

# Nutrition status of pregnant women in selected internally displaced persons camp in Delta state, Nigeria

## Abstract

**Introduction:** The recent flood situation in Nigeria has contributed to the upsurge in the percentage of Internally Displaced Persons particularly in the Delta State. Children and pregnant women are more vulnerable. Poor Nutritional status internally displaced person is a major occurrence. This has a serious implication for pregnant women in Nigeria. Assessing nutritional status of pregnant women will help in prioritizing need and intervention problems for internally displaced person, therefore this study will assess a Nutritional status of pregnant women in Selected internally displaced persons camps in Delta state

**Methods:** A cross sectional study was conducted among pregnant women in four selected internally displaced person camps in Delta State, November 2019. A total of 99 pregnant women were randomly selected from each camp. A structured questionnaire was used to collect socio-demographic data from respondents, Body mass index and mid upper arm circumference with assessed result were compared with standard criteria for nutritional status. Data was clean and entered into SPSS Version 22. Descriptive statistics was used and inferential statistic, chi square and logistic regression was use for predicting variables after adjusting for confounders.

**Result:** The mean body mass index of respondent was 23.5 ( $\pm 3.9$ ) which indicate a good nutritional health status, however 9.3% had poor nutritional status with BMI ( $>18.5$ ). Also the mean distribution of MUAC was 27.5( $\pm 3.6$ ) cm indicating good nutritional status of ( $<23$ cm), although 27.8% had poor nutritional status with (MUAC  $\geq 23$ cm). chi square test, economic status ( $X^2=9.794$ ,  $P=0.020<0.05$ ), antenatal visit of at least twice in present ( $X^2=5.946$ ,  $P=0.015$ ) and pregnancy and present trimester ( $X^2=12.939$ ,  $P=0.002<0.05$ ) were significantly associated with nutritional status of pregnant women. On regression analysis only ANC visit (OR= 3.134, CI=1.226-8.013, p-value=0.17) and present trimester of pregnant women (OR=0.75, CI=0.016-0.352, p-value=0.01) were significant

**Conclusion and recommendation:** Poor nutritional status among pregnant women in this study is high, there is need to develop programs that focuses on educating mothers on the need of good nutrition in Nigeria.

**Keywords:** nutritional status, pregnant women, internally displacement

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**Abbreviations:** BMI, body mass index; MUAC, mid upper arm circumference; USAID, United state agency for international development; NGOs, non-governmental organizations; IDPs, internally displaced persons

## Introduction

Malnutrition is a multifaceted problem disturbing the world globally, low and middle income countries are faced with severe malnutrition and this result in morbidity and mortality worldwide.<sup>1</sup> Malnutrition represents a situation of nutritional imbalance consisting of under nutrition intake of food deficient in macronutrients (calories and protein) and sometimes micronutrients (multivitamins and minerals) and over nutrition intake of nutrient poor diet in spite of excess calorie.<sup>2</sup> This has a serious consequence for pregnant women due to the nutritional need of pregnant women.<sup>3</sup> Malnutrition is a major occurrence among displaced person.<sup>4</sup> Conflict and disaster such as flood forces people to move from their locality to avoid its effect, this movement is characterize as internal displaced of people when the person remains within their nationality.<sup>5</sup> This account for about 40million people globally, however 75% of this population

affected are living in developing countries like Nigeria.<sup>6</sup> The loss of livelihoods, together with the disruption of social and cultural norms, has a negative impact on the availability of and access to utilization of food together with increases risk for infectious diseases such as malaria, HIV/AIDS etc.<sup>4</sup> This has resulted in fueling poor nutritional status among internally displaced persons<sup>7</sup> despite intervention by humanitarian organization.<sup>8</sup> Studies have shown that women and children constitute about 80% internally displaced populations affected with nutritional problem.<sup>9</sup>

Maternal nutrition before and during pregnancy is an important determinant of pregnancy outcome and fetal growth.<sup>3</sup> From evidence nutritional status of a woman before and during pregnancy is found to be necessary and critical as it determines and allows for a healthy pregnancy outcome and the first 2 years of a child life, thereby preventing adverse pregnancy outcome such as stunting and subsequent obesity and non-communicable diseases in adulthood.<sup>10</sup> Despite this important the rate of malnutrition among pregnant women in Nigeria is still high with about 22.7% prevalence rate<sup>10</sup> even with several policies and intervention made to tackle malnutrition.<sup>11</sup>

