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Evaluation of Nutritional Status of Under-5 Children in Borno and Kano States of Nigeria

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Abstract
This study examined nutritional status of under-5 children in Borno and Kano States. Data were sought and obtained through Anthropometric parameters. A total number of 4,680 children were assessed in 4301 households in the two states. Out of this number 49.9% were males while 50.1% were females. The data analyzed showed that Severe Acute Malnutrition outshot 5% alarming international standard rate; prevalence ranged from 9.6% in Maiduguri Municipal Council of Borno State to the highest value of 12.2% in Bichi LGA, of Kano State. Female has the prevalence rate of 15.3% in Biu LGA of Borno state, while male has the highest value of 18.6% in Bichi LGA of Kano. The study also observed unabated terrorism, acute insurgent activities of Boko Haram which was the main challenge affecting food scarcity, others are ignorance, and socio-cultural influences that enhanced malnutrition of all the strata of population with concomitant effects on children. The study concluded that there was urgent need for a trajectory synergy among various strata of the society to demystify and deradicalization extreme religious ideology, urgent intervention on establishment and of implementation of community therapeutic care for integrated management of severe acute malnutrition in these states and perhaps in the entire region.

Keywords: Under-5 children, Nutritional status, Insurgency, Mid-upper arm circumference

Introduction

Contemporary interventions and reports from Goon et al (2011); United Nations (2015); and World Health Organization (2018) have revealed the global trends from 1990-2017 of millions of under-five children stunted at 253.4-150.8, wasted at 50.5, severely wasted at 16.4 and overweight ranged from 32 – 38.3. In selected countries from Africa for instance the Republic of Niger has 47% same age-cohort stunted, 36% underweight, 12% wasted and 27% of infants are born with a low birth weight, while South Africa has 27% stunted, 12% underweight, 5% wasted 15% of infant are born with a low birth weight. Nigeria has over 576 maternal deaths for every 100,000 live births

contribute to 14% of all maternal deaths globally. Likewise, the 128 child deaths per 1,000 live births accounts for 13% of all Under-five deaths globally while the neonatal deaths contribute to 32% of all under five deaths in Nigeria (International Food Policy Research Institute, 2015; and El-Rufai, 2017). These depicts the huge country disparities in maternal figures in Nigeria.

The projected estimation of malnutrition situations in Nigeria is unacceptably high especially with under-5 children; the Federal Office of Statistics (1999), National Bureau of Statistics (2012) and National Population Commission (2013) made comparative analysis which shows that one in every five Nigerian children dies before attaining the age of five; that on the average, a baby born in Nigeria is about 30 times more at risk of death before the age of five than a baby born in the industrialized countries. This implies that by global acute malnutrition (GAM) standard four out of every 10 Nigerian children are stunted or have low height-for-age refers to shortness that is a deficit of liner growth that has failed to reach genetic potential as a result of poor diet and disease. Also, one out of every four Nigerian children is also described as underweight; their weight is too low for their age while nine percent of the children are wasted. WHO (2000; 2004) and UNICEF, *et al* (2013) describe this state as severe process of weight loss often associated with acute starvation or severe disease, and a prevalence exceeding five percent is considered alarming.

According to WHO and UNICEF (2000); United Nations (2015) and El-Rufai (2017) malnutrition is a condition that develops when the body does not get the proper amount of protein, energy (calories), vitamins, and other nutrients it needs to maintain healthy tissues and organ functions, that is poor eating habits or lack of available food may lead to malnutrition. However, malnutrition occurs in children who are either undernourished or over nourished (ENN, 2005; UNHCR, 2013; and Tull, 2015). Children who are over nourished may become overweight or obese, which may lead to long-term health problems and social stress. But, the case of under-nutrition is a consequence of consuming little energy and other essential nutrients, or using or excreting them more rapidly than they can be replaced.

Currently Nigeria is one of the African countries listed among the 20 countries responsible for 80% of global malnutrition. In absolute terms, the number of estimated undernourished under-5 children in Nigeria is 9.5 million stunted, seven million underweight and this outstrips the entire populations in a few Sub-Saharan Africa countries. Thus, if this situation and circumstance could affirmatively describe the general pathetic scenario of Nigerian children, then there is a need to begin to generate specific data at various county levels that will drive the interest of policy makers in addressing integrated management of severe acute malnutrition, especially in each state or regions where prevalence rates are perceived higher, through synergy and proper management intervention programme that can save lives of these children. Therefore, this study specifically presents circumstantial condition of under-5 children malnutrition status of Borno and Kano States ravage by unabated insurgent activities as a pragmatic evidence for the eastern and western geo-political zones of Northern region respectively.

