of residence and three educational categories. This resulted in 201 participants with less than elementary school education, 108 had high school education, and 102 had greater than high school education. Sixty-eight participants lived in Owerri (city), and those from rural areas were 82 households from Okigwe and 261 households from Orlu. This study was based on Campbell's (Campbell, 1991) conceptual

framework that food insecurity can affect health and quality of life, either directly or indirectly, through nutritional status.

### Data collection

As part of the College of Education's course requirements, four-senior classification nutrition and dietetics students enrolled in a community nutrition course and were required to participate in a service learning activity. Community service learning experiences were integrated into a Community Nutrition course. This course is required for all Food and Nutrition/Dietetic students. Service learning was integrated into the course content, assignments, and in-class and out-of class activities.

Service learning activities provide students an opportunity to participate in a community service and reflect on the service activity in such a way to gain further understanding of course content, broader appreciation of the discipline, and an enhanced sense of civic responsibility. The students interviewed a total of 168 of the participants and the authors interviewed a total of 266.

### Data Analysis

The questionnaire was coded for statistical analysis by coding food insecurity responses and assigning food security scale values. Households were categorized by food security status with methods outlined by the U.S. Department of Agriculture (USDA) (Bickel, 2000; Hamilton et al, 1997). The USDA typically groups food security into four categories: Food secure- households show no or minimal evidence of food insecurity.

Food insecure with moderate hunger- food intake for adults in the household has reduced to an extent that implies that adults have repeatedly experienced the physical sensation of hunger; such reductions are not observed at this stage for children.

Food insecure with severe hunger- at this level, all households with children have reduced the children's food intake and adults report going days with no food owing to a lack of resources.

Food insecure without hunger- households are concerned about adequacy of the household food supply and adjustments to food management. Little or no reduction in members' food intake is reported. This category was not analyzed in this study because the authors focused mainly on the reduction in the household food intake. The questionnaire contained 16 items about experience of food insecurity. A score was allocated for each question as follows: 3 if the statement never occurred, 2 if it occurred sometimes, and 1 if it occurred often. Respondents were classified into one of the three food security status categories on the basis of their total score value on the food security scale. Households with a mean score of three were classified as food secure, households with a mean score of two were classified as food insecure with moderate hunger, and households with a mean score of one were classified as food insecure with severe hunger.

### Statistical Analysis

Data from each questionnaire were coded and analyzed using the Statistical Package for Social Sciences (SPSS). Pearson's Chi-square test was utilized to determine the prevalence of food insecurity, and the association between food insecurity and food group intake, education level, marital status, and area of residence. Descriptive statistics were used to determine the frequency of food group intake. Statistical significance was set at  $p < 0.05$  level.

## RESULTS

The findings for the prevalence of food insecurity within

the households surveyed are presented in Table 1. Pearson's Chi-square test was utilized to calculate the percentage presented in Table 1. Results show that 51.6% of households headed by women experienced severe food insecurity more than households with two parents (33%). This was statistically significant. In comparison, households with children experienced more food insecurity than households without children. Twenty-one percent of the households without children were food insecure with severe hunger, while 52% of the households headed by women reported severe food insecurity, and 32.5% of two parents households experienced severe food insecurity. The difference between households with children and households without children was statistically significant. Also, in Table 1, participants with less than elementary school education were more food insecure than those with a high school education and those with greater than high school education. The difference was statistically significant. When participants were grouped according to gender, female participants experienced more food insecurity than male participants and this was statistically significant. Results also showed participants living in rural areas reported more food insecurity than participants in the city,  $p < 0.01$ .

Table 2 contains the percentages of the food group intake and its association to food insecurity of the households surveyed. Results showed consumption of milk products, meat, and grain products decreased as food insecurity became severe. Also, consumption of food from all food groups decreased significantly as the presence of food insecurity increased for all participants, as shown in Table 2. There was a relationship between food insecurity and the number of snacks consumed per day. Forty percent of participants experiencing food insecurity with severe hunger consumed snack foods (ukpa, moi-moi and akara) one to two times a week. This was statistically significant.

Table 3 shows the percentage of food group consumption. Frequency distributions were used to obtain descriptive statistics to calculate the percentages for food group intake. Results showed consumption from all food groups was low. Sixty-one percent of the participants consumed cereal products two to three times per week and 67.9 percent consumed meat products two to three times per week. Thirty-one percent of the participants rarely consumed dairy products, while 22.6% never consumed any dairy products. Fifty-one percent of the participants consumed fruits two to three times week. Also, only 30% of the participants consumed vegetables two to three times a week. Seventy-two percent of the participants stated they sometimes produced their own foods.

## Discussion

In this study, households with children were more food

**Table 1.** The Comparison of Participant Characteristics by Food Insecurity Status.

	Food Insecure with Severe Hunger %	Food Insecurity with Moderate Hunger %	Food Secure %	*P< Value
<b>Households</b>				
Without Children	20.5	79.5	0.0	
Women Head of Household	51.6	49.4	0.0	0.001
<b>Two-parents Household</b>				
Education Levels	32.5	66.1	1.4	0.001
Less than Elementary School				0.001
High School	41.3	58.5	0.0	
Higher than High School	44.2	54.8	1.0	0.001
	15.7	81.4	2.9	0.001
<b>Gender</b>				
Male	23.1	75.4	1.5	0.02
Female	38.0	61.4	0.6	
<b>Region</b>				
Region 1	16.2	82.4	1.5	0.01
Region 2	20.7	79.3	0.0	
Region 3	45.6	53.3	1.1	

\*Significant difference within food insecurity.