However, the rate of internally displacement of people in Nigeria

is increasing due Boko Haram insurgency, environmental hazards such as floods, drought and oil pollution; and improper town planning in Nigeria causes thousands of new cases of displacement yearly (IDMC 2019). In Delta State, the rate of internally displaced person doubled it number within 2018 and 2019, causing about 18000 people to move to temporary internally displaced person camp.<sup>12</sup> The rate of poor nutritional status among pregnant women in internally displaced person camp is alarming.<sup>13</sup> This has a consequence for both the mother and the unborn child,<sup>14</sup> studies have shown that Babies born by displaced mothers have a high risk of perinatal mortality, lower birth weights, and small for gestation age at births and suffer more complications (IMDC 2018). Nutritional status is considered as an important indicator in estimating the well being of population affected with crisis and emergency.<sup>15</sup> This helps with strategies planning through identify and prioritization of needs and use of resources, tract and prevent malnutrition among these population.<sup>15</sup> Malnutrition which may manifest as either anemia or under nutrition are common experience among pregnant women in internally displaced setting.<sup>16</sup> Weight gain in pregnancy is an important determinant of fetal birth weight and birth outcome.<sup>17</sup> Restriction in weight gain indicates nutritional deficit which may be severe and long.<sup>18</sup> Internally displacement restricts maternal weight gain which is an indication of poor nutritional status.<sup>19</sup> This is as a result of interruption of livelihood due to conflict and disaster of internally displaced persons which causes abrupt concern of food insecurity.<sup>19</sup>

A widely used method for assessment of weight gain in pregnancy is body mass index (BMI), However, A review of literature between 1995 and 2012 by Médecins sans Frontières confirmed that MUAC is a more acceptable way for diagnosing acute malnutrition in pregnancy because its change is insensitive or has little change with the effect of pregnancy.<sup>20</sup> Also, MUAC easy to measure and may not require the knowledge of gestational age. In humanitarian setting Mid-upper-arm circumference (MUAC) is more suitable because of its simplicity and may not require knowledge of gestational age or pre-pregnancy weight for diagnosis to be made.<sup>20</sup> MUAC has been successful used in several studies for assessment of nutritional status of pregnant women.<sup>8</sup> Although criteria for assessing malnutrition or maternal risk for having low birth weight differs from countries to countries.<sup>8,19</sup> Assessment of nutritional status among pregnant women in internally displaced camps has not yet been thoroughly investigated in our setting. Also criteria for cut off point for malnutrition using MAUC is still limited in our setting. According to Médecins sans Frontières review in national nutrition protocols, pregnant women, MUAC cutoffs for severe acute (SAM) varied from < 210 mm to < 230 mm depending on the region. In Africa and Asia, a cutoff point of < 230 mm is recommended for malnutrition in pregnant women at risk of delivering low birth-weight babies.<sup>20</sup> In providing background information of pregnant women in internally displaced setting, this study aimed at the Nutritional status of pregnant women in selected internally displaced person camp in Delta State with the use of Body mass index and mid upper arm circumference.

## Methodology

### Study setting

This study was conducted in four selected internally displaced person's camps located within Delta State. Delta state which is an oil producing state located in the southern region of Nigeria, with a landmass of about 18,050 km<sup>2</sup>. More than 60% of the landmass is land and a population size of 4,112,445 people (males 2,069,306; and

females 2,043,136 with 445,467 women of reproductive age)<sup>21</sup>.<sup>8</sup> The state is generally low-lying without notable hills and has the utmost communities for at risk for flooding.<sup>21</sup> In 2019, about 11 temporary internally displaced person's camps established which housed about 20,000 flood victims.<sup>19</sup> The study was conducted in the antenatal clinic of each selected camps

### Study participant, design, sampling

A cross sectional study was conducted among pregnant women in selected internally displaced camps in Delta State within the month of November 2019. Study Population and Sampling: This study involves 97 pregnant women living in four selected internally displaced camps in Delta State. All pregnant women living in the selected IDP camps at different stages of pregnancy and were willing to participate were included for the study, however, pregnant women who have not stayed at least one month duration in the selected camps were excluded from the study. Head count of pregnant women living in the selected camps was done on a week prior to the day of data collection which yields a total of 210. Sample size formula for one proportion was used estimated the actual sample size used for this study.

$$N = \frac{(Z^2 P(1 - P))}{E^2}$$

This was based on the assumption that P is the proportion (0.69%) of poor nutritional status among internally displaced pregnant women in a host community in Northern Nigeria.<sup>22</sup> Z is the confidence interval at 95% (standard value of 1.96) and E is the margin of error at 5%. This yields a minimum sample size of 99. A random selection of four internally displaced person camp from the 11 internally displaced person camps. Proportionate sample to size were estimated from each selected camp, after which a simple sampling method was used to select 99 pregnant women which was used for this study.

