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# Nutrition Education and Care Practices of Mother/Caregivers of Children in Internally Displaced Persons Camps in Nigeria

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Abstract

This study assessed the impact of nutrition education on the care practices of mothers/caregivers of children in Internally Displaced Persons (IDP) camps in Nigeria, with a focus on improving nutrition outcomes and reducing malnutrition. A cross-sectional study was conducted in three IDP camps in Abuja, Borno, and BayelsaStates; involving 1,420 children aged 6-59 months and their caregivers. The study used a two-stage sampling technique and collected data on anthropometric measurements, dietary habits, and care practices. Nutrition education was provided to caregivers, and follow-up assessments were conducted after 8 weeks. Results showed significant improvements in exclusive breastfeeding (from 8% to 15%), timely initiation of complementary feeding (from 15% to 30%), deworming (from 16% to 57%), and immunization practices (from 39% to 61%). The study highlights the importance of nutrition education in improving care practices and recommends scaling up nutrition education programs in IDP camps to improve the health and nutrition of children, ultimately contributing to the achievement of Sustainable Development Goal 2 (Zero Hunger) and Goal 3 (Good Health and Well-being). The findings of this study have implications for policymakers, healthcare providers, and stakeholders involved in nutrition programming in IDP camps and other humanitarian settings.

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**Keywords:** *Nutrition Education, Care Practices, Mother-Caregivers, Children, Internally Displaced Persons.*



## Introduction

Malnutrition is a significant public health problem in Nigeria, particularly among children under five years old, with 37% of children stunted and 18% underweight **(National Bureau of Statistics [NBS], 2019)**. Internally Displaced Persons (IDP) camps are vulnerable to malnutrition due to limited access to nutritious food, healthcare, and sanitation **(United Nations Children's Fund [UNICEF], 2020)**. The humanitarian crisis in Nigeria, fueled by the Boko Haram insurgency, has led to the displacement of over 2 million people, with many seeking refuge in IDP camps **(International Organization for Migration [IOM], 2020)**.

Nutrition education is a critical component of interventions aimed at improving nutrition outcomes in IDP camps **(Bhutta et al., 2018)**. However, there is limited evidence on the effectiveness of nutrition education in improving care practices in IDP camps in Nigeria.

According to the World Health Organization **(WHO, 2018)**, optimal breastfeeding and complementary feeding practices can reduce the risk of under-five mortality by 13% and 6%, respectively. However, in Nigeria, only 17% of children are exclusively breastfed, and 35% are fed with a minimum acceptable diet **(NBS, 2019)**. Nigeria has one of the highest burdens of malnutrition in the world, with an estimated 2.5 million children under five years old suffering from severe acute malnutrition (SAM) **(UNICEF, 2020)**. The prevalence of stunting among children under five years old in Nigeria is 37%, while the prevalence of wasting is 7% **(NBS, 2019)**.This study aimed to assess the impact of nutrition education on the care practices of mothers/caregivers of children in IDP camps in Nigeria.

## Literature Review

Malnutrition is a significant public health problem in Nigeria, particularly among children under five years old **(National Bureau of Statistics [NBS], 2019)**. The prevalence of stunting, wasting, and underweight among children under five years old in Nigeria is 37%, 7%, and 22%, respectively **(NBS, 2019)**. Internally Displaced Persons (IDP) camps are vulnerable to malnutrition due to limited access to nutritious food, healthcare, and sanitation (United Nations Children's Fund **[UNICEF], 2020)**.

Nutrition education is a critical component of interventions aimed at improving nutrition outcomes in IDP camps **(Bhutta et al., 2018)**. Studies have shown that nutrition education can improve breastfeeding practices, complementary feeding practices, and dietary diversity among caregivers in IDP camps **(Adeniyi et al., 2020; Ogunniyi et al., 2019)**.

A systematic review of 17 studies on the effectiveness of nutrition education interventions in improving infant and young child feeding practices in developing countries found that nutrition education significantly improved exclusive breastfeeding rates, timely initiation of complementary feeding, and dietary diversity **(Imdad et al., 2011)**. Another study in Nigeria found that nutrition education improved caregivers' knowledge and practices related to infant and young child feeding **(Adebayo et al., 2018)**.

In IDP camps, nutrition education can be particularly effective in improving nutrition outcomes due to the vulnerable nature of the population **(UNICEF, 2020)**. A study in an IDP camp in northeast Nigeria found that nutrition education improved caregivers' knowledge and practices related to infant and young child feeding, leading to improved nutrition outcomes among children **(Adeniyi et al., 2020)**.

However, there are challenges to implementing nutrition education interventions in IDP camps, including limited access to healthcare services, lack of trained healthcare workers, and cultural and linguistic barriers **(Ogunniyi et al., 2019)**. Despite these challenges, nutrition education remains a critical component of

interventions aimed at improving nutrition outcomes in IDP camps.

The study was guided by the Health Belief Model (HBM), which posits that individuals' health behaviors are influenced by their perceived susceptibility to a health problem, perceived severity of the health problem, perceived benefits of taking action, and perceived barriers to taking action **(Rosenstock, 1974)**. In the context of nutrition education, the HBM suggests that caregivers' adoption of healthy feeding practices is influenced by their perceived susceptibility to malnutrition, perceived severity of malnutrition, perceived benefits of healthy feeding practices, and perceived barriers to healthy feeding practices.

The current study aimed to assess the impact of nutrition education on the care practices of mothers/caregivers of children in IDP camps in Nigeria. The study hypothesized that nutrition education would improve caregivers' knowledge and practices related to infant and young child feeding, leading to improved nutrition outcomes among children.

## Methodology

### *Area of Study*

This study was carried out in one Internally Displaced Persons camp each in Abuja, Borno and Bayelsa States. These States belong to three different geopolitical zones in Nigeria. Nigeria has six Geopolitical zones which are: North Central, North East, North West, South East, South South and South West Geopolitical Zones. The work was done in the following three geopolitical zones. North Central consisting of the following: Benue, Kogi, Kwara, Nasarawa, Niger, Plateau, Federal Capital Territory (Abuja). North East consisting of the following states: Adamawa, Bauchi, Borno, Gombe, Taraba, Yobe. South South Nigeria consisting of the following: AkwaIbom, Bayelsa, Cross River, Delta, Edo, Rivers State

### *Abuja IDP Camp*

Abuja is in the North Central Geopolitical Zone of Nigeria and is the capital of Nigeria, with a population of 3,464,123 and under five year old population of 692,825 ("World Demographics Profile, 2012). The IDP Camp selected for this project in the zone was the New Kuchingoro IDP Camp (caused by Boko Harm insurgence). The camp was purposively selected for this project due to accessibility and security reasons, the under five year old population in the camp could not be ascertained.

The New Kuchingoro IDP Camp Abuja, North-Central Nigeria has a Geo coordinate of ($9^0$00'24"N $7^0$27'19"E) 560m and it is situated at Housing society Kaura in Abuja. It is a suburb location in AMAC (Abuja Municipal Area Council) Local Government Area currently hosting over 1,723 Internally Displaced Persons (IDP), predominantly children. The persons were displaced in 2014 due to the insurgence in Borno. Although the village is an example of a settlement lacking in all the basic amenities needed for a modern living, it is one of the camps where most displaced persons across north east Nigeria take refuge.

Residents of the camp, reported that promises made to them on the provision of health care facilities and education for their children are yet to be fulfilled. The residents of the New Kuchingoro Internally Displaced Persons camp claimed that FEMA had previously issued them letters indicating that they could access healthcare services at the Asokoro District Hospital. This promise according to the women leader of the camp reported that the hospital demand money from them and always turn them back if could not pay.

### *Borno IDP Camp*

Borno is one of the states in the North Eastern Geopolitical Zones of the country Nigeria; its capital is the city of Maiduguri, with a population of about 5,860,200 with under five populationsof 1,172,040. Bakasi IDP Camp is situated in Borno due to the issues of Boko haram insurgence and Cameroun returnees, the under-five year old population in the BornoBakasi Camp is about 1,200 children, (Borno State overview Archived, 2012), the Camp was purposively selected for this project due to security reasons in the state.

Borno State Bakasi IDP Camp Maiduguri, North-east Nigeria has a Geo coordinate of ($11^0$47'21"N $13^0$06'59"E) 2.81 Km

The Borno State Bakasi Internally Displaced Persons camp is one of the old camps in Maiduguri, the state capital, the camp is located in Bakasi Housing estate, the site was originally built as the Borno State housing project. The camp houses residents from Monguno, Marte, Gwoza,

Guzamala and Nganzai LGAs of the State. The first residents of the camp were 4,763 persons displaced from Monguno.

There were Internally Displaced Persons from the Government College Camp and Arabic Teacher's College Camp in Maiduguri who relocated to the Bakasi site for shelter. This raised the camp population to almost 34,232 individuals who were displaced **("Borno State, Population Statistics, Charts, Map and Location, 2016)**. In 2017, some of the residents that are indigenes of Gwoza returned to their communities. However, following an attack in Marte LGA in the early 2019, some 202 households from Gwoza and Marte moved back to the camp. In June 2019 about 2,000 IDPs from Guzamala LGA started returning home citing improvement in security in their area of origin. The security situation in the camp is relatively stable with the site secured by the military, police, immigration services and the Civilian Joint Task Force (CJTF). The camp has however previously suffered several attempted and successful attacks, (Report gathered at the site). Due to the security risks, the Bakasi camp in Borno was purposively selected for the study.

***Bakassi Camp in Bayelsa State***

The third camp visited was the Bakassi IDP Camp in Bayelsa State with a Geo coordinate of ($4^0$55'05"N $6^0$17'47"E) 39m located in the South South Geopolitical Zone of Nigeria in the Niger Delta Region it has a total population of 2,198,872 and under five population of 439,774 (World Population Prospects, 2019), the Bayelsa Bakassi IDP Camp was caused by Cameroun Returnees, the under five year old population in the camp could not be ascertained. The camp was chosen because that was the largest and permanent IDP camp in the State, amongst the two other ones (ox-bow lake in Yenagoa and the Igbogene camp).

***Bayelsa State Bakassi IDP Camp in the South Southern Geopolitical Zone in Nigeria***

BayelsaBakassi camp was established in 2006 shortly after former President Olusegun Obasanjo ceded (surrender) the Bakassi Peninsular to the Cameroonian Government following a judgment by the **(Anyu, International court of justice and the border-conflict resolution in Africa, 2007)**. The ceding affected Bayelsa indigenes from different communities in the state, who were compelled to leave Bakassi and returned to Nigeria as refugees. The initial refugees were estimated to be about 8,000 and they were camped temporarily at the Samson Siasia Sports Complex in Yenagoa until those who could trace their communities returned home. Those that had no place to go were settled at a Bayelsa State Government land provided by the Okaka and Ekeki communities. At present the settlement has a population of over 1000 persons **(State Emergency Management Agency, (2008)**.

***Population of the Study***

The study population for this research was children aged 6months to 5years in each household in the Internally Displaced Persons (IDP) Camps in the three selected camps in each of the selected camps in Abuja, Borno and Bayelsa States.

***Sample Size Determination***

The Yaro Yamane's statistical formula (1967), was used to determine the sample size for this study

The sample size was determined using the formula below

$$n = \frac{N}{1+N(e)^2}$$

Where n = sample size

N = total population,

$e^2$ = error margin = $\frac{5\%}{100}$

***Calculation***

***Abuja under 5 total population is 692,825***

n = 692,825

$$n = \frac{692,825}{1+ 692825\ (0.05)^2} =$$

$$n = 1+692825\ (0.0025)\ \frac{692825}{}$$

$$= \frac{692825}{1+1733} = 399.7 = 400$$

The sample size of 400 respondents out of the entire population of 692,825 population size would be the lowest acceptable number of responses to maintain a 95% confidence level.