In this study anthropometric parameter is used for data gathering and analysis of malnutrition of children between the ages of 6-59 months. The result is compared with international standard of 5% described as an alarming rate. Anthropometric is the study and technique of human body measurement. It is used to measure and monitor the nutritional status of an individual or population group (Saul 2007) and University of Gent (2012). The procedure is simple, and regarded as valuable in assessing nutritional status of children and is devoid of any complexities. It is quick, does not require trained medical personnel or apparatus and is generally less liable to sudden variations than biochemical estimations. Bilateral pitting oedema and Mid-upper arm circumference (MUAC) are simple anthropometric tools used in the data gathered and analyzed in this study.

Gatchell *et al* (2004), Collins (2006) and Columbia University (2012) describe bilateral pitting oedema as a clinical manifestation of acute malnutrition caused by an abnormal infiltration

and excess accumulation of serous fluid in connective tissue or in a serious cavity. Bilateral pitting oedema (also called kwashiorkor) is verified when thumb pressure applied on top of both feet for three seconds leaves a pit (indentation) in the foot after the thumb is lifted. The pit will remain in both feet for several seconds. Bilateral pitting oedema usually starts in the feet and ankles. It is important to test both feet; if the pitting is not bilateral, the oedema is not of nutritional origin. Consequently, various levels of malnutrition operate within this age-cohort which often enhances vulnerability of children to different kinds of infections and disease.For instance,severe acute malnutrition (SAM) is conceptualized as the presence of bilateral pitting *oedema* or severe wasting(Diop, 2003) and International Food Research (2015). A child with SAM is highly susceptible and has a high mortality risk. SAM can also be used as a population-based indicator defined by the prevalence of bilateral pitting oedema and severe wasting indicator using the World Health Organization (2000), Caulfield *et al* (2004), The Sphere Project (2004) standards and Minnesota Population Center (2014).In this regard, this study attemts to examine the nutritional status of children under 5 years old in Borno and Kano States of Nigeria.

The Study Areas

Kano State is located in Northern Nigeria between latitude 10^0 25'N and 12^0 40'N and longitude 07^0 50'E and 09^0 10'E.Created on May 27, 1967 from part of the Northern Region, borders by Katsina State to the north-west, Jigawa State to the north-east, Bauchi State to the south-east and Kaduna State to the south-west. The capital of Kano State is Kano. The state originally included Jigawa State which was made a separate state in 1991. According to National Bureau of Statistics (2013) Kano State has 44 Local Government Areas with a total population of 10,727,888, the males constitute 52.6% and females 47.4% with 6.7% population growth rate, while Borno State is located in north-eastern Nigeria between latitude 09^0 59'N and 13^0 10'N,and longitude 11^0 15'E and14^0 17'E. The State was formed in 1976 from the split of the North-Eastern State, borders Republic of Niger and Yobe State to the north-west, Cameroun Republic to north-east, Gombe State to south-west and Adamawa State to south-east. It has 21 Local Government Areas with a total population of 4,778,758, the males constitute 52% and females 48% with 3% population growth rate (NBS, 2013). The geographical location of these States is shown in Figure 2.

