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Effect of Climate Change on Anthropometric Status of Women in Nsukka L.G.A of Enugu State, Nigeria

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Abstract:

Background: Climate change can affect anthropometric status of women negatively as a result of losses in body mass for the most vulnerable ones.

Objective: The study focuses on the effect of climate change on anthropometric status of women in Nsukka local government area.

Materials and methods: The study adopted a survey and experimental research design. Two hundred and fifty-one (251) respondents were selected from the different communities in Nsukka local government area using multistage sampling technique. The instrument used to collect data was the questionnaire and interview on the socio-economic characteristics of the respondents. Anthropometric data (height and weight) were also used. The data was analyzed using descriptive analysis frequency, percentage, etc. while the null hypothesis was tested using t-test statistics decided at 5% level of significance.

Result: The study found out that most communities in Nsukka local government area experience high winds, warmer and frequent hot days and nights over most land area, droughts and high tides during climate change events. The anthropometric analysis showed that out of 251 women sampled, 112(44.8%) maintain normal weight, while 81(32.4%) were found to be underweight. There were few cases of obesity among the surveyed women 16(6.4%).

Conclusion: Good Nutrition is the key to good lifestyle and it is essential to support growth and meet the physiological demands of women, the study therefore, recommend that women empowerment should be encouraged to the rural areas, and that will help to improve the family finance, better food security and better women nutritional status.

Keywords: Underweight, anthropometric data, normal weight, anthropometric status, climate change

1. Introduction

Climate change refers to any change in climate over time (decades or longer), whether due to natural processes or as a result of human activity (1). Climate change is a significant and lasting change in the statistical distribution of weather patterns over periods ranging from decades to millions of years. It may be a change in average weather conditions, or in the distribution of weather around the average conditions (i.e., more or fewer extreme weather events). The most general definition of climate change is a change in the statistical properties of the climate system when considered over long periods of time, regardless of cause (2). Accordingly, fluctuations over periods shorter than a few decades do not represent climate change. (3) viewed climate change as caused by factors that include oceanic processes (such as oceanic circulation), biotic processes, variations in solar radiation received by earth, plate tectonics and volcanic eruptions, and human-induced alterations of the natural world. These latter effects are currently causing global warming and "climate change" and are often used to describe human-specific impacts.

Anthropometric measurement refers to the measurement of the size and proportion of human body. Anthropometric measurements are relatively non-invasive methods that assess the size or body composition of an individual. Of all methods of examining nutritional status, anthropometric measurement is perhaps the earliest, fastest, and cheapest method.

The advantage of anthropometric measurement is not only in relative cheapness and ease of use of equipment and qualified as required by clinical and biochemical assessment. The most common aim includes height, weight, Body mass index (BMI), head and waist circumference, maximum thigh circumference. It is also used to classify individuals as healthy and non-healthy weight. In the United States and other developed countries, the emphasis for unhealthy weight is overweight and

obesity. BMI, regardless of age and population is normal at 18.5 to 24.9kg/M². It indicates overweight at the range of 25.0-29.9kg/m² (USDA and USDHHS, 2000). In general, BMI greater than 30 is assumed to be due to excessive adiposity. Climate change affects nutritional anthropometric variables such as growth failure, malnutrition and under-nutrition due to protein and calories deficiency.

Climate change can affect anthropometric status of women negatively as a result of lose in body mass for the most vulnerable ones. According to (4), individual measures of body size (height, weight, percent body fat, bone density, head and waist circumference) are useful in the assessment of climate change effect on nutritional status, because these are frequently performed and error in records usually occurs in clinical practice.

2. Materials and Methods

2.1. Area of Study

The study was carried out in Nsukka Local Government Area. Nsukka is a town and Local Government Area in Enugu State in South-East Nigeria. Other towns that share common border with Nsukka, such as Enugu Ezike, Orba and Obollo-Afor (formerly centre of the palm oil trade), Ede-Oballa, UzoUwani and Mkpologwu, now also claim the name Nsukka, hence they all collectively fall into the political zoning system in Nigeria known as Senatorial Zone. Nsukka Town is known as the site of the University of Nigeria, the first indigenous Nigerian University, founded by Dr. NnamdiAzikiwe, the first President of Nigeria.