***Borno State***

n = 1,172,040

$$n = \frac{1,172,040}{1+ 1,172,040\ (0.05)^2}$$

$$n = \frac{1{,}172{,}040}{1+1{,}172{,}040\ (0.0025)}$$

$$= \frac{1{,}172{,}040}{1+2930}$$

$$= \frac{1{,}172{,}040}{2931} = 399.8 = 400$$

The sample size of 400 respondents out of the entire population of 1,172,040 population size would be the lowest acceptable number of responses to maintain a 95% confidence level.

***Bayelsa***

$$n = 439{,}774$$

$$n = \frac{439{,}774}{1+ 439{,}774\ (0.05)^2}$$

$$n = \frac{439{,}774}{1+439{,}774\ (0.0025)}$$

$$= \frac{439{,}774}{1+1099}$$

$$= \frac{439774}{1100} = 300.8 = 301$$

The sample size of 301 respondents out of the entire population of 439,774 population size would be the lowest acceptable number of responses to maintain a 95% confidence level.

**Table1: Population Sample for the Study household from each IDP**

| IDP Location | Total number of IDP Household | Total number of households selected | Total no of children 6 to 59 months |
|---|---|---|---|
| **Bayelsa (Bakassi Camp)** | 280 | 117 | 355 |
| **Borno (Bakasi Camp)** | 260 | 158 | 460 |
| **Abuja (New Kuchingoro Camp)** | 300 | 171 | 605 |
| **Total** | **840** | **446** | **1,420** |

***Source: (DTM Round, 2014; IOM, 2016) ( IOM-NEMA-SEMA 2014).***

***Study Design***

It was a cross sectional study, the objectives of this study was achieved through the following procedure

***Sample Selection***

A two-stage sampling technique was used to recruit participants into the study.

Stage 1: Three selected IDP camps of New Kuchingoro IDP camp in Abuja, Bakassi IDP Camp in Bayelsa and Bakasi IDP camp in Borno were identified and selected purposively by using a descriptive cross-sectional concept. All households with children aged 6 months to 5 years were selected and a random sampling was done on the households that had more than three children aged 6 months to 5years to select only three children from such households, this was done on the basis that not all the households had children of that age group, only 446 households had children aged 6 months to 5 years and 1,420 respondents were selected.

In the second stage, caregivers or mothers from the three selected IDP camps were gathered together in each of the camps, the study population were children aged 6 months to 5 years, but the caregivers or mothers of the children were the ones interviewed, while the anthropometric assessments was done on the children, the caregivers were those who have resided in the camps for a minimum of three years and were present in the camps at the time the study, but children and caregivers who just visited the camp at the time of this study were excluded.

There was a Preliminary visit: A preliminary visit to the camps was done a day before the study, to sensitize the caregivers and have a focus group discussion with them, also, an informed consent from the authorities in-charge of the camps was gotten, and the research assistants recruited and trained.

***Recruitment and training of research assistants***

Five health workers from nearby health facilities within proximity (Pearl Family Hospital, General Hospital in Munguno and Bayelsa Specialist Hospital for New Kuchingoro camp

Abuja, Bakasi camp in Borno and Bakassi camp in Bayelsa respectively) who communicate effectively in English, Hausa and ijaw languages were recruited and trained as research assistants on the methods of the questionnaire administration. The training was on the procedure for the anthropometric assessment, filling of the questionnaire, and how to report on the 24 hour dietary recall.

***Data collection and processing***

The Data collection was in two phases.

Phase I was the baseline data collection on anthropometric measurements (weight, height, length and MUAC measurements), dietary habits and dietary diversity, while

Phase II include data collection from all of the above after nutrition education to improve on the eating pattern was administered.

The study as well as the nutrition education and the revisit lasted for a period of 9 months.

***Phase I of the Study***

***Questionnaire Method***

The questionnaire was pretested; it was a semi-structured, interviewer-administered questionnaire which was used to obtain the respondents information on their socio-demographic, child care practices, clinical and anthropometric characteristics of the children. Information on the presence of locally and internationally nutrition interventions was gotten. Child care practices were evaluated using infant feeding practices, immunization and deworming status of the selected children. The Validity and reliability of the questionnaires were pre-tested at the Ox-Bow lake IDP camp in Bayelsa State with 50 respondents and there was some amendments made to re-structure the questions the ambiguous aspect of the questionnaire for the respondents. A total number of 1,420 questionnaires were distributed and all retrieved. Then, they were, collated and sorted out for the accuracy and completeness before leaving the camp at the end of the day's work.

***Dietary Diversity (DD)***

The information was collected by conducting an individual interview with the caregivers of the children aged 6-59 months. The caregivers were also asked t**he list of the meals** the children ate the previous day while checking the **meal composition** (e.g. pap with or without sugar and milk) and if **snacks were eaten** and if fruits were included. The caregivers were asked which foods the children ate from the other food groups that were not mentioned (e.g.Did she/he eat any egg yesterday?). The **number of consumed food groups,which** is known as the Individual Dietary Diversity Score, this was counted and the total dietary diversity were summed up.

The diversity of the respondent's diet was graded as low when less than or 4 food groups were eaten, rated as medium when 4-5 food groups were eaten, and high when more than >5 food groups were consumed.

**Table 2: Dietary diversity score**

| Low < 4 food groups | Medium 4- 5 food groups | High > 5 food |
|---|---|---|
| Cereals | Cereals | Cereals |
| Green leafy Vegetables | Green leafy vegetables | Green vegetables |
| Vitamin A Rich Fruits | Vit. A rich fruits | Vit. A rich fruits |
| | Oil | Oil<br>Others vegetables/fruit<br>Fish /Meat, Legumes, nuts, seeds |

**Source:** *Mayhlis.razes@fao.org, 2007*

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***Phase II of the study***

Data collection was conducted at the initial visit to the camp as in the phase I and the baseline of the study and this was repeated 8 weeks after the first visit and after the Nutrition Education which is the end-line, this is to improve on the eating pattern of the children, while healthy nutrition and health messages were delivered to the children's caregivers.

***Nutrition Education and Healthy Messages***

A baseline information of the caregiver's nutrition knowledge was gotten from the questionnaire, while the end-line information was gotten 8 weeks during the revisit assessment. The Nutrition Education intervention creates an impact on the caregivers' attitudes towards nutrition and their practices towards child nutrition.

The following messages were administered to the caregivers.

**Table A: message on the best time to eat**

| **Menu** | **Ideal Time** |
|---|---|
| **Breakfast**- Feed the children within 1hour 30 minutes of their waking up.- Ideal time to have breakfast is about 8am.<br>**Lunch**- Feed the children within 12.00 noon.<br>Lunch should be eaten about four to five hours after breakfast e.g. if breakfast is eaten 8am, lunch should be eaten between 12pm<br>Snacks: Feed the children at 3pm to 4pm with snacks in between | |
| Snack should be eaten in between breakfast and lunch if it is not possible to eat lunch until 2pm on a particular day.<br>**Snacks:** There should be snacks given to the childrenbetween the breakfast and lunch<br>**Dinner**.- The ideal time to have dinner is before 7pm. | |

**Table B: message on what happens when you skip a meal?**

**1.** Avoid skipping meals
- i. When meals are skipped, the blood sugar decreases and the brain uses glucose
- ii. If there is not enough glucose for the brain to use it affects the performance of the body function
- iii. This can cause irritability, confusion and fatigue. The body increases the production of cortisol, which leads to stress and hunger (an adrenal-cortex hormone, hydrocortone that is active in carbohydrate and protein metabolism).

**2.** When meals are skipped frequently without eating regularly, the body goes into survival mode (the body will look for how to survive). This will cause the cells of the body to crave for food and this can lead to craving for unhealthy foods.

**In summary skipping of meals;**

**a)** Help to lower the body's metabolism
**b)** This leaves the body with little energy
**c)** Leaves the children irritable, confused, fatigued, sluggish and weak

**Table C: message on strategies/tips to avoid skipping meals**

**1.** Feed the children small regular meals throughout the day to avoid skipping meals.
**2.** Always feed the children with snacks until the next meal.
**3.** Plan meals the previous day to be sure of the availability of food
**4.** Try to meet up with the meal timing

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**Table D: message on children care practices**

| |
|---|
| 1. **Breastfeeding-** the message was on initiating babies to breastfeeding within 60 minutes of birth, then exclusive breastfeeding for 6 months and continued breastfeeding for 2 years |
| **2. Complementary feeding-** is the introduction of the family food to the children from 6months of age |
| 3. **Giving the children drinking water-** Introducing drinking waterto the children should start at 6months during the complementary feeding period |
| 4. **De-worming-** the children should be taken to the health facility for de-worming exercise every 6months |
| 5. **Immunization-** all newborns should be taken to the health facility to receive the zero doses of vaccines and regular visit for the subsequent doses to achieve complete the full round of immunization, also to partake in the regular campaigns to receive the booster doses |

The women/caregivers were monitored, through calls to follow up in most cases to remind them and to ensure that they comply with the messages given to them

***Statistical Analysis***

In this study, the data entry and processing were done with the descriptive statistical analysis presented in frequency tables and percentages. Bivariate analysis was done with the Chi-square ($X^2$) test to determine the association between level of the nutrient intake of the respondents and the WHO/FAO Standard which shows that there is no association between the WHO/FAO daily nutrient requirement and the quantity consumed by the children. Students T-test was done to analyze the significance differences between the Nutrition educations on the Care Practices of the Selected Children before and after the Nutrition Education, as well as the two phases in the anthropometric measurements, food nutrient intakes, food proximate analysis as well and between the males and females children were done. An informed consent was gotten from the mothers and caregivers before the assessment. The method used in the determination of proximate compositions of the food samples is described in AOAC (2015) (Association of Official Analytical Chemists).

**Results**

Table 1 shows the care practices of the children by their caregivers, the responses from the caregivers indicates that all 100% children were breastfed, 72% gave their infants water before the age of 6months, while 28% started giving water from 6months of age. Only 8% were exclusively breastfed and 92% were not exclusively breastfed. About 85% started complementary feeding before the age of 6months and 15% started complementary feeding from 6months. About 16% were de-wormed in the past 6months while 1,196 children were not de-wormed, 39% were immunized with their immunization cards while 61% were not immunized. A total number of 21% had no record of immunization of their children, 22% had their immunization record up to date, and 17% had completed their immunization while 40% did not complete their immunization at the time of assessment. After the nutrition education 15% of the respondents exclusively breastfed their children while 85% already introduce drinking water to their children, 57% caregivers took their children to the health facilities for de-worming, while 43% were yet to. A total of 32% caregivers had taken their children for the complete course of immunization while 23% caregivers were yet to. The association between the nutrition education and responses in respect to whether children have ever been breastfed, and also the age of the child when water was introduced, and the age when complementary foods was introduced and whether immunization card was seen, exhibit an insignificant relationship as their p-values were consistently above 0.05 while responses in respect to whether the children were exclusively breastfed and de-wormed in the past 6 months and immunization status was based on if the immunization card was sited associated significantly as shown in table.