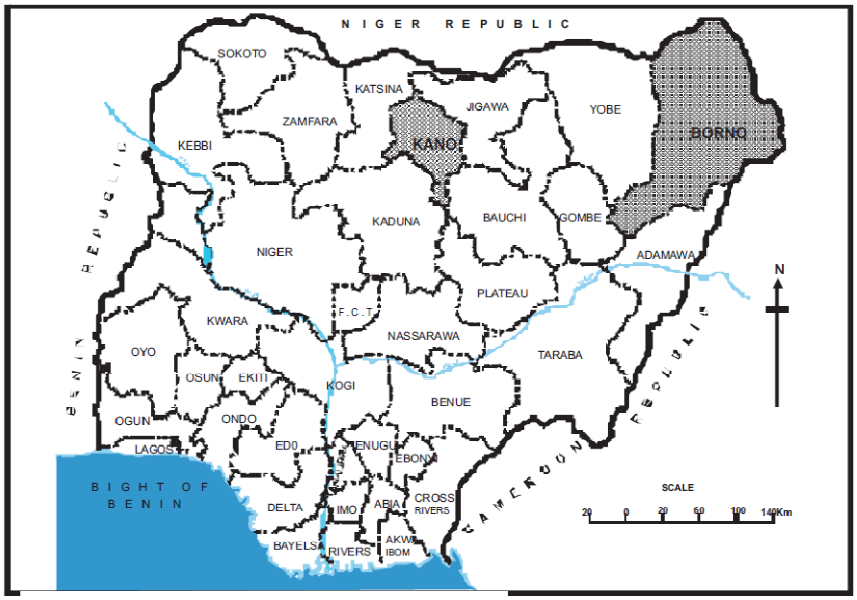

Figure 2. Nigeria showing Borno and Kano States
Source: Geography Department NDA, Kaduna, 2009

Materials and Methods

The data used for this study were generated through anthropogenic parameters survey. In this regard, a total number of 4,680 children were assessed from 430 households in the States of Borno and Kano. Specifically, Mid-Upper Arm Circumference (MUAU) of children was measured because it is a good indicator of muscle mass and proxy of wasting. It is also a very good predictor of the risk of death. For instances, Young *et al* (2006) and Valid International (2006) emphasized that MUAC is mainly measured on children aged 6 to 59 months old of ≤ 11.0cm is recommended as a criterion of admission to therapeutic feeding programmes. It is particularly recommended for the detection of severe malnourished within this age range at community-level (Woodruff and Duffield, 2000). However, according to WHO *et al* (2006) there is no agreement for the measurement and interpretation of MUAC values in children less than 6 months and in adults. Thus, MUAC is mainly used for detecting individuals in need of treatment rather than for measuring population trend data.

Figure 1 shows the MUAC tape and its grades as follows Red-colour is MUAC < 11.0 cm refers to Severe Acute Malnutrition (SAM) and/or bilateral pitting oedema, the Yellow-colour on the other hand ranges from MUAC > 11.0 cm and < 12.5 cm depicts Moderate Acute Malnutrition (MAM) while Green-colour is normal MUAC > 12.5 cm.

Fig. 1 Mid-Upper Arm Circumference Tape

The main sampling frame for this study is Borno and Kano states in northern Nigeria. They were purposively selected because of their strategic location. Kano state is the commercial nerve centreof the northern region, while Borno State is situated at the border in the North East of Nigeria, and both have socio-cultural challenges of national and global implications.

The survey was cross-sectional using both quantitative and qualitative techniques in the selection of three LGAs and three political wards from each of the states. Households at the community level were randomly selected for the examination of eligible children that fall within the expected age-group.

SAM prevalence rates for each Ward, LGA and State were collated and calculated using the following steps:

Determine the number of children with *Oedema* = A

Determine the number of children with MUAC ≤ 11.0 cm but without *Oedema*= B

$$\text{Prevalence of Severe Acute Malnutrition (\%)} = \frac{A + B}{\text{Total No of Children Assessed}} \times 100$$

Results and Discussion

A total number of 4,680 children were assessed in 4301 households in the two states. Out of these 49.9% were males and 50.1% females. The data analyzed showed that Severe Acute Malnutrition (SAM) prevalence value ranged from 9.6% in Maiduguri Municipal Council of Borno State to 17.2% in Bichi LGA, of Kano State. Other assessed LGAs in Borno State have prevalence rate of 9.6% in Maiduguri Municipal Council (MMC) and 12.8% in Monguno LGA, while in Kano state, Wudil has 15.4% and Kano Municipal Council with 13.2%. Analysis of sex disaggregation indicate, Female has the highest value of 15.3% in Biu LGA of Borno state, while male counterpart has the highest value of 11.1% in Bichi LGA of Kano. These percentages are shown in Table 1.

Figure 3 shows overall prevalence rate of severe acute malnutrition of the states under investigation, which illustrates that girl-child are more malnourished in the states. Furthermore, a critical comparative analysis of Table 1 and Figure 3 indicates that in all the LGAs assessed, it is only in Bichi and Wudil LGAs that the male-children are more malnourished than the female.