2.2. Population of the Study

The population of the study comprised all the women of Nsukka Local Government Area. Information from Nsukka local governments headquarter revealed that their population were 309,633 in which around 56% are women according to 2006 Census estimate.

2.3. Sample and Sampling Techniques

Multistage sample procedure was used to select 251 respondents from Nsukka Local Government Area. According to the (5), Nsukka Local Government Area is made up 16 major communities. For the purpose of this study, sampling was made from the 16 communities.

In the first stage, the researcher selected clusters of five communities by balloting method. The second stage saw the researcher using a simple random sample to select 50 households from four communities and 51 in the remaining one community. Thereafter, questionnaire was administered to any woman that is educated enough to fill questionnaire, in each of the selected household, since the interest of the researcher is on women. In all, a total of two hundred and fifty-one questionnaires (251) were administered.

2.4. Data Collection

The instrument used for the study consisted of 27 five points Likert type scale structured questionnaire and anthropometric indicators. The structured questionnaire contained two sections, A and B. Section A dealt with the personal data of the respondents, while section B dealt with the research questions that guided the study. The questionnaires contained socio-economic characteristics of women such as age, marital status, the women's educational level and information on the Body Mass Index of the women.

The anthropometric measurement has to do with the height and weight of the subject taken and the BMI obtained. BMI is a means of assessing healthy body weight. The body mass index indicates the relationship of body weight (expressed in kilograms) to height (expressed in meters). The anthropometric measurements taken in this study comprises the height and weight with the help of the research assistants, the body weight was taken with minimum clothing on. The weights were taken to the nearest 0.1kg. The heights were taken with a measuring tape, coloured chalk, pen and paper.

2.5. Statistical Analyses

The data from the questionnaire were described using mean and standard deviation, while the null hypothesis was tested using t – test statistic at 0.5 level of significance. If the calculated t – value is less than the t – tabulated value, the null hypothesis was accepted. If otherwise, it was rejected and the alternative hypothesis accepted. Anthropometric data collected was analysed and presented using frequency and simple percentages.

3. Result

Age Range	Frequency	Percentage
18 – 35 years	151	60.2
36 year and above	100	39.8
Total	251	100

Table 1: Frequency and Percentage Distribution of Respondents by Age
Source: Field Survey, 2013

Table 1 shows that 151 women representing 60.2% of the total sample were within the age range of 18 – 35-year-old, while 100, representing 39.8% of the respondents were above 36 years old.

Variable	Frequency	Percentage
Underweight	81	32.4
Normal	112	44.8
Overweight	41	16.4
Obese	16	6.4
Total	250	100

Table 2: Anthropometric Result of the Subjects
Source: Field Survey, 2013

Table 1 shows that out of 250 women sampled, 112 (44.8%) maintain normal weight, while 81 (32.4%) women are found to be underweight, since their Body Mass Index is less than 18.5. There were few cases of obesity among the surveyed women since only 16 out of 250 which represent 6.4% of the women are obese.

We present the mean response and standard deviation of the perception of the respondents' views on the effect of climate change on Anthropometric status of women in Nsukka area.

	Item Statement	Mean Responds	Std. Deviation	Remark
22.	Rich women experienced a significant decrease in fat intake "during the climate change".	3.4382	0.76888	Accepted
23.	Before crisis, the carbohydrate, vitamin A, calcium, and iron intake of urban, poor women are the highest.	3.1992	0.76430	Accepted
24.	Urban poor experienced decrease in weight concentration during climate change.	3.3984	0.70473	Accepted
25.	During climate change women become under weight.	3.1992	0.80508	Accepted
26.	Negative changes in fat density during climate change are experienced by rich and the rural and poor women.	3.3227	0.84110	Accepted
27.	The protein, fat, carbohydrate and calcium intakes of urban poor decreased during the transition.	3.2629	0.80161	Accepted

Table 3: Mean Response of Respondents on the Effect of Climate Change on the Anthropometric Status of Women
Source: Field Survey, 2013

The result in table 2 shows that the respondents agree that rich women experienced a significant decrease in fat intake because during climate change women become over weight, that before climate change crisis, the carbohydrate, vitamin A, calcium, and iron intake of urban poor women are the highest. Also, that during climate change many women become obese due to the type of food consumed, that urban poor women experienced decrease in weight concentration during climate change. During climate change women become underweight. Negative changes in fat density during climate change are experienced by rich and the rural and poor women, and lastly, that the protein, fat, carbohydrate and calcium intakes of urban poor decreased during the transition.