### Study variables

#### Data collection process

Data was collected from pregnant women in the selected IDP camps on each antenatal clinic day from 25<sup>th</sup> November 2019 to 30<sup>th</sup> November 2019. A validated structured questionnaire was used to collect data on social-demographic characteristics from respondents. Body Mass Index (BMI) and mid-upper arm circumference (MUAC) was done to assess nutritional status of the pregnant women. A digital weighting scale (Salter Weight-Tronix Ltd., West Bromwich, United Kingdom) was used to measure the weight of the pregnant women and stadiometer was use to estimate the height which was used to derived the body mass index (kg/ m<sup>2</sup>) pregnant women. Mid-upper arm circumference was measured with the use of non-stretchable measuring tape on left upper arm each pregnant woman. To minimize error, the measurements were done with the women wearing light clothing and no shoes. Each measurement was taken and recorded by the same measurer to eliminate inter-examiner error.

#### Statistical analysis

Data were analyzed using the statistical package for social sciences (SPSS package) version 17.0.<sup>23</sup> Descriptive statistic in the form of frequency table, mean, standard deviation and simple percentage were used to summarize variables. Maternal BMI were categorized into (BMI < 18.5 kg/m<sup>2</sup>), normal weight (BM 18.5–22.9 kg/m<sup>2</sup>) and overweight (BMI ≥23 kg/m<sup>2</sup>). And MUAC were regrouped as poor nutritional status >23cm and good Nutritional status ≤23cm.

Inferential statistic, chi square was used to test for association and logistic regression was used for predicting variables after adjusting for confounders. At 0.05 level of significant.

## Result

### Maternal nutritional status

Distribution of study participant base on the anthropometric data shows that overall, more 61.9% of respondents were had a normal weight and 9.3% were underweight, while 6.2% of the respondent were obese, the overall mean of BMI was 23.5 ( $\pm 3.9$ ). Also observation from this study shows that 27.8% of the participant had poor nutritional status with an indication of the mid upper arm circumference ( $\geq 23$ cm) with an overall mean 21.2(1.9) of while 70.2% had a good nutritional status with a mean distribution of 27.5( $\pm 3.6$ )cm as shown Table 1.

**Table 1** Assessment of nutritional status

Variables	Frequency (%)	MEAN ( $\pm$ SD)	Overall mean( $\pm$ SD)
BMI			23.5 ( $\pm 3.9$ )
normal weight	61(62.9)	22.2 (1.7)	
Underweight	9 (9.3)	17.5(1.0)	
Overweight	21(21.6)	27(1.3)	
Obese	6(6.2)	32.7(2.2)	
MUAC			25.8( $\pm 4.3$ )
$\geq 23$ cm	27(27.8)	21.2(1.9)	
<23cm	70(70.2)	27.5(3.6)	

### Prediction of nutritional status

Chi square and The chi square test shows economic status ( $X^2=9.794$ ,  $P=0.020<0.05$ ), antenatal visit of at least twice in present ( $X^2=5.946$ ,  $P=0.015$ ) and pregnancy and present trimester ( $X^2=12.939$ ,  $P=0.002<0.05$ ) were significantly associated with nutritional status of pregnant women. as shown in Table 2. However, after adjustment of possible confounders from the regression analysis model in Table 3, pregnant women who have attended antenatal clinic at least twice were more likely to have a good nutritional health status than pregnant women who have not attended ANC or have only one visit (OR= 3.134, CI=1.226-8.013, p-value=0.17), Also the present trimester of pregnant women was significant Pregnant women in their second (2<sup>nd</sup>) trimester were 0.75 times more likely to have a good health status with than pregnant women in their first trimester (OR=0.75,CI=0.016-0.352, p-value=0.01) as shown in Table 3.