These results further show that in Borno and Kano States, under-5 children nutritional condition is at an alarming situation as it has surpassed 5% international standard for describing children suffering from malnutrition. Therefore, children in Borno and Kano states are all severely and acutely malnourished. The implication of this scenario is high infant mortality rate as a result of their susceptibility to diseases and outbreak of epidemics in the two states considered in this study.

Table 1: Nutritional Status of under-5 children in Borno and Kano States

State	Local Government Areas	Total No of House Hold Covered	No of Children Assessed		No of Children with Bilateral Pitting *Oedema*		No of Children with MUAC ≤11.0cm		SAM Prevalence Classification (%)		LGA Overall SAM Prevalence (%)
			M	F	M	F	M	F	M	F	
Borno	Biu	695	362	378	25	37	15	21	11.1	15.3	12.6
	Maiduguri Municpal Council	707	460	460	22	29	14	23	7.8	11.3	9.6
	Monguno	651	372	366	19	28	13	19	8.6	12.8	10.7
Kano	Bichi	743	370	370	33	27	36	31	18.6	15.7	17.2
	Kano Maiduguri Council	1044	489	493	28	26	33	39	12.5	13.2	12.8
	Wudil	461	280	280	24	23	27	20	18.2	15.4	16.8
Total		**4301**	**2333**	**2347**	**151**	**170**	**138**	**153**	**12.4**	**13.8**	**13.1**

Source: Authors' Fieldwork 2016

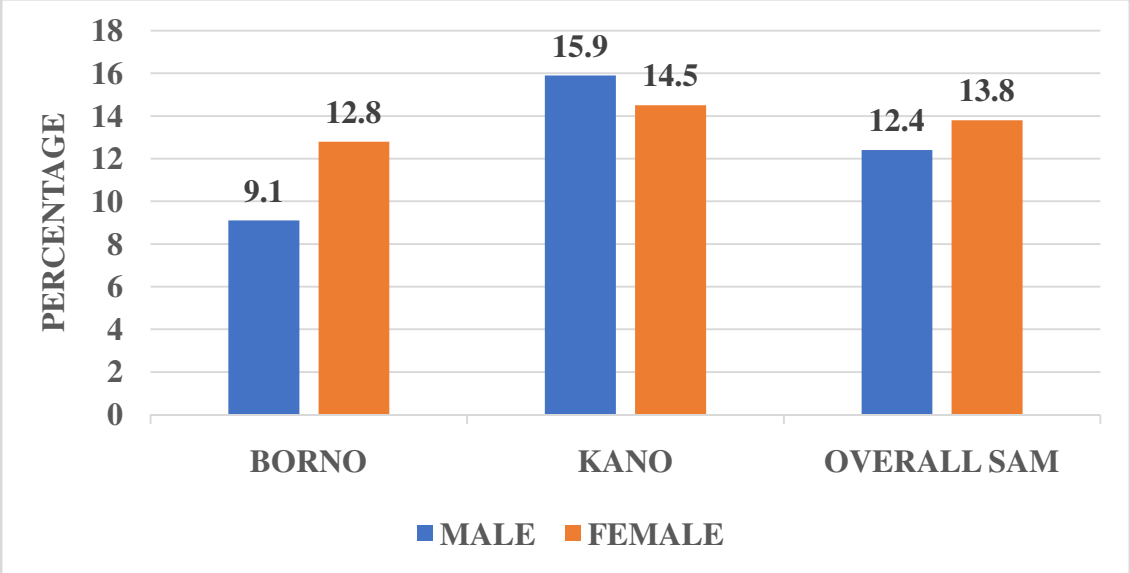

Figure 3: Severe Acute Malnutrition in Borno and Kano States
Source: Authors' Fieldwork 2016

The assessment further revealed that the vulnerability of the female child to SAM is higher than the male child in Borno state. This is worrisome as socio-cultural milieu of the area tends to give preference to girl-child over the boys and also, the demand for food intake of girl-child tends to be less compared to the boy-child. This support the NPC and UNICEF (2001) fact that women who were stunted as a result of starvation in childhood are more prone to have low births-weight babies at adulthood. This could explain the proliferation of high maternal and infant mortality rate in Northern Nigeria

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The survey also revealed that SAM prevalence among children 6-59 months is higher in rural communities than in urban communities. The study also, observed that wards especially in Biu, and Bichi LGAs with the highest value of SAM experienced recent outbreak of measles, fever, vomiting, diarrhea and poor environmental sanitation. Also, about 10% of the assessed children are semi-orphan due to complication related cases from delivery and postpartum.