4. Discussion

From the result the respondents agreed that wind is always very high throughout the year in some areas in Nsukka, there have been normal, instead of longer rainy season in Nsukka communities, the communities usually experience high tides through the years, there have been failed harvest due to climate change, there have been shortage of water due to climate change, there have been droughts for some period in some communities in Nsukka. The findings are corroborated in (6), where they assert that climatic related calamities prevalent in Nigeria are devastating floods, prolonged droughts, harsh weather, and high temperature.

Also, the finding is in line with the reports of (7), which identified the frequency and intensity of floods and droughts change in many parts of Nigeria. The report summarized the climate change prevalent in Nigeria to include; warmer and more frequent hot days and nights over most land areas; warmer and more frequent hot days and nights over most land areas; warm spells / heat waves - Frequency increases over most land areas; heavy precipitation events - Frequency (or proportion of total rainfall from heavy falls) increases over most areas; and area affected by droughts increases.

The Nigerian Meteorological Agency (8) also confirms the forms of climate change prevalent in Eastern part of Nigeria, when it revealed that north-easterly winds which raise and transport dust particles from the Sahara Desert prevail all

over south-eastern Nigeria during the harmattan period (November – March). The overall changes in temperature, rainfall and other meteorological parameters determine the changes in climate in the southern Nigeria, Nsukka inclusive.

The result in the questionnaire shows that the respondents agree that rich women experienced a significant decrease in fat intake because during climate change women become over weight, that before climate change crisis, the carbohydrate, vitamin A, calcium, and iron intake of urban poor women are the highest. Also, that during climate change many women become obese due to the type of food consumed, that urban poor women experienced decrease in weight concentration during climate change. During climate change women become underweight. Negative changes in fat density during climate change are experienced by rich and the rural and poor women, and lastly, that the protein, fat, carbohydrate and calcium intakes of urban poor decreased during the transition. According to (4), individual measures of body size (height, weight, percent body fat, bone density, head and waste circumference) are useful in the assessment of climate change effect on nutritional status, because these are frequently performed and recorded incorrectly in clinical practice. This result underlines the relationship of food intake and anthropometric measures. According to (9), food is important for humans as part of social life and especially because it contains nutrients needed by humans. Foods eaten in amounts that are too small, or too large, or that is unbalanced, results in malnutrition or diseases and consequently affect weight. The women perception on the effect of climate change on Anthropometric status of women according to their family structure are statistically significant, indicating that family structure affects women perception of climate change effect on Anthropometric status of women.

5. Conclusion and Recommendation

The findings of this study have some serious implications. First is that women are most vulnerable folks to climate change effects, especially in the rural areas such as Nsukka, where poor women depend on natural weather condition to grow their food. During climate change crisis, prices of agricultural products rises due to poor food yield, and this affects income negatively, leading to a higher intake of carbohydrates food, exposing the women to unbalance nutritional diet. The study was carried out to assess the perceived effect of climate change on anthropometric status of women in Nsukka local government. From the results analysed, it was seen that larger percentage of the women are normal that is within the range of 18.5-24.99kg/m². 32.4% of the women are underweight which indicates poor nutritional status. 16.4% of the women are overweight and 6.4% of the respondents are obese. Furthermore, it was observed that women consumed less fruits and Vitamin A rich foods. In conclusion, there is an incidence of underweight due to poor eating habits and also overweight due to lack of expenditure of Energy to attain an Ideal Body weight. Due to the poor intake of fruits and vitamin A rich foods, it increases their susceptibility to infections. Also, the higher prevalence of short stature in subjects of the low socio-economic group indicates nutritional deficiencies in the past. Nutritional problems were predominantly present in women of the middle age group (18 to 35 years old), and the high prevalence of both low BMI and low energy intake emphasize the vulnerability of this group to malnutrition. Good Nutrition is the key to good lifestyle and it is essential to support growth and meet the physiological demands of women, the study therefore, recommend that women empowerment should be encouraged to the rural areas and that will help to improve the family finance, better food security and better women nutritional status.

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