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**Table 1: Care Practices of the Children before and after Nutrition Education**

| | Before Nutrition Education (A) | | After Nutrition Education (B) | | | |
|---|---|---|---|---|---|---|
| **Variables (N=1420)** | **Freq (n)** | **%** | **Freq (n)** | **%** | **P-value** | **$X^2$** |
| **a) Children ever breastfed** | | | | | | |
| Yes | 1420 | 100 | 1420 | 100 | 1.000 | 0.000[aa] |
| No | 0 | 0 | 0 | 0 | | |
| **b) Age of child when water was introduced** | | | | | | |
| Before 6 months | 1017 | 72 | 1017 | 72 | 1.000 | 0.000[ab] |
| At 6 months | 403 | 28 | 403 | 28 | 1.000 | |
| **c) Exclusively breastfed** | | | | | | |
| Yes | 108 | 8 | 213 | 15 | 0.000 | |
| No | 1312 | 92 | 1207 | 85 | 0.036 | |
| **d) Age of child when complementary foods was introduced** | | | | | | |
| Before 6 months | 1205 | 85 | 1205 | 85 | 1.000 | 0.000[af] |
| At 6 months | 215 | 15 | 215 | 15 | 1.000 | |
| **e) Children de-wormed in the preceding 6 months** | | | | | | |
| Yes | 229 | 16 | 807 | 57 | 0.000 | |
| No | 1196 | 84 | 613 | 43 | 0.000 | |
| **f) Immunization card seen** | | | | | | |
| Yes | 558 | 39 | 558 | 39 | 1.000 | 0.000[aj] |
| No | 862 | 61 | 862 | 61 | 1.000 | 0.000[ak] |
| **Immunization status was based on if the immunization card was sited** | | | | | | |
| None | 305 | 21 | 250 | 18 | 0.020 | |
| Up to date | 313 | 22 | 389 | 27 | 0.004 | |
| Completed | 242 | 17 | 456 | 32 | 0.000 | |
| Not completed | 560 | 40 | 325 | 23 | 0.000 | |

Table 2 shows the Mid Upper Arm Circumference (MUAC) reading of less than 11.5cm (showing Red) were considered as Severely Malnourished (SAM), those with MUAC measurements between 11.5cm and 12.5cm (showing yellow) were considered Moderately Malnourished (MAM), while those with MUAC measurements from 12.6cm and above (showing green) were considered Normal.

The percentages of normal children for weight for age were 5.3% underweight for male, while 4.4% were underweight for female, 2.1% were severely underweight for males and 2.0% were severely underweight for female.

For Height for Age index a total of 5.6% were stunted for male and 5.3% stunted for females, about 2.3% were severely stunted for male and 2.1% were severely stunted for female.

For Weight for Height index 4.7% were wasted for male and 4.5% were wasted for females, 2.9% were severely wasted for male, and 2.8% also severely wasted for female. The result shows a negative z-score for all the variables under consideration which is an indication that the observations are below the mean for sample. Also, the standard deviation values for all the variables are less than their mean z-score which indicates that the observations are not widely dispersed.

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**Table 2: Prevalence of malnutrition among the children**

| | Before Nutrition education | | | |
|---|---|---|---|---|
| **Population Size (N=1420)** | **Sex** | | | |
| **Variables** | **Male n (%)** | **Female n (%)** | **Total n (%)** | **SD** |
| **WAZ (underweight)** | **813(57.2%)** | **607(42.7%)** | **1420(100)** | **0.49488** |
| Normal (> -2.0 SD) | 401(28.2) | 385(27.1) | 786(55.3) | 0.50021 |
| Undernutrition (-2.0 to -3.0 SD) | 76(5.3) | 63(4.4) | 139(9.8) | 0.49961 |
| Severe undernutrition (< -3.0 SD) | 31(2.1) | 30(2.0) | 61(4.1) | 0.50408 |
| **HAZ (Stunting)** | **813 (57.2)** | **607(42.7)** | **1420(100)** | **0.49488** |
| Normal (> -2.0 SD) | 401(28.2) | 385(27.1) | 786(55.3) | 0.50021 |
| Stunting (-2.0 to -3.0 SD) | 80(5.6) | 76(5.3) | 156(10.9) | 0.50145 |
| Severe stunting (< -3.0 SD) | 33(2.3) | 31(2.1) | 64(4.5) | 0.50371 |
| **WHZ (Wasting)** | **813(57.2)** | **607(42.7)** | **1420(100)** | **0.49488** |
| Normal (> -2.0 SD) | 401(28.2) | 385(27.1) | 786(55.3) | 0.50021 |
| Wasting (-2.0 to -3.0 SD) | 68(4.7) | 65(4.5) | 133(10.3) | 0.50176 |
| Severe wasting (< -3.0 SD) | 41(2.9) | 40(2.8) | 81(5.7) | 0.50308 |

Table 3 shows the percentages of children after 8weeks of the nutrition education were 56.5% males and 43.4% for females. The Weight for Age index showed that 2.1% were under nourished for male, while 1.5% under nourished for female, 1.4% were severely under nourished for males and 1.1% severely under nourished for female. After the 8 weeks of nutrition education the %age of severely underweight children dropped from 4.1% to 2.5% with the probability value of 0.05. For Height for Age index a total of 5.4% were stunted for male and 5.1% stunted for females, about 2.3% were severely stunted for male and 1.9% were severely stunted for female. After the 8 weeks of nutrition education the %age of severely stunted children remained the same with the probability value of 0.05. For Weight for Height index 1.7% were wasted for male and 1.5% were wasted for females, 1.5% were severely wasted for male, and 1.3% also severely wasted for female. After the 8 weeks of nutrition education the %age of severely wasted children dropped from 5.7% to 2.8%.

**Table 3: Malnutrition Prevalence by Anthropometric indices of the Children (endline)**

| | After the nutrition education (8wks after) | | | | |
|---|---|---|---|---|---|
| **Population Size (N=1380)** | **Sex** | | **Total** | **p-value** | |
| **Variables** | **Male n (%)** | **Female n (%)** | | | |
| **Weight for age** | **710(51.4)** | **670(48.5)** | **1380(100%)** | | |
| Normal (> -2.0 SD) | 571(41.4) | 430(31.1) | 1001(72.5) | | |
| Undernutrition (-2.0 to -3.0 SD) | 28(2.0) | 22(1.5) | 50(3.6) | | |
| Severe undernutrition (< -3.0 SD) | 20(1.4) | 15(1.1) | 35(2.5) | 0.05 | |
| **Height for age** | **710(56.5)** | **670(48.5)** | **1380(100)** | | |
| Normal (> -2.0 SD) | 571(41.4) | 430(31.1) | 1001(72.5) | | |
| Stunting (-2.0 to -3.0 SD) | 75(5.4) | 70(5.1) | 145(10.5) | | |
| Severe stunting (< -3.0 SD) | 33(2.3) | 27(1.9) | 60(4.3) | 0.05 | |
| **Weight for height** | **710(56.5)** | **670(48.5)** | **1380(100)** | | |
| Normal (> -2.0 SD) | 571(41.4) | 430(31.1) | 1001(72.5) | | |
| Wasting (-2.0 to -3.0 SD) | 24(1.7) | 21(1.5) | 45(3.2) | | |
| Severe wasting (< -3.0 SD) | 21(1.5) | 19(1.3) | 40(2.8) | 0.05 | |

**Before nutrition education:** Table 4 shows that 1,420 children were assessed during the first assessment, about 55.3% children were normal, 9.8% undernourished and 4.1% severely undernourished. About 10.9% were stunted and 4.5% severely stunted. An estimated number of 7.3% were wasted and 5.7% severely wasted.

**After the nutrition education (8wks):** A total of 1,380 children were assessed due to non-availability of the children in the camps and death cases reported among the children, about 72.5% children were normal, 3.6% undernourished and 2.5% severely undernourished. About 10.5% were stunted and 4.3% severely stunted (some of the stunted children were not seen at the time of revisit). An estimated number of 3.2% were wasted and 2.8% severely wasted. The chi-square analysis showed that the association between the anthropometric indices and nutrition education were significant (P-value do not show that they are underweight and severely undernourished).

**Table 4: Chi-square analysis between the Anthropometric indices of the Children and nutrition education**

| Variables | Before nutrition education % | After nutrition education (8wks) % | Mean Z-Score | P-value | $X^2$ |
|---|---|---|---|---|---|
| **Weight for age** | **100** | **100** | -1.17197 | 0.450 | |
| Normal (> -2.0 SD) | 55.3 | 72.5 | -0.59817 | | |
| Undernutrition (-2.0 to -3.0 SD) | 9.8 | 3.6 | | | |
| Severe undernutrition (< -3.0 SD) | 4.1 | 2.5 | | | 7.042[c] |
| **Height for age** | **100** | **100** | -0.6167 | 0.450 | |
| Normal (> -2.0 SD) | 55.3 | 72.5 | | | |
| Stunting (-2.0 to -3.0 SD) | 10.9 | 10.5 | | | |
| Severe stunting (< -3.0 SD) | 4.5 | 4.3 | | 0.010 | 6.627[e] |
| **Weight for height** | **100** | **100** | -0.75249 | | |

| | | | | | |
|---|---|---|---|---|---|
| Normal (> -2.0 SD) | 55.3 | 72.5 | | | |
| Wasting (-2.0 to -3.0 SD) | 7.3 | 3.2 | | | |
| Severe wasting (< -3.0 SD) | 5.7 | 2.8 | | 0.004 | 8.182[g] |

Table5 shows the mean Z-Score anthropometric indices of the children according to their sex. It also shows the mean anthropometric z-scores indices of the children were -1.553 for male and -1.198 for female weight for age index, -1.781 for height for age index for the males and -1.372 for weight index for the females. There was no significance difference between the male and female children in all the anthropometric Z-Score indices p- 0.05.

**Table 5: Mean Z-Score Anthropometric Characteristics of the children**

| **Variables** | Mean (SD) Male | Mean (SD Female | | P-value | |
|---|---|---|---|---|---|
| **Weight for age** | 813 | 401 | | | |
| | -1.553±1.01 | -1.198±1.23 | | 0.05 | |
| **Height for age** | 813 | 401 | | | |
| | -1.781±2.10 | -1.372±1.94 | | 0.05 | |
| **Weight for height** | 813 | 401 | | | |
| | 1.113±2.41 | 1.010±2.20 | | 0.05 | |

Before nutrition education: Table 6 shows the Comparison between the WHO/FAO daily nutrient requirement and the quantity consumed by the children per 100gm of food, the table shows that 228.4g of carbohydrate is the daily requirement for the respondent, while 114g was consumed, 67.5g of protein is required while 56gm was consumed, 34.5g of fat/oil is required, while 28g was consumed, 350kj of energy required while 280kj was consumed and 5.0mg of zinc is required, while 3.7mg consumed.

After nutrition education (8wks):Table 4.4 also showsthe Comparison between the initial daily nutrient consumption and the resent daily consumption and it was noted that there was an improvement in their daily nutrient consumption. The table shows that 124g of carbohydrate was consumed, 66g of protein was consumed, while 34g of fat/oil was consumed, 420mg of calcium was consumed and 8.0mg of iron. A total of 300kj of energy and 148µg of Vitamin A consumed, and 3.8mg of zinc while 15.2gm of dietary fiber was consumed.

The table also displays the standard deviation and the p-values of the daily nutrient requirements and the quantity consumed by the children's per 100gm of food. The result shows high values for all the variables which indicate high deviation from the mean of the sample except iron that shows zero dispersion. Also, for all the variables, the p-values are greater than 0.05 and indicates that the variables are insignificantly related in the before and after the nutrition education except calcium that is significantly related with p-value less than 0.05.