**Table 2.** The Percent of Food Group Intake and Food Insecurity Status of the participants.

Food Group	Food Insecurity with Severe Hunger %	Food Insecurity with Moderate Hunger %	Food Secure %	*P< Value
<b>Milk</b>				
1-2 times/week	29.8	68.6	1.6	
Seldom/Never	41.1	58.5	0.5	
<b>Meats</b>				
1-2 times/week	34.2	64.6	1.2	
Seldom/Never	42.3	57.7	0.0	0.01
<b>Ukpa, moi-moi, and akara</b>				
1-2 times/week	40.2	58.8	1.0	
Seldom/Never	25.0	74.1	0.9	
<b>Vegetables</b>				
1-2 times/week	36.4	62.6	0.0	
Seldom/Never	24.1	75.9	0.0	

**Table 2.** Cont'd

<b>Fruit</b>	37.8	61.2	0.9	
1-2 times/week	28.6	70.2	1.2	
Seldom/Never				0.05
<b>Grains</b>	34.7	64.2	1.1	
1-2 times/week	43.1	56.9	0.0	
Seldom/Never				
<b>Chips, chin-chin, cake, cookies</b>	40.4	59.6	0.0	0.05
1-2 times/week	33.2	65.3	1.5	
Seldom/Never				0.03
<b>Sweet/candy</b>	28.2	70.0	1.8	
1-2 times/week	39.0	60.2	0.7	
Seldom/Never				
<b>Soft drinks</b>	34.6	64.9	0.5	
1-2 times/week	37.6	61.1	1.4	
Seldom/Never				

\*Significant difference within food insecurity.

**Table 3.** Percentage of Food Group Intakes by Participants

<b>Food Group</b>	<b>2 to 3 times a day</b>	<b>Once a day</b>	<b>2 to 3 times a week</b>	<b>Seldom</b>	<b>Never</b>
Milk, cheese, yogurt, or cottage cheese	1.2	12.2	33.1	30.7	22.6
Meats, chicken, turkey, fish, crayfish, eggs, dried beans, and groundnuts	0.5	12.6	67.9	19.0	0.0
Ukpa, moi-moi, and akara	0.5	14.5	57.6	25.7	1.7
Citrus fruit or juice, mango, guava, and pawpaw	4.9	23.7	50.9	16.9	3.7
Vegetables	30.4	41.9	20.6	5.9	1.2
Breads, cereals, rice, spaghetti, macaroni, rice, yam, potatoes, cassava	1.0	26.0	60.6	12.4	0.0
Chips, chin-chin, cakes, cookies	0.2	5.9	30.5	53.9	9.3
Sweets, candy	2.7	9.0	15.7	36.7	35.7
Soft drinks (carbonated drinks)	1.0	5.9	39.4	48.3	5.4

insecure than those without children. A majority of the participants experienced food insecurity with moderate hunger. The terms mild, moderate, and severe are used to indicate degrees of severity of malnutrition. The risk of

morbidity increases sharply with severe malnutrition. Moderate malnutrition may play a role in duration and possibly severe illness. Although the findings are not generalizable to a given area because the study had a

relatively narrow set of conditions (convenience sample), it reinforced other studies. These results support recent food insecurity and hunger studies in Nigeria (Olanike, 2007; Sanusi, 2006). The households at the most risk for food insecurity and malnutrition were households with children and those headed by woman. Fifty-two percent of the households headed by women reported severe food insecurity; other studies reported similar findings (Bawadi, 2012; Beaumier, 2010). This study determined these households used a variety of coping strategies to avoid hunger, including eating less-varied diets, producing their own foods, mainly in the rural areas and borrowing food. These findings were also reported in another study (Obayelu, 2013). This study also showed households living in rural areas were more food insecure than those living in a city. However, there was evidence of food insecurity in both rural and urban areas. A recent study also reported food insecurity with individuals living in cities (Becquey, 2010).

Results from this study show participants with less than elementary school education were more food insecure than those with high school education or higher. This finding supports other studies that reported the relationship between level of education and food insecurity in rural dwellers (Gao, 2009). Other studies reported preschool food security increased with an increasing level of education of the mothers and women with high school education were twice as likely to have well-nourished children compared to illiterate and primary educated mothers (Gorton et al, 2010; Ojiako, 2009).

In this study, participant's frequency of food consumption from the food groups decreased as the presence of food insecurity increased. Other studies also reported the frequency of fruits, salads, carrots, and vegetables consumption, and household availability for all food categories decreased significantly as food insecurity status worsened (Kendall et al., 1996; Kirkpatrick, 2008; Middaugh, 2012; Tarasuk, 2001).

The limitations for this study included a convenience sample and multiple interviewers, which could introduce bias. The sample was not representative of the entire Imo State population. In addition, there were time constraints it took about 20 to 30 minutes to interview each participant.

## CONCLUSIONS

Households with children reported food insecurity more than households without children. The frequency of food consumption from all food groups decreased as food insecurity increased. An association was determined between education level and food insecurity, the less schooling the more likely there is food insecurity for the individuals and/or his/her family.

This study demonstrates food insecurity is prevalent among households with children. Efforts to reduce food insecurity and subsequent malnutrition must focus on the

immediate causes, such as inadequate dietary intake, poverty, level of education, and area of residence.

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