This trend may be as a result of gross inadequate access to health facilities, poor key household practices, household food insecurity, diseases, and socio-cultural factors and ultimately the general pandemic nature of poverty phenomena in the states. More often than not, are usually the children first victims. The children nutrition status can be linked to wide-ranging poverty scenario in the States and socio-cultural inclination of the people in the region. This is in accordance with other findings byQuabasiyu (2008) which revealed that "70% of children in the Northeast are not immunized; over 260 cases of Polio prevalence in Nigeria are from the north, 19% of Under-5 children have malaria; 15% with diarrhea, 62% of children, most of whom are girls not attending school and 60% of rural people bring up children in homes with no access to safe water or sanitation". The under-five malnutrition scenario in the Northeast of Nigeria reiterate her neighboring country of the Republic of Niger where there are 47% stunted, 36% underweight, 12% wasted and 27% of infants are born with a low birth weight. (United Nations, 2015).

The aforementioned situation is unacceptable for any meaningful plan for inter-generational sustainability. It is worth to underscore that under-five children survival, growth and development depends mainly on nutritional quality and quantity intake, it is within the first five years of life, cognitive and vital organs of body are formed. For emphasizes these early 59 months are when experiences and interactions with parents, family members and other adults influence the way a child's brain develops, with as much impact as such factors as adequate nutrition, good health and clean water. Child development during this period sets the stage for later success in school and the character of adolescence and adulthood. When children are held and touched in soothing ways, they tend to thrive. Warm responsive care seems to have a protective function, to some extent immunizing an infant against the effects of stress experienced later in life. But the brain's malleability during these early years also means that when children do not get the care they need, or if they experience starvation, abuse, or neglect, their brain development may be impaired.

The effects of what happens during the earliest months and years of a child's life can last a lifetime. All the key ingredients of emotional intelligence, confidence, curiosity, intentionality, self-control, relatedness, capacity to communicate and cooperativeness that determine how a child learns and relates in life in general depend on the kind of early care he or she receives from parents and society. It is of course never too late for children to improve in their health and development, to learn new skills, overcome fears or change their beliefs. But, as is more often the case, when children do not get the right start, they never catch up to reach their full potential.

Observations, shows that this region suffered from chronic malnutrition, due to food insecurity owing majorly to frequent Boko Haram attacks through killing, incessant knapping of strata members of the society, robbery. Part of the aftermath effects of these insurgent activities is the unprecedented displacement of persons which have created environmental degradation, deterioration of

nutrition status include water, shelter, food access and storages.

Conclusion

In conclusion, persistent malnutrition from this region (northern Nigeria) contributed to Nigeria's failure to meet benchmark of Millennium Development Goals: 1, 4, 5, and currently threatening Sustainable Development Goals: 1, 2 and 3. Evidently, insufficient result-oriented framework on issues of children as it relates to: nutritional diet/intake, behavioral change communication and necessary capacity for efficient and effective service delivery for caregivers, non-intensification of nutritional determinants to mitigate maternal mortality rate. These identified gaps explained the existence of millions of malnourished children in the two states considered in the study. These, also led to high prevalence rate of killer diseases that are preventable in this region when compared to other geopolitical regions of Nigeria. To address this unacceptable nutritional scenario of under-5 children, the unprecedented security challenge must be urgently tackled strategically and holistically by the northern stakeholders through urgently working-out de-radicalization of religious issues,stoppage of lackadaisical attitudes of lip services, decline political coloration, and hide-to-self-pity syndrometowards Boko Haram. Addressing security challenge will engendered the following: access to meaningful pragmatic intervention especially from International Development Partners;enabling intervention and implementation of community therapeutic care for integrated management of severe acute malnutrition;poverty reducing through revamping farming activities of the community people;accessible, affordable, and acceptable primary health clinics could be established at the community level for quality service delivery to the people; accentuation of training of the people on trauma advisers, building supportive institutions and structures for war time economy of victims and vulnerable communities in these states and perhaps entire geo-political region if the lives of children within this age-cohort will not be compromised.

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