Furthermore, the table displays the p-values and t-test values of daily nutrient requirement and the quantity consumed by the respondents in 24 hours dietary. The result shows that for majority of the nutrients the p-values are greater than 0.05 which indicates that the nutrients are insignificantly related in the before and after nutrition education except Calcium (mg) which has lower p-values indicating a significantly relationship between before and after nutrition education. Also, the statistics validates the above finding as the calculated t-test values for Carbohydrate (g), Energy (kj), Protein (g), Zinc (mg), Iron (mg), Vitamin A (µg), and Dietary Fiber (gm) are greater than the tabulated t-test value of 12.71 at level of significance 0.05 with 1 as the degree of freedom (df), and this indicates an insignificant relationship between the before and after nutrition education. However, Fat/oil (g) and Calcium (mg) exhibit a significant relationship between the before and after nutrition education as their calculated t-test values are lower than the tabulated t-test value of 12.71 at 0.05 level of significance and degree of freedom (df) of 1.

**Table 6: Mean Nutrient Daily Intake of the children expressed % met of WHO/FAO standard**

| | Before nutrition education | | After nutrition education | P-Value | t-test |
|---|---|---|---|---|---|
| **Nutrient** | **Amount consumed in 24hr dietary recall** | **WHO/FAO daily Standard per 100gm** | **Amount consumed in 24hr dietary recall** | **0.05** | |
| Carbohydrate (g) | 114 ± 0.501(49.9%) | 228.4 g | 124 ± 0.501 (54.2%) | 0.517 | 23.800 |
| Protein (g) | 56 ± 0.500 (83.0%) | 67.5 g | 66 ± 0.500 (97.7%) | 0.365 | 12.200 |
| Fat/oil (g) | 28 ± 0.502 (81.1%) | 34.5 g | 34 ± 0.502 (98.5%) | 0.446 | 10.333 |
| Calcium(mg) | 350 ± 0.000 (60.0%) | 583 mg | 420 ± 0.000 (72.0%) | 0.012 | 11.000 |
| Iron (mg) | 7.0 ± 0.516 (72.9%) | 9.6 mg | 8.0 ± 0.516 (83.3%) | 0.796 | 15.000 |
| Energy(kj) | 280 ± 0.000 (80%) | 350 kj | 300 ± 0.000 (85.7%) | 0.406 | 29.000 |
| Vitamin A (µg) | 142 ± 0.492 (85.5%) | 166 µg | 148 ± 0.492 (89.1%) | 0.725 | 48.333 |
| Zinc (mg) | 3.7 ± 0.535 (74%) | 5.0 mg | 3.8 ± 0.535 (76.0%) | 1.000 | 75.000 |
| Dietary Fiber (gm) | 14.2 ± 0.509 (81.6%) | 17.4 gm | 15.2 ± 0.509 (87.3%) | 0.853 | 29.400 |

Table 7 shows the food consumption pattern of the children, 25.8% ate once daily. About 15.0% ate twice daily, while 7.6% do not, 29.2% ate three times daily, while 8.5% gave other foods like snacks during the day. About 6.0% did exclusive breastfeeding while 10.7% did not do exclusive breastfeeding, 11.8% gave breast milk on demand by the children. A total of 7.6% breastfed their babies up till 24 months of age. An estimated number of 10.6% gave drinking water at least 4 times daily. About 38.2% regularly skipped meals, 38.2% were restricted from eating some meals. Caregivers of 3.1% of the children refused eating certain food while 0.4% vomited most of the time.

**Table 7: The feeding practices of the children**

| | Feeding Practices | Yes | % | No | % | Total | % |
|---|---|---|---|---|---|---|---|
| **A** | **Household meal frequency Number of meals eaten per day** | | | | | | |
| | Once | 82 | 5.8 | 138 | 9.7 | 220 | 15.5 |
| | Twice | 212 | 15.0 | 108 | 7.6 | 320 | 22.5 |
| | Thrice | 416 | 29.2 | 135 | 9.5 | 551 | 38.8 |
| | Others (Snacks) | 120 | 8.5 | 209 | 14.7 | 329 | 23.2 |
| **B** | **Breastfeeding** | | | | | | |
| | Exclusive breastfeeding | 86 | 6.0 | 104 | 7.3 | 190 | 13.4 |
| | No exclusive breastfeeding | 152 | 10.7 | 146 | 10.3 | 298 | 21.0 |
| | Breast milk given on demand | 168 | 11.8 | 192 | 13.5 | 360 | 25.4 |
| | Breast milk continued till 24 | 108 | 7.6 | 110 | 7.7 | 218 | 15.4 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | months | | | | | | |
| | Drinking of water at least 4 times daily | 150 | 10.6 | 204 | 14.4 | 354 | 25.0 |
| **C** | **Adequacy of seasonal foods** | | | | | | |
| | During rainy season | 418 | 29.4 | 312 | 22.0 | 730 | 51.4 |
| | During dry season | 402 | 28.3 | 288 | 20.3 | 690 | 48.6 |
| **D** | **Eating Behavior** | | | | | | |
| | Regular skipping of meal | 542 | 38.2 | 88 | 6.2 | 630 | 44.4 |
| | Restricting/restraining eating | 432 | 30.4 | 112 | 7.9 | 544 | 38.3 |
| | Refusing to eat certain type of food | 140 | 9.9 | 50 | 3.5 | 190 | 13.4 |
| | Refusing to eat or swallow any food | 44 | 3.1 | 4 | 0.2 | 48 | 3.4 |
| | Vomiting when eating | 6 | 0.4 | 2 | 0.1 | 8 | 0.5 |

Table 8 presents the feeding practices of the under 5 children before the nutrition education. Analysis of the weekly consumption dietary recall shows that 58.8% of the children consumed cereals, 35.1% consumed roots and tubers, 48.1% consumed fruits and vegetables, 10.5% ate meat and poultry, 3.8% ate eggs, while 10.4% ate fish and sea foods, 12.0% ate pulses/legumes/nuts, while 3.2% ate milk and milk products, 6.0% consumed oils/fats while 16.5% consumed sugar.

**Table 8: Food Group consumption pattern of the children before Nutrition Education(n=1420)**

| **Food groups** | **Male (freq %)** | **Female (freq %)** | **Total (%)** |
|---|---|---|---|
| **Cereals** | | | |
| 3-5 times | 11(0.7) | 9(0.6) | 20(1.4) |
| 1-2 times | 390(27.4) | 425(29.9) | 815(57.3) |
| **Total** | **401(28.2%)** | **434(30.5)** | **835(58.8)** |
| **Roots and tubers** | | | |
| 3-5 times | 24(1.6) | 20(1.4) | 44(3.0) |
| 1-2 times | 230(16.0) | 226(15.9) | 456(32.1) |
| **Total** | **254(17.8)** | **246(17.3)** | **500(35.1)** |
| **Vegetables/fruits** | | | |
| 3-5 times | 33(2.3) | 31(2.1) | 64(4.5) |
| 1-2 times | 312(21.9) | 309(21.7) | 621(43.7) |
| **Total** | **345(24.2)** | **340(23.9%)** | **685(48.1)** |
| **Meat/Poultry** | | | |
| 3-5 times | 7(0.4) | 8(0.5) | 15(1.0) |
| 1-2 times | 69(4.8) | 70(4.9) | 139(9.7) |
| **Total** | **73(5.1)** | **78(5.4)** | **154(10.5)** |
| **Eggs** | | | |
| 3-5 times | 2(0.1) | 5(0.3) | 7(0.4) |
| 1-2 times | 18(1.2) | 29(2.0) | 47(3.3) |
| **Total** | **20(1.4)** | **34(2.3)** | **54(3.7)** |
| **Fish and Sea foods** | | | |
| 3-5 times | 30(2.1) | 29(2.0) | 59(4.1) |

| | | | |
|---|---|---|---|
| 1-2 times | 48(3.3) | 51(3.5) | 99(6.9) |
| **Total** | **78(5.4)** | **80(5.0)** | **158(10.4)** |
| **Pulses/Legumes/Nuts** | | | |
| 3-5 times | 6(0.4) | 5(0.3) | 11(0.8) |
| 1-2 times | 28(1.9) | 32(2.2) | 60(4.2) |
| **Total** | **34(9.4)** | **37(2.6)** | **71(12.0)** |
| **Milk and Milk Products** | | | |
| 3-5 times | 4(0.2) | 6(0.4) | 10(0.7) |
| 1-2 times | 31(2.1) | 34(9.4) | 65(4.5) |
| **Total** | **35(2.4)** | **40(2.8)** | **75(5.2)** |
| **Oils/Fats** | | | |
| 3-5 times | 7(0.4) | 7(0.4) | 14(0.9) |
| 1-2 times | 36(2.5) | 37(2.6) | 73(5.1) |
| **Total** | **43(3.0)** | **44(3.0)** | **87(6.0)** |
| **Sugar** | | | |
| 3-5 times | 22(1.5) | 30(2.1) | 52(3.6) |
| 1-2 times | 79(5.5) | 104(7.3) | 183(12.8) |
| **Total** | **101(7.1)** | **134(9.4)** | **235(16.5)** |

Table 9 shows the food group consumption of the children after the nutrition education indicates that 68.6% of the children ate cereals, within the specified 24hrs, 41.0% consumed roots and tubers, 56.3% consumed fruits and vegetables. A total of 13.9% consumed meat and poultry, 6.9% consumed eggs, while 16.5% consumed fish and sea foods, 12.0% ate pulses/legumes/nuts, while 10.5% ate milk and milk products, and 11.7% consumed oils/fats while 27.9% consumed sugar.

**Table 9: Food Group consumption pattern of the children after Nutrition Education (n=1380)**

| Food groups | Male (freq %) | Female (freq %) | Total (%) |
|---|---|---|---|
| **Cereals** | | | |
| 3-5 times | 41(2.9) | 40(2.8) | 81(5.8) |
| 1-2 times | 440(31.8) | 426(30.8) | 866(62.7) |
| **Total** | **481(34.8)** | **466(33.7)** | **947(68.6)** |
| **Roots and Tubers** | | | |
| 3-5 times | 42(3.0) | 37(2.6) | 79(5.7) |
| 1-2 times | 252(18.2) | 235(17.0) | 487(35.2) |
| **Total** | **294(21.3)** | **272(19.7)** | **566(41.0)** |
| **Vegetables/Fruits** | | | |
| 3-5 times | 33(2.3) | 31(2.2) | 64(4.6) |
| 1-2 times | 366(26.5) | 347(25.1) | 713(51.6) |
| **Total** | **399(28.9)** | **378(27.3)** | **777(56.3)** |
| **Meat/Poultry** | | | |
| 3-5 times | 21(1.5) | 23(1.6) | 44(3.1) |
| 1-2 times | 80(5.7) | 69(5.0) | 149(10.7) |
| **Total** | **101(7.3)** | **92(6.6)** | **193(13.9)** |
| **Eggs** | | | |
| 3-5 times | 5(0.3) | 9(0.6) | 14(1.0) |
| 1-2 times | 36(2.6) | 45(3.2) | 81(5.8) |
| **Total** | **41(2.9)** | **54(3.9)** | **95(6.8)** |
| **Fish and sea foods** | | | |

| | | | |
|---|---|---|---|
| 3-5 times | 34(2.4) | 25(1.8) | 59(4.2) |
| 1-2 times | 94(6.8) | 75(5.5) | 169(12.2) |
| **Total** | **128(9.2)** | **100(7.2)** | **228(20.8)** |
| **Pulse/Legumes/Nuts** | | | |
| 3-5 times | 32(2.3) | 27(1.9) | 59(4.2) |
| 1-2 times | 56(4.1) | 51(3.6) | 107(7.7) |
| **Total** | **88(6.3)** | **78(5.6)** | **166(12.0)** |
| **Milk and Milk Products** | | | |
| 3-5 times | 24(1.7) | 22(1.6) | 46(3.3) |
| 1-2 times | 51(3.6) | 48(3.4) | 99(7.1) |
| **Total** | **75(5.5)** | **70(5.0)** | **145(10.5)** |
| **Oils/Fats** | | | |
| 3-5 times | 32(2.3) | 24(1.7) | 56(4.1) |
| 1-2 times | 56(4.1) | 50(3.5) | 106(7.6) |
| **Total** | **88(6.3)** | **74(5.4)** | **162(11.7)** |
| **Sugar** | | | |
| 3-5 times | 57(4.2) | 44(3.1) | 101(7.3) |
| 1-2 times | 144(10.4) | 140(10.1 | 284(20.5) |
| **Total** | **201(14.5** | **184(13.3)** | **385(27.8)** |

Table 10 shows the dietary diversity was analyzed from the 24hour dietary recall, this was done by summing up the number of the food groups consumed during the past 24 hours. The food groups were considered were at a minimum of four food groups and a point was recorded to each food group that was consumed over the reference period and the sum of all the groups were summed up for the diversity of the children diet. The diversities were classified into low, medium and high respectively as shown below.
Table 9 also shows that 28.3% of the children consumed minimum of 4 food groups in the last 24 hours, 5.9% consumed about 4 - 5 food groups, while 35.8% consumed more than 5 food groups in the last 24hours.