## Discussion

This study focuses on the health status of pregnant women in internally displaced person camp in Delta state Nigeria. Result of this study shows that based on the body mass index score, about 9.1% of respondent were underweight, however, the average weight of all internally displaced pregnant women 25.8( $\pm 4.3$ ), Hitherto, weight gain is expected during pregnancy, this may be related to the good body mass index of the pregnant women in this study. Although a study in Algeria shows a higher body mass index value (29.14 $\pm 4.99$ ) among pregnancy.<sup>24</sup> Despite the important of good maternal nutrition and intervention of State Emergency response agency and Red cross

committee and other NGOs, in this study, result shows that about a quarter of pregnant women were found to have a poor health nutritional health status with a criterion of MUAC <23cm. This result is similar to the result of a study conducted in Ethiopia among pregnant women in humanitarian setting which shows that about a quarter of pregnant and lactation women had malnutrition, however their criterion for assessing differs from that of this study (MUAC >21cm).<sup>8</sup> Malnutrition is a common event in internally displaced setting due to loss of livelihood, increase poverty level and food insecurity, limited health services together with risk infectious diseases.<sup>4</sup> This may be responsible for the similarities of result in both studies, however, the effect of poor nutrition may continue among displaced persons even after the displacement.<sup>8</sup> However, this result is lower than the result from a study from an IDP camp in Northern Nigeria which shows that about 15.9% were malnutrition with the use of MUAC.<sup>25</sup> The difference may be due may be to the effect of non pregnant women which were inclusive in USAID study.<sup>25</sup>

**Table 2** Chi square analysis of association between nutritional status of pregnant women and maternal socio-demographic data

Variables	Nutritional status of pregnant women			
	Good 70=(%)	Poor N=27(%)	X2	P-value
Age (years)				
15-19	1(20)	4(80)		
20-24	13(81.3)	3(18.8)		
25-39	17(73.9)	6(26.1)	8.477	0.076
30-34	25(69.4)	11(30.6)		
$\leq 35$	14(82.4)	3(17.6)		
Educational level				
No formal education	6(60)	4(40.0)	0.256	0.96
Primary school	37(82.2)	8(29.6)		
Secondary school	24(61.5)	15(38.5)		
Tertiary	3(100)	0(0.0)		
Monthly income(Naria)				
$\geq 20,000$	46(79.3)	12(20.7)		
20000->40,000	12(50)	12(50)	9.794	0.020*
$\geq 40000$	12(80)	3(20.0)		
Trimester				
1st	7(43.8)	9(56.3)		
2nd	32(68.1)	15(31.9)	12.939	0.002*
3rd	31(91.2)	3(8.8)		
Gravid				
Primigravida	6(60)	4(40.0)		
Multigravida	32(76.2)	10(23.8)	1.1	0.577
Grandmultigravida	32(71.1)	13(28.9)		
Attended at least 2 ANC				
Yes	54(79.4)	14(20.6)	5.946	0.015*
No	16(55.2)	13(44.8)		

**Table 3** Logistic regression model of nutritional status of pregnant women

Variable	OR	95% confident interval		p-value
		Lower	Upper	
Monthly income				
Less than 20,000	Ref			
20000->40,000	1.394	0.377	5.161	0.619
≤40000	0.333	0.083	0.083	0.12
Trimester				
1st	Ref			
2nd	0.75	0.016	0.352	0.01*
3rd	0.206	0.2	0.54	0.206
Attended at least 2 ANC				
Yes	ref			
No	3.134	1.226	8.013	0.17*

Also monthly income, antenatal visit and present trimester were associated to the health status of pregnant women in this study, as well known, economic status of pregnant women has an influence on her nutritional status as it's determined the choices of food and availability and access to antenatal health care.<sup>26</sup> However after adjusting for confounders, economic status of respondent was not a significant predictor of nutritional status of pregnant women in internally displaced persons camp. This was due to the effect of displacement most of the women has lost their means of livelihood.<sup>27</sup> Also, attending antenatal care service was also an important predictor of nutritional health status of pregnant women in this study. As recommended by WHO nutritional education is an important aspect of antenatal care. This may has contributed to its significant in this study.<sup>28</sup>

## Conclusion

This study shows that there is high rate of poor nutritional status among pregnant women living in internally displaced persons camp. However attending antenatal care was a major factor to reduce the risk. Therefore government should develop a more comprehensive antenatal health care service in internally displaced setting. Also food programs which target pregnant women should be developed to reduce maternal and child morbidity and mortality.

## Ethical approval/consent

Ethical approval to conduct this study was obtained from the research and ethical review committee, Delta State Ministry of Health research and Ethical committee. Participants were made to sign a written informed consent after a detailed explanation of the objective of the study and procedure. However, participation for the study was completely voluntary, participants were informed about their right to withdraw from the study at any time without any penalty. Respondent's privacy and confidentiality were maintained.

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## Conflicts of interest

Author declares that there is no conflict of interest.

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None.

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