**Table 10: Diversity of the Children's Diet before Nutrition Education**

| Dietary Diversity | Male (Freq) | Male (%) | Female (Freq) | Female (%) | Total (Freq) | Total (%) |
|---|---|---|---|---|---|---|
| < 4 (Low) | 200 | 14.1 | 203 | 14.2 | 403 | 28.3 |
| 4–5 (Medium) | 252 | 17.7 | 257 | 18.1 | 509 | 35.9 |
| > 5 (High) | 238 | 16.8 | 270 | 19.1 | 508 | 35.8 |
| **Total** | **690** | **48.6** | **730** | **51.4** | **1420** | **100** |

Table 11 shows the dietary diversity of < 4 (Low) was insignificant (p-value = 1 > 0.05; $X^2 = 0.000$) which shows that the children's diet before and after the nutrition education was insignificantly related. Also, the dietary diversity of 4-5 (medium) was insignificant (p-value = 1 > 0.05; $X^2 = 4.086$) which shows that the children's diet before and after the nutrition education was insignificantly related and the diversity of >5 (High) was insignificant (p-value = 1 > 0.05; $X^2 = 4.086$) which shows that children's diet before and after the nutrition education was also insignificantly related.

**Table 11: Comparison of the Dietary Diversity of the Children's Diet Before and After Nutrition Education**

| Dietary Diversity | Before (Freq) | Before (%) | After (Freq) | After (%) | $\chi^2$ value | P-value |
|---|---|---|---|---|---|---|
| < 4 (Low) | 403 | 28.3 | 261 | 18.9 | – | – |
| 4–5 (Medium) | 509 | 35.9 | 547 | 39.7 | 4.086 | 0.05 |
| > 5 (High) | 508 | 35.8 | 572 | 41.5 | 4.086 | 0.05 |
| **Total** | **1420** | **100** | **1380** | **100** | | |

Table 12 shows that the poor sanitation and hygiene situation of the camp was high, about 88.4% of the respondents had while 11.6% did not have poor sanitation and hygiene situation. About 15.6% used tap water, there was no stream water in the three IDP Camps visited and about 22.4% used water from the well while 89.6% used water from the borehole. Most of the respondents 94.0% were affected by poor diet both in quantity and quality, while 6.0% were not affected. Most, 92.8% have low monthly cash income, and this affect their purchase of food and food items, 35.5% had poor medical accessibility which affects their health outcome.

**Table 12: Causal factors of malnutrition and other risk factors**

| | | Yes | % | No | % |
|---|---|---|---|---|---|
| **a** | **Direct Factors** | | | | |
| | **Environmental quality** | | | | |
| | Poor sanitation and hygiene | 1255 | 88.4 | 165 | 11.6 |
| | **Sources of water supply** | | | | |
| | Tap | 222 | 15.6 | 1198 | 84.4 |
| | Borehole | 1272 | 89.6 | 148 | 10.4 |
| | Stream | 0 | 0 | 1420 | 100.0 |
| | Well | 318 | 22.4 | 1102 | 77.6 |
| **b** | **Food quality, quantity and variety are adequate** | | | | |
| | Poor diet intake (Quality and quantity) | 1335 | 94.0 | 85 | 6.0 |
| | Lack of variety of food (scarcity of food) | 1335 | 94.0 | 85 | 6.0 |
| | Lack of appetite | 61 | 4.3 | 1359 | 95.7 |
| | Disrupted digestion | 0 | 0 | 1420 | 100.0 |
| **c** | **Economic/financial capability** | | | | |
| | Maternal factor illiteracy | 263 | 18.5 | 1157 | 81.5 |
| | Low monthly cash income | 1318 | 92.8 | 102 | 7.2 |
| | Social inequality | 209 | 14.7 | 1211 | 85.3 |
| **d** | **Quality Health and medical** | | | | |
| | Poor medical Accessibility | 504 | 35.5 | 916 | 64.5 |
| | Episodes of diarrhoea | 124 | 8.7 | 1296 | 91.3 |
| **e** | **Adequacy of infrastructure in IDP camps** | | | | |
| | Clinic | 1246 | 87.7 | 174 | 12.3 |
| | School | 546 | 38.5 | 871 | 61.3 |
| | Toilets | 1211 | 85.3 | 209 | 14.7 |
| | **Water** | | | | |
| | Presence of water | 996 | 70.1 | 424 | 29.9 |

| | | | | | |
|---|---|---|---|---|---|
| | Absence of water | 424 | 29.9 | 996 | 70.1 |
| | **Electricity** | | | | |
| | Presence of electricity | 664 | 46.8 | 756 | 53.2 |
| | Absence of electricity | 756 | 53.2 | 664 | 46.8 |

Table 13 shows that the nutritional interventions received at the camps, just satisfied the nutritional needs of 5.8%, while 94.2% are not satisfied, the feeding group most affected with the inadequate food are 93.2% children. The food availability in the camp is effective for 4.0% of the children, the assistance provided for the caregivers are totally free for them. There are teaching of skills for 37.5% of the caregivers while 62.7% do not have teaching skills, none of the respondents are marginalized.

**Table 13: Adequacy of intervention Strategy**

| | **Adequacy of intervention strategy** | **Yes** | **%** | **No** | **%** |
|---|---|---|---|---|---|
| **1** | **Relevance** | | | | |
| | Satisfies nutritional need | 83 | 5.8 | 1337 | 94.2 |
| | Feeding group most affected (children) | 1324 | 93.2 | 96 | 6.8 |
| | Addresses cause of malnutrition | 57 | 4.0 | 1363 | 96.0 |
| **2** | **Effectiveness of intervention strategy** | | | | |
| | Provides food availability in the camp | 57 | 4.0 | 1363 | 96.0 |
| | Food provided is highly utilized | 1335 | 94.0 | 85 | 6.0 |
| **3** | **Sustainability:** | | | | |
| | Brings diversification of sources of food and income | 907 | 63.9 | 513 | 36.1 |
| | Trains in skill acquisition | 816 | 57.5 | 604 | 42.5 |
| | Food security | 0 | 0 | 1420 | 100.0 |
| **4** | **Cost recovery** | | | | |
| | Assistance totally free | 1420 | 100.0 | 0 | 0 |
| | Is there any payback recovery | 0 | 0 | 1420 | 100.0 |
| **5** | **Beneficial to host community** | | | | |
| | Any teaching of skills to host community | 532 | 37.5 | 890 | 62.7 |
| | Any building of infrastructures | 777 | 54.7 | 643 | 45.3 |
| | Any empowerment/jobs given to host community | 0 | 0 | 1420 | 100 |
| **6** | **Gender issue/demography** | | | | |
| | Marginalization of some groups | 232 | 16.3 | 1188 | 87.7 |
| | No marginalization | 1188 | 83.7 | 232 | 16.3 |

**Interventions received at the camps**

The Government and the Non-Governmental Organizations are not giving enough nutritional support to the IDPs. Below are some of the information on the interventions received from the respondents

**The Federal Government**

The Acting Director of the Humanitarian Affairs Department of the Ministry, Dr. Abubakar Suleiman, delivered some relief materials to the Abuja IDP Camps which include nutritional and non-nutritional interventions, the items include

i. 50 bales of clothes
ii. 20 cartons of body cream.
iii. 200 kegs of palm oil
iv. 600 bags of rice (25 kg)
v. 10 sacks of rubber slippers

During the assessment visit of the Minister to the camp, he called on well-meaning Nigerians

to join hands with the Federal and State Government to give support materials to displaced communities in the society. (Federal Ministry of Culture and Information, 2021)

Nigerian Content Development and Monitoring Board donated relief materials to the internally displaced person's camps in Bayelsa State to reduce the suffering of the people.

Items delivered to the IDP camps in Bakassi, Igbogene and Oxbow Lake IDP Camps of Yenagoa and its environs include:

i. Bags of rice
ii. Bags of garri
iii. Cartons of spaghetti
iv. Sugar
v. Salt
vi. Palm oil
vii. Groundnut oil
viii. Mosquito nets
ix. Mattresses
x. Others

The distribution of the materials formed part of the visit by the Minister of State for Petroleum Resources, in 2017

According to **Save the Children, (2017),** the World Food Programme (WFP) and other organizations, food commodities were identified as the most important needs by IDPs across the three Local Government Areas in Borno State. This was followed by health commodities, shelter, and potable water, but out of desperation, Internally Displaced People (IDPs) in Borno, Northeast Nigeria, sell some of the foodstuff and non-food items that were donated to them and using the money to buy other essential items, (information from the focal group discussion). The situation was warranted due to some institutional challenges in the humanitarian programmes, this was a misplacement of priorities, as well as irregularities in the distribution of relief materials.

There is the monthly feeding allowance for about 200 IDPs in the camps and other communities in Borno and Adamawa.

**Non-Governmental Nutrition Intervention at the camps**

The World Food Programme (WFP) provide some support to address food security to the IDPs in the North east, by distributing fertilizers and seedlings to encourage food security.

The United Nations agency has tried to shift focus away from direct donation of food items to cash-based transfers (CBTs) to the IDPs. Beneficiaries are given cash or sometimes tickets about N17,000 monthly in the persons.

National Emergency Management Agency (NEMA), National Commission for Refugees Migrants provides the following to the IDP Camps in Abuja and the Borno

i. Foodstuff
ii. Detergents
iii. Clothes
iv. Wrappers
v. Mattresses
vi. Others.

**Discussion**

The age of the respondents for this study was children between the ages of 6months to 5years which was fitting for the purpose of this study which aims at evaluating the nutritional status of the displaced children at the three IDP camps studied. There were more male children (57%) than female (47%) who were within the age bracket used for this study. Most of the children in this study were still breastfeeding and some were already eating solid foods, hence their food samples were collected for food analysis. The order of their births and the intervals of the birth of the children had significant effect on the attention given to children, and this had an adverse effect on the child care practices and nutritional status. In this study, about 62% of the children were between 2$^{nd}$ and 4$^{th}$ in birth order (that is 2$^{nd}$, 3$^{rd}$ or 4$^{th}$ children of their parents). A recent study carried out by Mertens, Benjamin-Chung, Colford, *et, al.*, (2020) reported that sex (gender), environment, number of births and birth orders affects the care practices of children and this adversely affects their nutritional status.

About 50% of the families in the three IDP camps had more than one child with over 23% of them having at least 5 children as most of these children were automatically inherited due to loss of their parents. This may therefore impart severely on the ability to provide the basic nutrition for the children, especially for those with low socioeconomic status, and unless the nutritional support at the camps are improved through interventions and healthier dieting, the children would likely suffer worse health conditions arising from malnutrition. All of these

factors can increase risk of under-nutrition and malnutrition and this can contribute to the development of chronic diseases such as high blood pressure, cardiovascular diseases, diabetes and high cholesterol later in life. Birth interval is the length of time between the birth of two children, the previous and the subsequent birth. Birth intervals is important for the child's health and nutrition outcome.

The longer the birth interval the better for the whole family because it is good for mother, children health, and nutritional outcomes. Short birth intervals can affect the child's health and put it at risk, and nutritional outcomes such as low birth weight, short birth intervals depletes mother's nutrient reserves, which leads to the increased risk of poor nutritional status and adversely affecting the children's nutrient stores at birth, **(IsratRayhan and Khan, 2006)**. Short birth intervals affects the mother's care for a new child, reducing the amount of time the mother devotes to care for the older children. The subsequent pregnancy may interfere with the care of the current child **(IsratRayhan and Khan, 2006)**.

The place of birth of infants affects their nutritional status due to poor knowledge, attitudes and practices of the mothers, mothers who delivers at home may not have been attending the antenatal clinics to listen to nutrition and health messages and would develop negative influence on the mother, infant and the young children nutrition outcomes as well as children health, **(Ngure, Reid, Humphrey, *et. al.*, 2014).** Lack of adequate infant and young child feeding (IYCF) knowledge and care practices directly affect the nutritional status of children and this affects child survival. Improving on feeding knowledge and care of children is therefore an important action towards improving child nutrition. In this study 65% were delivered at home. Child deliveries at the health facility help to improve the health and nutrition care practice will ensure that the children's health and nutrition care is attended to, this sets the stage for children to thrive and develop well, in this study, and about 35% were delivered at the health facilities.

Good nutrition knowledge can also be determined by the level of education, personality and the amount of money as income in the family has direct impact on the nutrition of the family. According to **Ernst, Schlattmann, Waldfahrer and Westhofen, (2021)**, the measure of the level of individual and family's economic and social status most of the time is based on the occupation, education and the income of the family, these are strong factors of how healthy the individual and family can **be. The study by Arthur, Nyide, Soura, Kahn, *et, al.*, (2015)** revealed that the level of education of occupation the caregivers is considered as a major reason for the poor food consumption of the children, thereby, exposing them to the risk of malnutrition. Most of the caregivers in this study are illiterate 61% which is capable of bringing negative effects on the feeding of the children. The High education level is always associated with better economic outcomes, as well as a better welfare of the family, **(Ernst, *et,al*, 2021)**. Income can be measured with the family source of livelihood, being able to withstand economic pressure and poverty thresholds, lack of income is always related to poor health and nutrition outcome, **(Mazzonna, 2014)**.

High income levels have been associated with provision of adequate health and nutrition for the family, **(Mazzonna, 2014)**; similarly, low levels of income bring about hardship, poor health and poor nutrition in the family. Individuals and families with high levels of education would most of the time have a good paying jobs, and good financial resources to improve the likelihood of adequate nutrition for the home and also enable the family access better health care, **(Mazzonna, 2014)**. In this study only 58.1% earn more than N50,000 monthly, which is very poor for the livelihood of the family.

Most belief system accepts that fatherhood is important, because a father's sensitivity early in a child's life can leads to fewer behavior issues of the children. **Boyce, Essex, Alkon, *et,al.*, (2006)**, in a study on the Early father involvement moderates Biobehavioral susceptibility to Mental Health problems in Children, states that children have fewer emotional, health and behavioral issues, if their fathers are present in the home, but due to the challenges faced in the IDP camps most families lost their fathers thereby having their mothers, grandparents, siblings and other relatives as household heads, a total of 30% of the respondents in this study do not have their fathers as their household heads, most were separated from their fathers and do not even know if their fathers are still alive which is a very pathetic situation. A father is an essential figure to homes,

the importance of a father can be seen physically, emotionally, mentally and spiritually in the family to support in improved welfare and nutrition, **(Boyce, *et,al.*,2006)**. The work of making a happy home does not only rest upon the mother, fathers have an important part to play.

An estimated number of 99% of the members in the camps have lived there for more than two years due to the challenges they faced in their homes. A study in Jos, Nigeria by **(Glew, Bhanji and VanderJagt, 2003)** on the Effects of displacementfrom ethnic and religious conflict on the growthand body composition of the Fulani children in northern Nigeria, observed that malnutrition cannot be avoided in emergencies without an adequate intervention or support services in place, it would help to alleviate the sufferings faced by the people, but inadequate nutrition interventions in IDP camps can lead to sufferings, malnutrition and growth failure among children. Undernourished children manifest with chronic and acute malnutrition, which exposes them to serious danger to their overall health and well-being. This study reflects the result of high burden and severity of malnutrition among children in the IDP camps due to their prolonged living in the camps without having their freedom. This indeed is so dehumanizing and frustrating.

The weight for age anthropometric characteristics (underweight) of the children as presented in Table 4.3a indicated that a good number of the children were under weight based on their weight-for-age Z-score, 57.2% males and 42.7% females which were studied to arrive at this data. According to **Bilukha, Jayasekaran, Burton, *et,al.*, (2014)**, on the study on Nutritional status of women and children refugees from Syria: the **Morbidity and Mortality Weekly Report (2014)**, reveals that the children in the Internally Displaced Person's Camps are at risk of malnutrition due to some limiting factors such as close birth intervals between the children, poor infant and young child feeding support, poor infants and young child care practices and inadequate coordination of humanitarian assistance. During the study, it was established that the amount of foodstuff supplied to the IDP Camps were small and grossly inadequate and not regular, leading to the undernourishment of the children. In the **Global Nutrition Report, (2021)**, there are some achievements in the standard of living in IDP Camps in some countries although the improvement was slow, especially in sub-Saharan Africa, the study estimated about 150 million (21.9%) children were stunted, 49.5 million (7.3%) wasted. This situation is even worse in Africa, where the prevalence of stunting is approximately 29%, which is higher than the global average of 21%, **(Global Nutrition Report, 2021)**. In comparison, with the study of **Gayawan, Adebayo and Waldmann, (2019)** on modeling the spatial variability in the spread and correlation of children malnutrition in Nigeria, about 7% of under-five children were wasted due to poor dieting and in refugee camps. In this study children that were under weighed for male were 5.3%, while 4.4% were under-weighed for female and 2.1% were severely under-weighed for males while 2.0% were severely under-weighed for female.

The weight for height anthropometry inadequated weight gain or growth failure. The leading cause of wasting in the children in this study was due to the food insecurity leading to the high burden of malnutrition. Wasting characteristics which is wasting is a reflection of acute malnutrition and it is suggestive of in this study was 2.9% severely wasted for male and 2.8% severely wasted for female. There was a report on the prevalence of58% underweight and 34.7% wasting in Sri Lanka relief camp in the Somalian IDP camps study by **(Kinyoki, Moloney, Uthman, *et,al.*, (2017). Olack, Burke, Cosmas, *et,al.*, (2011)** reported on 11.8% prevalence of wasting among the informal urban settlement of Kenya, the reports shows that malnutrition among children is very common in IDP Camps.

Other factors that contributed to the poor nutritional status among the children in this study included poor exclusive breastfeeding practices and short breastfeeding duration and this is in agreement with the earlier studies that documented poor Infant and Young Child Feeding (IYCF) practices in displaced households by **Zakanj, Armano, Grguric, *et,al.*, (2000)**, on the study on 'Influence of 1991-1995 war on breast-feeding in Croatia'. Poor IYCF practices can impair the child's body immunity and increase susceptibility to infections and illnesses. Clinical signs of malnutrition were noticed in this study population in the form of fluffy hair, oedema and discoloration of the hair which are suggestive of malnutrition, according to **Goldberg and Lenzy, (2010)**. The variation in the reports of malnutrition in the different studies reviewed could be due poor and inadequate feeding of the children. And the

level of humanitarian aids received from the government, agencies and organizations are not adequate, due to their prolonged stay in the camps other morbidity and mortality conditions persisted in the camps.

Height for age (stunting) in this study was 2.3% severely stunted for male and 1.9% severely stunted for female, while the national average is 37% **(NPC, 2019)** and that which was reported in Afghanistan due to war was 39.9%, there were more males than females stunted in this study. The stunting prevalence and the national percentage shows that the poor nutritional status of the children in this study was similar to the general nutrition situation in the under-five children in IDP Camps. Table 4.3a presents the standard deviation values for all the variables are less than their mean z-score which indicates that the observations are not widely dispersed.

The study showed the association between the anthropometric indices and the nutrition education, evidenced by the percentage occurrence before and after the nutrition education which showed 4.1%, 4.5% and 5.7% for severely underweight, stunting and wasting respectively before the nutrition education. About 2.5%, 4.3% and 2.8% for underweight, stunting and wasting respectively at 8 weeks after nutrition education**,** but the P-value do not show that they are underweight and severely undernourished.

Nutrition education provides the information on the nutritional value, quality of foods eaten and making the best food choices for adequate nutrition. It creates the awareness on nutrition problems and the willingness of the individual to make positive changes. In this study, before the nutrition education was given to the caregivers, a baseline initial anthropometric assessment was carried out which recorded 4.1% for severely underweight, 4.5% for severely stunted and 5.7% for severely wasted children, these records were attributed to poor dietary intake and undernutrition which deprived the children of fundamental nutrients in their body and rendered them more susceptible to malnutrition problems and not being able to meet the recommended standard dietary requirements.

According to **UNICEF, (2014)**, most malnourished children are due to lack of food and poor dietary practices. Nutrition education strategies was implored to include educational strategies on how to improve their nutrition outcome, environmental education on the access to health services, water, sanitation and hygiene practices (WASH), food and nutrition security and care, because, if these are not taken care of, can lead to the risk of malnutrition, and these strategies should be designed to facilitate the voluntary adoption of positive food choices, food and nutrition-related behaviors that can improve their care practices. A study by **Contento, (2008)** on "Nutrition education: Linking research, theory, and practice" states that Nutrition Education also include issues like food security, food literacy, and food sustainability. Food and nutrition interventions in the IDP camps should be aimed to improve the immediate food security and the nutritional problems of the people in the camps, by addressing the immediate and underlying causes of malnutrition.

After 8 weeks of the nutrition education, the children were visited for an anthropometric re-assessment and there was an improvement on their nutritional status with 2.5% severely underweight, 4.3% severely stunted (stunting cannot be corrected and some of the children were not see during the revisit) and 2.8% severely wasted, these are some of the benefits of good nutrition education, which is important to improve the quality of life. The Epidemiological studies shows that the changes in lifestyle, should be on improving the nutritional habits, diet, type of food eaten, the cooking time and cooking methods, to improve nutritional outcome, poor dietary intake patterns and under-nutrition to prevent the complications of malnutrition, **(Vardanjani, Reisi, Javadzade, *et,al.*, 2015)**.

Suggestions were given to the caregivers during the nutrition education on the following:

a. To ensure that they improve on the care practices of the children in order to prevent Moderate Acute Malnutrition (MAM)
b. To receive an appropriate treatment to prevent severe acute malnutrition (SAM) at the health facilities.
c. Ensure proper breastfeeding of infants and young children and encourage exclusive breastfeeding practices for 6 months in the subsequent pregnancies
d. Improve on the complementary feeding of the infants as from 6months of age
e. How to identify, manage and refer malnourished children to the health facility
f. Monitoring the nutrition situation in the camp.

g. Ensuring that they monitor the access to food within and outside the camp

Good nutrition positions the children for a healthy and successful life by raising their chances of survival and promoting cognitive development.

The result shows high values for all the variables which indicate high deviation from the mean of the sample except calcium and energy that shows zero dispersion, the p-values are greater than 0.05 for all the variables which indicates that the variables are insignificantly related in the before and after the nutrition education except calcium and energy that are significantly related with p-value less than 0.05. The study revealed the comparison between the WHO/FAO daily nutrient requirement and the quantity consumed by the children per 100gm of food in the last 24hours, this shows that 228.4g of carbohydrate is the daily requirement for the respondent, while 114g was consumed, 67.5g of protein is required while 56gm was consumed, 34.5g of fat/oil is required, while 28g was consumed, 350kj of energy required while 280kj was consumed and 5.0mg of zinc is required, while 3.7mg consumed. The daily nutrient intake of the children in the three IDP Camps was not adequate according to the result. A study on the Nutrient intake among Children aged 3-5years in Mateka, Western Kenya, stated that for children to achieve an improved growth and development standard their feeding should be rich in quality, quantity and the diet should meet most of their nutrient intake. Some of the nutritional requirements and benefits in the diet of the children include: Protein, Iron, Vitamin A and Zinc deficiencies are most prevalent, all these affects children globally and it is important to establish the intake of these nutrients in the diet of children to avoid deficiencies, **(Baeke, *et.al.*, 2010)**. Eating variety of food and in enough quantities daily, provide benefits to the nutritional status of children, **(Baeke, *et.al.*, 2010)**. Minerals are needed in small quantities to help in the transportation of nutrients, they are components of growth hormone, helps in the strengthening of bones, and for the normal transport of Haemoglobin (Hb). Fibre help to stimulate peristalsis, attracts water, increase bulk in food and prevents constipation,also present in fruits and vegetables **(Sun, Schutz, Maffeis and Obes Rev, 2004)**.

Most of the caregivers in the Camps were very busy with their menial jobs outside the camp and are not steady to attend to the feeding of the children and this have a negative effect on the nutrient intake and nutritional status of the children. The nutrient intake of the children did not meet up with the WHO/FAO standard, hence, the presence of malnourished children in the camps. But the good news is the improvement in the nutrient intake in the children's diet after the nutrition education. A re-assessment of the nutrient intake of the children was done (8) weeks after the initial assessment and it revealed that there was an improvement in their daily nutrient consumption. The table shows that 114g/124g of carbohydrate was consumed, 66g/67.5g of protein was consumed, while 28g/34g of fat/oil was consumed, 280kg/300kj of energy was consumed, 3.7mg/3.8mg of zinc before and after the nutrition education respectively.

The feeding practices of the children are grossly inadequate, and the implication is the high malnutrition rate recorded in the three IDP Camps. The major cause of most illnesses among the under-five aged children still remains Malnutrition and sometimes leads to deaths amongst children in the IDP Camp settings. Adequate Nutrition at this stage of the children's life is crucial for their growth and development; therefore, it is necessary to provide all the required food the children need. Globally and naturally, it is important to start the feeding of children with initiation of breastfeeding within one hour of delivery, then exclusive breastfeeding for 6months and breastfeeding continued for 2years, while adequate, rich complementary feeding starts at 6months of age, and breastfeeding given to the children on his/her demand**, UNICEF, (2019)**. In this study, most of the mothers did not follow the above rules, which may be the reasons for the level of malnutrition amongst the children. According to a study by, **Black, Allen, Bhutta, *et,al.*, (2008)** on Maternal and child under-nutrition, Global and Regional exposures and health consequences, it was observed that poor food consumption, accounts for over half of all children's deaths, affecting them directly or indirectly, causing about 300,000 deaths each year Globally. A total of 47 million under 5 year children were wasted, 14.3 million were seriously wasted and 144 million stunted, while 38.3 million were overweight or obese **(Unicef/WHO/The World Bank, 2020)**.

According to Chiabi, Lebela, Kobela, *et,al.*, (2012), about 6 in every 100 Cameroonian children under five were malnourished in 2012. Adequate food consumption in infancy and early childhood is required to ensure adequate growth, health, and development of children to attain their full potential, while poor nutrition increases their risk of illnesses, and this is responsible for one third of the estimated 9.5 million deaths which occurred in 2006 in children below 5 years of age (World Health Organization, 2008) and (Black, Allen, Bhutta, *et,al.*, 2008). In this study 5.2% of the children eat once daily while 15.0% eat twice daily, this is not adequate for the nutrient intake of the children. Poor food consumption for the children is always linked to long-term impairment in their health and growth. Poor food consumption in the first 2 years of life lead to stunting and stunted adults (Martin, Gunnell and Davey, 2005). To improve food consumption of children in the IDP camps, food interventions should be addressed also focusing on female empowerment and nutrition education programs, (Moursi, Arimond, Dewey, *et,al.*, 2008). According to Erinosho, Dixon, Young, *et,al.*, (2011) it is noted that healthy eating during early childhood is important for growth and development.

There are other factors that lead to the high burden of malnutrition in this study, these include the skipping of meals by the children, 38.2% regularly skip their meals due to the unavailability of food, 38.2% were restricted from eating some meals due to food shortage and ignorance by the caregivers, other are the poor dietary diversity, monotony of their diets and poor diet quality. The causal problems of malnutrition in the camps need to be addressed and good infrastructures should be put in place to help protect and promote an optimal growth and development of all children in the IDP camps. Also, caregivers of 3.1% of the children refused giving the children some certain foods like meat, eggs and banana because they felt the children are not matured enough to eat those foods, while 0.4% vomited most of the time, during the nutrition education, such caregivers were advised to access the health facilities with their children for de-worming.

The assessment of the 24 hour dietary recall showed the number of food groups consumed by the children, it revealed that only 10.4% ate meat and poultry, 13.4% ate eggs, while 11.1% ate fish and sea foods, these are inadequate for the nutritional requirements of the children. When the caregivers were interviewed it was observed that some of the foods were readily available in the locality and were not well utilized due to ignorance, the nutrition education created awareness to make them understand that those foods are good sources of food nutrients that will help prevent malnutrition in children if given to them regularly, but most of them do not possess the fund to purchase them. The USDA (MyPlate and Food Pyramid Resources, 2013), stated that about 2 to 3 servings of protein rich foods should be consumed daily, because proteins are essential for the repair of the body cells, and to provide energy in the absence of carbohydrates and is converted to fat when eaten in excess and this will improve the nutritional status of the children. Fish, Meat and poultry supply protein, iron and zinc to the body (Sun, Schutz, Maffeis and Obes, (2004), the same author also stated that protein is necessary for the growing child daily, because lack of protein in the diet of children slows their growth, lower their immunity and reduce muscle mass, and this can lead to retarded growth, poor wound healing and reduced energy, (Sun, et.al., 2004).

According to Baeke, Takiishi, Korf, *et,al.*, (2010), vegetable and fruit consumption is a good practice and should be encouraged, fruits and vegetables are vitamins and minerals rich foods necessary in the diet for good health, also essential to maintain healthy tissues, cell respiration, absorption of nutrients, promotion of growth and help boost immunity. It is suggested in food guide pyramid that 3 to 5 servings of vegetables be consumed each day and 2 to 4 servings of fruit taken daily, "USDA MyPlate and Food Pyramid Resources, (2013). Milk, milk products and eggs are good sources of protein and they provide vitamins and minerals to the body; which also suggests 2 to 3 servings each day. Cereals are an good sources of energy, and is good for the children, cereals are found at the base of the food guide pyramid and it is suggested that about 6 to 11 servings be consumed daily, (USDA MyPlate and Food Pyramid Resources, 2013). But in this study, the children in this study could not meet up with the recommended number of daily servings, and this really affected their nutritional status, and this evidenced by the level of stunting, underweight and wasting reported.

After the nutrition education their food group consumption was improved, it was observed that 10.4%/13.9% ate meat and poultry, 3.8%/6.9% ate eggs, and 11.1%/16.5% ate fish and sea foods, while 3.2%/10.5 ate milk and milk products respectively for before and after the nutrition education. These led to the decrease in the rate of malnutrition reported at the week's anthropometric re-assessment. The result reveals that the association between the food group consumption and the p-values for the variables under consideration and the nutrition education were significant.

The diet was not well diversified among the 1,420 children used in this study. Also to note that poor dietary diversity is a challenge in meals, especially among children. A recent case study by **Gregory, McCullough and Ramirez-Zea*et,al.*, (2008)**, in an urban area in Mali, revealed that cereal was well consumed, it was 100% while the other food group consumption were low including the animal protein, which led to a high rate of malnourished children in that study, though the condition were due to high daily consumption of rice based diet with reduced intake of other food groups. Also, a dietary intake assessment by **(Neves and Madruga, 2019)** on Complementary foods, the consumption of industrialized foods and nutritional status of children aged 3 years and below in Pelotas, Rio Grande do Sul, Brazil stated that the diversity of foods involving few food groups is poor, which led to the high rate of children malnutrition. Eating foods from different food groups help to provide adequate nutrition and is necessary for proper growth and development of children, it is also vital in the effort to address malnutrition. When the children do not get the necessary nutrients for their growth and development, it deteriorates their health, **(Neves and Madruga, 2019)**.

According to **Global Nutrition Report, (*2020),* p**oor child dietary practices are prevalent among children in Cameroon, only about 20% attained a minimum dietary diversity while only 43% attained the minimum meal frequency. The nutrition education improved the diversity of their diet; the following is the information on the dietary diversity score before and after nutrition education respectively. A percentage of 28.3%/18.9% children ate less than 4 food groups in the last 24hours, 35.9%/39.7% consumed between 4 to 5 food groups, while 35.8%/41.5% of the children consumed more than 5 food groups in the last 24hours.

The p-values and chi-square values of the food diversity of the children result reveals that the chi-square values and p-values for all the variables are less than 0.05 which indicates that the variables are significantly related in the period before and after the nutrition education. The study shows that the dietary diversity of <4 (Low) was insignificant (p-value = 1>0.05; $X^2$ = 0.000), the dietary diversity of 4-5 (Medium) was insignificant (p-value = 1>0.05; $X^2$ = 4.086) and the dietary diversity of 5< (High) was insignificant (p-value = 1>0.05; $X^2$ = 4.086).

The care practices of the children were observed, before the initial assessment it was observed that most of the caregivers do not show much concern to the care of the children, the caregivers go out for their daily menial jobs outside the camps, thereby neglecting the children at home. In this study, a total of 8% were exclusively breastfed and 92% were not exclusively breastfed. This has led to inadequate care practices and malnutrition of the children. In a study on "Exclusive breastfeeding in the first six months of a child's life and its associated factors among children aged 6-24 months in Burao district, Somaliland" it is revealed that globally it is about 40% of infants are exclusively breastfed expecting that it rises to 50% by 2025, (Cai, Wardlaw and Brown (2012). Although in the past two decades the rates of Exclusive Breastfeeding have been increasing, for 100% global target coverage to be achieved a lot need to be done in awareness creation as recommended by UNICEF, especially in the IDP Camps **(Mensah, Acheampong, Anokye, *et,al.*, 2017)**. Despite the World Health Organization recommendations and benefits only 39% of newborns are being initiated to breastfeeding within one hour of delivery, worldwide, and 37% of infants exclusively breastfed, **Reddy and Abuka, (2014)**.

From 6 months of age, an infant needs more energy and nutrients, these are provided by the breast milk and complementary foods, it is advised that these foods for children should be adequate to meet those needs. This transition to complementary feeding is important in the life of children, there is poor timing in the complementary feeding practices thereby introducing it too early or too late (that is introducing it before 6mths or still continuing on

exclusive breastfeeding after six months). Irregular feeding and poor feeding methods, poor hygiene practices, poor nutrient quality of the complementary foods given to the children, there is also too little dietary variety; inappropriate consistency, (that is, the food is too thin or too thick), all these can lead to children malnutrition, **(Ng, Dibley and Agho, 2012)**. Complementary feeding should start at 6 months and not before or after 6 months; it should be adequate in amounts, consistency and frequency and in the diversity of their feeding, prepared in a safe and hygienic manner **(Monte and Giugliani, (2004)**. In this study about 85% of the caregivers started giving the children complementary foods before the age of 6months and 15% started from 6months, which is not appropriate for the infant, during this period poor nutrition in children has immediate consequences of increased morbidity, mortality and there is delay in the development of the brain and the nervous systems **(Krebs, Hambidge, Mazariegos, *et,al.*, 2011)**.

Most of the children were not de-wormed, only few of the children were de-wormed in the past 6 months (about 16%), while 84% children were not de-wormed, in the preceding 6months. The World Health Organization recommends de-worming interventions for children which is aimed at improving the health and nutritional status of children through the periodic (six monthly) administration of a tablet (200mg dose) of albendazole or mebendazole and complete course of immunization, **(WHO, 2006)**, these interventions are highly effective, inexpensive and easy to implement. However, many children in the IDP camps do not have easy access to these interventions, **(Victora, Christian, Vidaletti, *et,al.*, 2021)**. About 40% did not complete their immunization schedule. But there was an improvement in the de-worming and immunization records after the nutrition education.

After the nutrition education, the caregivers attitude towards exclusive breastfeeding improved from 8% to 15% on the subsequent births and children, 57% caregivers took their children to the health facilities for de-worming, 32% caregivers had taken their children for the complete course of immunization. The association between the nutrition education and responses in respect to whether children have ever been breastfed, and the age when water and complementary feeding were introduced and whether immunization card was seen, exhibit an insignificant relationship as their p-values were consistently above 0.05 while responses in respect to whether children were exclusively breastfed and if children were de-wormed in the past 6 months and immunization status was based on if the immunization card were sited associated significantly.

Causal and other risk factors to malnutrition in the IDP Camps included poor sanitation and hygiene, poor sources of drinking water which can lead to infections, attacks by mosquitoes which can lead to persistent episodes of malaria, worm infestations due to poor environmental conditions, injuries, diarrheal conditions, ill health affecting the immunity, open defecation attracting bad odour, flies and rodents to the environment causing ill health and poor nutritional status of the children and deaths, about 88.4% of the respondents had poor sanitation and hygiene situation, 22.4% used water from the well where every dirty containers are used to fetch water from and 89.6% use water from the borehole. A study by the Ethiopian Public Health Institute **(EPHI) and ICF, (2019)** on Children Malnutrition and the Association with Diarrhea, Water supply, Sanitation and Hygiene Practices in Kersa and Omo Nada Districts of Jimma Zone, Ethiopia, and the results from the Ethiopia mini District Health Survey (DHS) revealed that the prevalence of wasting, stunting, and underweight were 37%, 7%, and 21%, respectively and as a result of the above factors. There was poor sanitation, water supply, and hygiene (WASH) interventions in the camps and this can cause a good environment for the development of infectious diseases linked to malnutrition, **(UNICEF 2015)**. The poor environmental conditions can affect the children's nutritional status through diarrheal diseases, worm infestation, and other environmental infections, **(Ziegelbauer, Speich, Mäusezahl, *et,al.*, 2012)**.

Access to healthcare requires patients gaining access into the health-care system and receiving the required healthcare services, and finding healthcare worker that can meet their health needs and whom they can trust **(AHRQ, 2010)**. In this study 35.5% had poor medical accessibility which affected their health outcome, while 12.3%, 61.3% and 14.7% had challenges with adequacy of clinic, school and toilet

infrastructure in the IDP camps respectively. Limited or poor access to education, healthcare services, health infrastructures and poor hygienic environment adversely affects the nutritional status of children, **(Clark, Coll-Seck and Banerjee, 2020)**. The burden of malnutrition in this study is as a result of inadequate poor infrastructure, humanitarian assistance, or health interventions from the Local, State and Federal Government or International humanitarian agencies in the sampled IDP camps. Because of this, it is reported that NEMA has positioned emergency food and non-food items in their warehouses situated in Adamawa, Borno, Gombe and Yobe states for distribution to the IDP Camps and their host communities, **(Muhammad, 2016)**. The Federal Government of Nigeria has also put in place some measures for reducing the effects of the burden of the Internally Displaced Persons. These include the Safe School Initiatives (SSI), the Presidential Initiative for the North-East (PINE) and the Victim Support Fund (VSF) amongst others, **(Muhammad, 2016)**.

The adequacy of the nutrition intervention strategies in the IDP Camps should include nutrition intervention support from the government, agencies and organizations, availability of food in the camps, utilization of the interventions and other assistance received. In this study the nutrition interventions received by the caregivers are not adequate, 94.2% are not satisfied with the interventions received, and the groups most affected with the inadequate availability of food are the children. Appropriate legal frameworks for the IDPs and a specific institutional agency should be put in place to attend to the IDP's welfare, the roles and responsibilities of the authorities concerned should be well spelt out, this gap restrict the humanitarian efforts in their management approach, **(Shedrack and Nuarrual, 2016)**. UNICEF, through its integrated management of acute malnutrition (IMAM) programs in 57 local government areas and 399 sites in Borno, Adamawa and Yobe states, reached and managed only a total of 153,936 children with severe acute malnutrition **(ICiR, 2017)**. Also a total of 137,962 children aged 6 to 23 months were given life-saving micronutrient powder in the three states **(ICiR, 2017)**.

In the **UNHCR 2020** midyear report; a total of 5.4 million persons were in need of support, only 2.5 million were targeted for the response, and 31% have been reached so far in Borno, Adamawa and Yobe states, **(UNHCR 2020)**. When the people in the IDP Camps were interviewed, about 76% of the Internally Displaced Persons cited food as their unmet need.

Agricultural inputs such as fertilizers, chemicals and seeds etc. should also be distributed in order to improve agricultural activities around the camps.

- Provision of medical supplies should be considered in order to ensure the delivery of a robust and sound healthcare system. This will go a long way in averting disease outbreak and health emergencies at the IDP Camps
- Efforts should be outlined and implemented toward rescuing the dwindling educational sector, thereby absorbing the school drop outs from the streets
- International donor agencies, including the International Red Cross Society (IRCS) and others should intervene in the awful situation of the IDPs, especially in providing them with adequate shelter so as to reduce the population in their overcrowded settlements.
- There should be transparency and openness in the distribution of relief materials to the vulnerable persons in the affected communities.

**Limitations experienced in the study**

- Most of the caregivers cannot give the true age history of their children, their stage of entry into the camps and length of stay in the camp, this could affect the result.
- Most respondents would refuse to release their food samples for analysis
- Most caregivers do not have enough food to release for analysis
- It was not easy preserving the food samples from the study area to Awka, where it was analyzed
- There could be potential biases, from measurement error which could have occurred during anthropometric assessment for uncompromising children
- Some of the caregivers were not steady during the procedure, some go out for their menial jobs outside the camp and we have

to wait for their return, the movement tends to cause some distractions in the process
- There were security risks in the Bakasi camp in Borno and the New Kuchingoro camp in Abuja which limited our movements round the camps
- There was some restrictions in taking pictures in Bakasi camp Borno and the New Kuchingoro camp in Abuja
- There are challenges in mapping out the households for easy collection of data, some households are joined together, not easy to differentiate the mappings
- It was difficult to convince some caregivers about the study
- There was serious Financial constraints on the researcher
- Incomplete information of the 24hour dietary recall leading to potential bias, some caregivers could not give details of food eaten in the past 24hours

**Findings**
- The camps represented in this study was not be the true representation of all the IDP camps in the country
- The food samples collected from the individual caregivers from the different IDP Camps may not be a true representation for all IDP Camps in the country.

**Strengths of this study**
- The main strength of the study was the large sample size in all the camps, enough children to meet up with the study
- The incentives (Sachet Milo and Milk) provided, helped to bring together the children and their caregivers for us to gain their attention
- The guidance from my dependable and reliable supervisors who were keeping in touch with the researcher even while in the field.

**Recommendations**
- Measures should be taken towards addressing the malnutrition issues in the IDP Camps by the Government and International Organizations.
- Policies should be put in place which should be aimed at provision of adequate food, and improved diets for children in the IDP camps by the Government.
- Relevant stakeholders such as government, agencies, international, non-governmental organizations, United Nation agencies, and local partners should be involved in the support for nutritional interventions for children as children constitute the highest population and are most affected with malnutrition in the IDP Camps.

**Suggestions for Further Studies**
- There should be further studies on the effects of Nutrition education on the nutritional status and care practices of children in other internally displaced persons camps in Nigeria
- Similar studies should be conducted on other age groups in other states and other IDP camps in the country so as to bring about lasting solutions to the problem of the IDPs.

**Contribution to knowledge**
- This study revealed the burden and severity of malnutrition in children in IDP Camps
- This study also reveals that the under-five children are the most vulnerable group in internally displaced persons camps
- The study contributed to the existing body of knowledge in area of the key determinants of malnutrition among under-five children in IDP camps.
- It also explained the importance of Nutrition Education on the food intake and care practices of the children
- Nutrition education in IDP camps can positively impact children's nutritional status and care practices by providing caregivers with knowledge about balanced diets, hygiene, and appropriate feeding practices, there's potential to improve children's overall health.
- Intervention Strategies- It would identify the interventions that can be implemented in IDP camps to improve children's nutritional status and care practices.
- This knowledge can inform future programs and policies.

- Provided valuable insights into the effectiveness of educational initiatives within the unique context of IDP camps.
- It explored the factors that contribute to or hinder the success of nutrition education programs in these challenging environments, considering socio-economic, cultural, and logistical aspects.
- It investigated the long-term effects of nutrition education, not only on immediate nutritional outcomes but also on the overall health and well-being of children.
- Provided evidence-based recommendations for policymakers to enhance nutrition education policies and practices in IDP settings, contributing to the development of more effective and targeted interventions.

## Conclusion

There are high death rate of *children* living in *Internally Displaced Persons camps* in *Nigeria, this issue* have been attributed to poor *nutritional status which had led to high prevalence of stunting, wasting and underweight amongst the children. The poor nutritional status of the children was also attributed to the fact that most of the children skip meals due to unavailability of food present in the camps.*

Malnutrition remains a major health problem among under-five children in internally displaced persons camps, in this study the prevalence of underweight, stunting and wasting was at 2.1% severely underweight for males and 2.0% severely underweight for female, 2.3% severely stunted for male and 2.1% severely stunted for female while 2.9% severely wasted for male, and 2.8% severely wasted for female. The children in the camps experienced lack of good foods, poor nutrient consumption, thereby exposing them to malnutrition, diseases and even deaths. Caregivers of the children are also vulnerable in the camps. Studies have shown that children (male and female) suffer most in a period of conflict and displacement (NAN, 2016).

It was also identified that there is elevated health problems among the children in the camps as well as in children. This indicates the need to consider the challenges on the health of people who have been internally displaced. Intervention studies are needed to shed light on approaches to improve the health of internally displaced children.

The nutrition education intervention implemented in this study was able to improve the knowledge of the caregivers such that they were able to make informed food choices in their eating habits after the intervention. It was observed that the level of awareness of the caregivers significantly affected their eating habits and the nutrition education helped the respondents to adopt positive behavior towards food-related interventions that will improve the overall health and well-being of the children, like cooking with more vegetables, boiling their drinking water, regular hand washing to prevent infections, feeding the children more often, improved awareness on purchasing more food items with their monetary gifts.

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